Appendix B

Effect Determination
Section 106, National Historic Preservation Act

Letter from Federal Highway Administration to

State Historic Preservation Officer

November 26, 2013

U.S.Department of Transportation
Federal Highway Administration

Hawaii Federal-Aid Division

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

November 26, 2013

In Reply Refer To:
HDA-HI

Mr. William J. Aila, Jr.
Chairperson and State Historic Preservation Officer
Hawai'i Department of Land and Natural Resources
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707

Subject: National Historic Preservation Act Section 106 Effect Determination
Lydgate Park-Kapa'a Bike/Pedestrian Path, Phases C & D
Kawaihau District, Kaua'i, Ahupuaa of South Olohena, North Olohena, and Waipouli
Federal-aid Project No. CMAQ-0700(49)
Tax Map Keys: [4] 4-3-001, 002, and 007: Various

Dear Mr. Aila:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006), the Federal Highway Administration (FHWA) requests the State Historic Preservation Officer's concurrence on the effect determination for the proposed improvements. The FHWA is rendering a no adverse effect determination for the subject project.

This determination is based on realignment of the path to avoid a burial found during the archaeological inventory survey and other mitigation commitments. Documentation of the Section 106 process indicates preliminary assessments of adverse effect for some historic properties. However, additional project planning and discussions with consulted parties resulted in a modified undertaking that avoids direct harm to historic properties.

The FHWA intends to provide funds for the proposed improvements. Therefore, the FHWA has required the State of Hawai'i Department of Transportation (HDOT) and the County of Kaua'i to comply with the National Environmental Policy Act (NEPA), NHPA, and other federal requirements. The FHWA has authorized the HDOT, County of Kaua'i, and Kimura International, Inc. to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation.

Overview of the Undertaking

Project Background and Purpose

In 2007, the Kaua'i Department of Public Works (DPW) completed an environmental assessment (EA) for a bike/pedestrian path from Lydgate Park to Kapa'a (Lihi Park). This EA was prepared pursuant to Hawai'i Revised Statutes (HRS) 343 and the NEPA and made a finding of no significant impact. The preferred alignment included a section located mauka of Kūhiō

Highway and along the Waipouli drainage canal (shown in Figure 1 as Phase E). After the EA was completed, more detailed design studies determined that crossing Kūhiō Highway and the temporary bypass road would not be optimal for path users. Instead, because the bike/pedestrian path would extend as far north as Coconut Marketplace (via the Papaloa Road spur) and as far south as Uhelekawawa Canal, the county began reexamining options to connect these two points. The most feasible option is a makai route that had been proposed and studied in the draft EA for the original path project—to locate the path within portions of the county's existing beach reserve.

A new EA is being conducted pursuant to HRS 343 to reevaluate the "makai alternative," referred to as phases C and D or the "Waipouli connection." This section of the bike/pedestrian path will measure approximately 6,100 to 6,500 feet, depending on the final alignment.

The purpose of the project is to provide a safe and inviting facility that will expand opportunities for non-motorized travel and outdoor recreation; establish a clear travel way for lateral coastal access; and provide connectivity to shopping, dining, and resort areas.

Project Corridor

The undertaking is located in the Kawaihau District on the island of Kaua'i. The south end of the project corridor is located on Papaloa Road between the Kaua'i Sands Hotel and the Coconut Marketplace. The north end is located at a Kūhiō Highway bridge crossing Uhelekawawa Canal (see Figure 2). Existing shared use paths terminate at these two locations.

Project Location

Figure 2 shows the project location. The EA will evaluate a project alignment that extends makai from Papaloa Road between Kaua'i Sands Hotel and Islander on the Beach, then north through the County's beach reserve and along the coastal bench fronting three undeveloped parcels and Courtyard Kaua'i at Coconut Beach. The path would turn mauka just south of Mokihana of Kaua'i, following an existing county beach access.

The preferred alternative jogs between Mokihana of Kaua'i and the Village Manor condominiums, then continues along the southern bank of Uhelekawawa Canal (currently a landscaped strip) to Kūhiō Highway.

An alternative alignment is to use the existing beach access south of Mokihana of Kaua'i, then construct a bike/pedestrian corridor along the makai side of Kūhiō Highway north to Uhelekawawa Canal (approximately 580 feet). (See Figure 2, the alternative alignment is shown as a green dashed line.)

A stream crossing will be needed at Uhelekawawa Canal, but the crossing will not require work in the water. The bicycle and pedestrian bridge is expected to be a cantilevered attachment to the existing highway bridge or an independent, single-span bridge that will connect to the existing bike path at Waipouli Beach Resort.

Improvements are also proposed for the county parking lot located behind Kapa'a Missionary Church. This site is proposed as a trailhead with a comfort station, drinking fountain, and parking.

Area of Potential Effects

The area of potential effects (APE) is shown in the enclosed Figure 3. The initial APE was drawn as an approximate 50-foot corridor encompassing the preliminary alignment. Because the final path alignment will not be determined until the design phase of the project, a preliminary alignment is shown in the accompanying figures for planning purpose. This alignment is based on county easements (for the mauka-makai sections), the boundary of the county beach reserve adjoining the Islander on the Beach and Kaua'i Coast Resort properties, drawings provided by the developer of the future Coconut Beach Resort, drawings attached to the Special Management Area (SMA) application by the developer of the future Coconut Plantation Resort, and drawings provided by Mokihana of Kaua'i.

The APE and preliminary alignment were used to determine subsurface testing locations for the archaeological inventory survey. The APE's coverage reflects a balance between identifying historic properties over a sufficiently broad area, and the desire of many consulted parties to limit excavations to areas of direct potential impact, rather than "look for the needle in the haystack."

Project Description

Consistent with the overall design of Ke Ala Hele Makalae, the bike/pedestrian path will be 10 to 12 feet wide and allow movement in both directions. It is intended to accommodate a wide variety of users; however, motorized vehicles will not be allowed with the exception of motorized wheelchairs, emergency vehicles, and maintenance vehicles. The path will be constructed from concrete with graded shoulders. Under some environmental conditions, the path's design and construction materials may vary in response to context sensitivity. For example, in areas known to have concentrations of subsurface cultural deposits, the path will be constructed on a slight berm to minimize excavation.

The project includes rehabilitation, and possible expansion, of the existing county parking area behind Kapa'a Missionary Church. A small comfort station is planned within the parking lot, which can be tied in to a sewer line nearby.

Because the path will traverse developed areas, it may be necessary to relocate and/or replace existing facilities or vegetation—notably coconut trees on the south bank of Uhelekawawa Canal. Other construction and design elements include grading, walls, railings, fencing, landscaping, signage, and amenities, such as trash receptacles, benches, and water fountains. In general, the path facility will not have exterior lights. If lights are needed at the comfort station for safety or security, shielded fixtures will be used. Decisions about specific features will be made during the project's design phase.

Consultation Overview

The HDOT sent a memorandum to your office on February 9, 2012, to initiate the Section 106 process. A response was requested to acknowledge your interest in participating in the undertaking as a consulted party. No response was received. However, notification letters were sent to your office prior to each of the five public meetings.

Section 106 consultation letters, dated February 24, 2012, were sent to the organizations and individuals shown in the mailing list (in Volume 1 of the enclosures).

Mailing List

The initial Section 106 outreach letter was sent by the HDOT on February 24, 2012, to Native Hawaiian organizations (NHOs) and other potentially interested parties who were included on a mailing list developed for short-term transportation improvements in the Wailua area. A Preparation and Protocol Committee meeting was held in July 2012, during which committee members recommended the addition of all Kaua'i kumu hula to the mailing list. Names and contact information for the kumu hula were provided by the Office of Hawaiian Affairs. The mailing list grew to include participants who attended the public Section 106 meetings. In a few cases, names were deleted from the mailing list in response to specific requests for removal. The mailing list is used to provide notice of upcoming meeting dates and distribute meeting minutes.

Section 106 Process Time Line

The following table shows the actions taken in the Section 106 consultation process.

Supporting documentation, including full minutes of the Section 106 meetings, may be found in the appendices (see notes column). Comments from the Section 106 consulting parties are summarized in the Meeting Summaries (see enclosed document).

Action	Date	Notes
36 CFR §800.3 Initiation of the Section 106 Process		
Letter from John D. Nickelson, FHWA to William J. Aila, Jr., SHPO	October 28, 2011	See Appendix A
Memorandum from Glenn M. Okimoto, HDOT to Pua Alaokalani Aiu, SHPD	February 9, 2012	See Appendix A
Preparation and Protocol Committee meeting	May 30, 2012	
Native Hawaiian caucus	July 5, 2012	See Appendix B
Public meeting 1 Walking tour	August 9, 2012	Legal notice published in *The Garden Island* on July 26, 2012 Consulted party attendance: 30 See Appendix C
36 CFR §800.4 Identification of Historic Properties		
Public meeting 2	August 23, 2012	Legal notice published in *The Garden Island* on July 26, 2012 Consulted party attendance: 19 See Appendix D
Kaua'i Historic Preservation Review Commission presentation	October 4, 2012	
Public meeting 3	November 27, 2012	Legal notice published in *The Garden Island* on July 26, 2012 Consulted party attendance: 10

Action	Date	Notes
		See Appendix E
36 CFR §800.5 Assessment of Adverse Effects		
Public meeting 4	February 20, 2013	Legal notice published in *The Garden Island* on February 7, 2013 Consulted party attendance: 10 See Appendix F
36 CFR §800.6 Resolution of Adverse Effects		
Public meeting 4	February 20, 2013	Legal notice published in *The Garden Island* on February 7, 2013 Consulted party attendance: 10 See Appendix F
Public meeting 5	May 20, 2013	Legal notice published in *The Garden Island* on May 13, 2013 Consulted party attendance: 7 See Appendix G
36 CFR §800.7 Coordination with the National Environmental Policy Act (NEPA)		
Documented Categorical Exclusion (NEPA) and Draft Environmental Assessment (Chapter 343, HRS) being prepared	Pending	
Public information meeting to be held during the DEA public review period	Not yet scheduled	

Ho'oponopono Process

The Native Hawaiian Preparation and Protocol Committee adopted the ho'oponopono process as a way to make Section 106 consultations more accessible to the Native Hawaiian community. The ho'oponopono process is structured around a kulukulu kumuhana (statement of problem to be solved), which, in this case, is to conduct consultations for the purpose of informing the FHWA decisions on historic properties potentially affected by the undertaking.

Historical, Cultural, and Archaeological Background

Archaeological Assessment

A report titled *Archaeological Assessment of Alternative Routes Proposed for the Lydgate to Kapa'a Bike and Pedestrian Pathway Project within the Ahupua'a of Wailua, South Olohena, North Olohena, Waipouli, and Kapa'a, Island of Kaua'i,* April 2004, was prepared by Hallett H. Hammatt and David Shideler of Cultural Surveys Hawai'i for the original project (see Appendix I).

Cultural Impact Assessment

The cultural impact assessment is not required under the NEPA, but is prescribed under Chapter 343, HRS. A cultural impact assessment was conducted by Cultural Surveys Hawai'i. Findings are presented in a report titled *Cultural Impact Assessment for Lydgate Park-Kapa'a Bike & Pedestrian Path, Phases C&D, CMAQ-0700(49), South Olohena, North Olohena and Waipouli*

Ahupua'a, Kawaihau District, Kaua'i Island, TMK: [4] 4-3-001, 002, and 007: Various, prepared by Kūhiō Vogeler, Margaret Magat, and Hallett H. Hammatt, January 2012 (see Appendix J). The report was made available to Section 106 consulted parties through a web link.

Archaeological Inventory Survey

After the Section 106 process was initiated, an archaeological inventory survey (AIS) was conducted to provide consulted parties with additional information about historic properties within the APE. The findings were presented in a report titled *Draft Archaeological Inventory Survey Report for the Lydgate-Kapa'a Bike and Pedestrian Path Project, Phases C and D, CMAQ-0700(49), South Olohena, North Olohena, and Waipouli Ahupua'a, Kawaihau District, Island of Kaua'i, TMK: [4] 4-3-001, 002, and 007: Various prepared by Kelly L. Burke and Hallett H. Hammatt, October 2012* (see Appendix K). The report was made available to consulted parties through a web link. Printed copies were made available at the Kapa'a Library, Lihu'ē Library, and the Office of Hawaiian Affair's Kaua'i office. The report was submitted to the SHPD for review on October 30, 2012.

The subsurface testing program included the excavation of 58 test units (48 small shovel tests and 10 larger test trenches).

The project area's subsurface deposits were found to be fairly undisturbed. In most cases, only landscaping and grading fill had disturbed, partially removed, or been placed on top of the natural sandy loam or sand sediments, much of which has been related to resort development along the coast. Buried, pre-Contact A horizons were evident in many of the test units. In general, the observed and documented stratigraphy consisted of the following sequence (starting with the topmost layer): (1) grass, organic matter, or asphalt, (2) various fill layers, such as landscaping and grading fill, (3) a sandy, buried A horizon, and (4) natural Jaucus sand. In some instances, layers of wind-deposited or high surf-deposited natural sand were observed.

The majority of documented, buried A horizons encountered within the project area contained cultural material. This included charcoal, shell midden, fire-cracked rock, basalt flakes, coral, and one human burial. This cultural layer was designated into three separate SIHP numbers based on pre-existing historic properties and locations: SIHP No. 50-30-08-791, 50-30-08-1800, and 50-30-08-1801. Due to the lack of discrete features, appropriate samples for carbon dating were not recovered.

Two new historic properties were documented within the project area during the AIS investigations, both believed to be traditional Hawaiian burials.

The AIS findings were consistent with findings reported in previous archaeological investigations, which observed cultural layers suggestive of long occupation spanning several centuries and a range of activities along the coastline in this area.

Summary of Archaeological Sites within the APE

The following table summarizes key elements of eleven historic properties were identified within the APE (see Figure 7).

Site Name and/or SIHP Number	Brief Description	Integrity/Condition	Location/Distance from Project Area	Eligible or Potentially Eligible for Listing in National Register (NR) or Hawaii Register (HR) and Valuation of Significance
SIHP 50-30-08-108 Kukui Heiau	Navigational heiau with at least two stone lamps that guided canoes on the ocean	Good condition, well maintained	South Olohena Ahupua'a, Alakukui Point, located about 300 feet southwest of the project area South Olohena Ahupua'a, Alakukui Point, located about 300 feet southwest of the project area	Placed on Hawaii Register in 1986 and the National Register in 1987 Placed on Hawaii Register in 1986 and the National Register in 1987
SIHP 50-30-08-791 Cultural layer and burials	Cultural layer with relatively high concentration of marine midden suggestive of substantial fishing activity; radiocarbon dating to A.D. 1275 to 1645; two burials	The cultural layer is mainly extant in makai or eastern portion of property	South Olohena Ahupua'a, northeast coast; cultural layer extends into the project area	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR
SIHP 50-30-08-886 Cultural layer and burials	Cultural layer with hearth remnant, 'auwai, and two sets of previously disturbed disarticulated human remains (SIHP 50-30-08-886A)	Cultural layer intact, continuous. Burial condition unknown	Waipouli Ahupua'a, along Kūhiō Highway near Coconut Market Place; cultural layer is located within the project area	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR
SIHP 50-30-08-891 WWII pillbox	Concrete WWII-era military structure, likely a military pillbox or machine gun emplacement	Unknown	North Olohena Ahupua'a, southeast corner of Lot 16 on the coast, located within the project area	Yes D (information) for NR D (information) for HR
SIHP 50-30-08-1800 Cultural layer and burials	Two cultural layers in the shoreline sand berm; an upper deposit extends 25-80 feet inland from the shore; a lower deposit extends 40-100 feet inland from the shore; three burials uncovered and left in place; probably occupied about A.D. 1500; the extensive nature of deposits and	Cultural layer continuous and intact	North Olohena Ahupua'a, northeast coast, Coconut Plantation; cultural layer extends into the project area	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR

Site Name and/or SIHP Number	Brief Description	Integrity/Condition	Location/Distance from Project Area	Eligible or Potentially Eligible for Listing in National Register (NR) or Hawaii Register (HR) and Valuation of Significance
	relative lack of artifacts suggests that the area was used for recreation or social gatherings			
SIHP 50-30-08-1801 Cultural layers and burials	Two cultural layers and five burials are located in the shoreline sand berm; radiocarbon dated to approx. A.D. 1500; numerous indigenous artifacts suggest a development sequence from a limited workshop area to a site of permanent occupation	Cultural layer continuous and intact. Condition of burials is unknown	Waipouli Ahupua'a, Coconut Plantation, 200 meters makai of Kūhiō Highway; cultural layer extends into the project area	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR
SIHP 50-30-08-1836 Cultural layer and burials	Cultural layer with numerous features. Data suggest this site was a moderate permanent settlement that may have been a staging area for fishing events and associated feasting and religious activities, a location for canoe construction, repair, and storage, a location for manufacture of shell tools and slingstone, and special place for tattooing	Cultural layer continuous and intact. Condition of burials is unknown	Waipouli Ahupua'a, from coast to Kūhiōō Highway, located north of Uhelekawawa Canal (Waipouli Beach Resort)	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR
SIHP # 50-30-08-3938, cultural layer	A pit feature with charcoal and fire-cracked rocks was recorded. The radiocarbon dating result for this feature, dated to AD 1690-1775, was first reported in a subsequent monitoring report for the property	Unknown	Beach portion in Waipouli and North Olohena Ahupua'a	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR
SIHP # 50-30-08-3939, two Hawaiian burials	Two pre-Contact/early historic Hawaiian burials	Unknown	Beach portion in Waipouli and North Olohena Ahupua'a	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR

Site Name and/or SIHP Number	Brief Description	Integrity/Condition	Location/Distance from Project Area	Eligible or Potentially Eligible for Listing in National Register (NR) or Hawaii Register (HR) and Valuation of Significance
Burial 1, SIHP To be determined	Likely pre-Contact to early post-Contact in age	Well-maintained, intact	Within County beach access, near Mokihana of Kaua'i tennis court	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR
Burial 2, SIHP to be determined	A previously disturbed human burial located adjacent to an old utility line. A partial, disturbed burial pit was also observed. This burial is likely pre-Contact to early post-Contact	Partially disturbed	Within landscaped area off Papaloa Road and south of Coconut Market Place	Yes D (information) for NR D (information) and E (cultural traditional significance) for HR

Summary of Effects

SIHP No.	TMK	Type of Historic Property	Adverse Effect	No Adverse Effect with Mitigation Commitments	No Effect
50-30-08-108	4-3-002:010	Heiau			x
50-30-08-791	4-3-002:014	Cultural layer		x	
50-30-08-886	Kūhiō Hwy	Cultural layer, burials		x	
50-30-08-891	4-3-007:016	WWII pillbox			x
50-30-08-1800	4-3-007:016	Cultural layer, burials		x	
50-30-08-1801	4-3-007:027	Cultural layer, burials		x	
50-30-08-1836	4-3-008:018	Cultural layer, burials			x
50-30-08-3938	4-3-007:008 and 007	Cultural layer		x	
50-30-08-3939	4-3-007:008	Burials			x
50-30-08-	4-3-007:026	Burial		x	
50-30-08-	4-3-002:012	Burial			x

Other Properties Mentioned by Section 106 Consulted Parties

Footpath through Ironwoods (TMK: 4-3-007:027)
The Kaua'i Group of the Hawai'i Chapter of the Sierra Club (letter dated April 4, 2012, and comments by Rayne Regush, Public Meetings 4 and 5) stated that the mature ironwood trees along the coast and the footpath through them are important to the historic characteristic of the area and need to be retained to preserve the historic, scenic, and cultural qualities of the area.

In response, Hal Hammatt, Cultural Surveys Hawai'i, commented that the trail has no visible structural elements except as a worn path through the ironwoods. As a "route," the footpath is more than 50 years old, as is nearly any path parallel to the shoreline. The ironwoods are modern introductions. In his opinion, these elements would not qualify as a historic property under the present criteria. The footpath may be an element of the cultural landscape, although the property is slated for resort development, which is expected to change the contextual environmental. To the extent feasible, the bike/pedestrian will seek to incorporate the existing footpath.

Entire Project Area (Waipouli Coast) as a Whole
Several consulted parties commented that the area as a whole is historically and culturally significant, and that a shared use path would be inconsistent with the sacredness of the area. Other consulted parties commented that while the area's historical significance remains important, the physical environment is dominated by modern resort development that has already diminished the historical context. They also noted that future resort development on the infill properties would intensify the urban character and further inhibit public access to coastal locations; referencing, for example, the boulders marking the Courtyard Kaua'i property (see Photo7).

Effect Determination

Based on our analysis, site observations, and consultation with NHOs and other interested parties, the FHWA has determined the project will have no adverse effect on historic properties.

Phases C & D of the Lydgate Park to Kapa'a bike/pedestrian path traverses the coastal portion of the ahupua'a of South Olohena, North Olohena, and Waipouli. Archaeological resources found in the project corridor indicate an area of long occupation and the occurrence of a wide range of coastal activities.

Project construction is expected to have a limited potential for adverse effect on subsurface resources. With the exception of the comfort station, excavation requirements will be relatively shallow—the path itself typically involves excavation to a maximum depth of one foot. To further reduce the potential for construction impacts, project designers will examine options to construct the path on a berm or fill in areas where concentrations of subsurface deposits have been found. To mitigate any potential damage to known (documented) or yet unidentified historic properties, project construction will proceed under an archaeological monitoring program. The monitoring program will facilitate the identification and proper treatment of any additional burials that might be discovered during project construction, and will gather additional information regarding the project's non-burial archaeological deposits, should any be discovered.

Burials have been found within seven properties located within the APE. Of these, the path alignment avoids all known burials sites. Burials identified during the AIS will be treated in accordance with a burial treatment plan to be prepared in compliance with Hawai'i Administrative Rules §13-300-33. To avoid an adverse effect on Burial 1, discovered between an existing concrete sidewalk and the tennis court at Mokihana of Kaua'i, the County is working to realign the path around the burial site.

Mitigation Policies

Mitigation measures during the construction of the proposed improvements have been and will continue to be implemented to avoid and minimize potential impacts to archaeological, cultural, and historic resources. The following mitigation measures have been or will be implemented, at a minimum:

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, Hawai'i Administrative Rules Title 13. Subtitle 13, Chapter 300 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and SHPD and Police Department will be contacted. The appropriate process would then proceed in conformance with Hawai'i Administrative Rules §13-300 Subchapter 4 "Procedures for Property Treatment of Burial Sites and Human Skeletal Remains."

The County of Kaua'i will prevent the disturbance or taking of any historic property or resource to the extent possible by instituting these mitigation measures and enforcing their implementation by contractors.

Summary of Site Specific Mitigation Measures

SIHP No.	TMK	Type of Historic Property	Mitigation Commitments
50-30-08-108	4-3-002:010	Heiau	Directional sign to keep flow of pedestrians and bicycles away from the heiau
50-30-08-791	4-3-002:014	Cultural layer	Archaeological and cultural monitoring plan Interpretive sign
50-30-08-886	Kūhiō Hwy	Cultural layer, burials	Archaeological and cultural monitoring plan
50-30-08-891	4-3-007:016	WWII pillbox	Interpretive sign
50-30-08-1800	4-3-007:016	Cultural layer, burials	Archaeological and cultural monitoring plan Path construction on a berm (fill) over area(s) of concentrated cultural deposits to minimize the need for subsurface excavation
50-30-08-1801	4-3-007:027	Cultural layer, burials	Archaeological and cultural monitoring plan Path construction on a berm (fill) over area(s) of concentrated cultural deposits to

SIHP No.	TMK	Type of Historic Property	Mitigation Commitments
			minimize the need for subsurface excavation Interpretive sign Path to follow the existing footpath where feasible
50-30-08-1836	4-3-008:018	Cultural layer, burials (Waipouli Beach Resort)	None
50-30-08-3938	4-3-007:008 and 007	Cultural layer	Archaeological and cultural monitoring plan
50-30-08-3939	4-3-007:008	Burials	None
50-30-08-	4-3-007:026	Burial 1 (north)	Burial treatment plan Realign path to avoid burial
50-30-08-	4-3-002:012	Burial 2 (south)	Burial treatment plan

Additional Proposed Mitigations that are Not Specific to Historic Properties

- Ethnographic study of the Waipouli coast
- Fencing, landscaping, and/or other barrier between path and adjacent residences
- Improvements to public parking for coastal access

If the SHPD objects to the adverse effect determination for the subject project, please inform us within 30 days of receipt of this letter. In the absence of a response by this date, the FHWA will assume SHPD concurrence with this determination and will proceed with the undertaking.

Please contact me at (808) 541-2316 or by email at meesa.otani@dot.gov if you have any questions. Thank you for your assistance.

Sincerely yours,

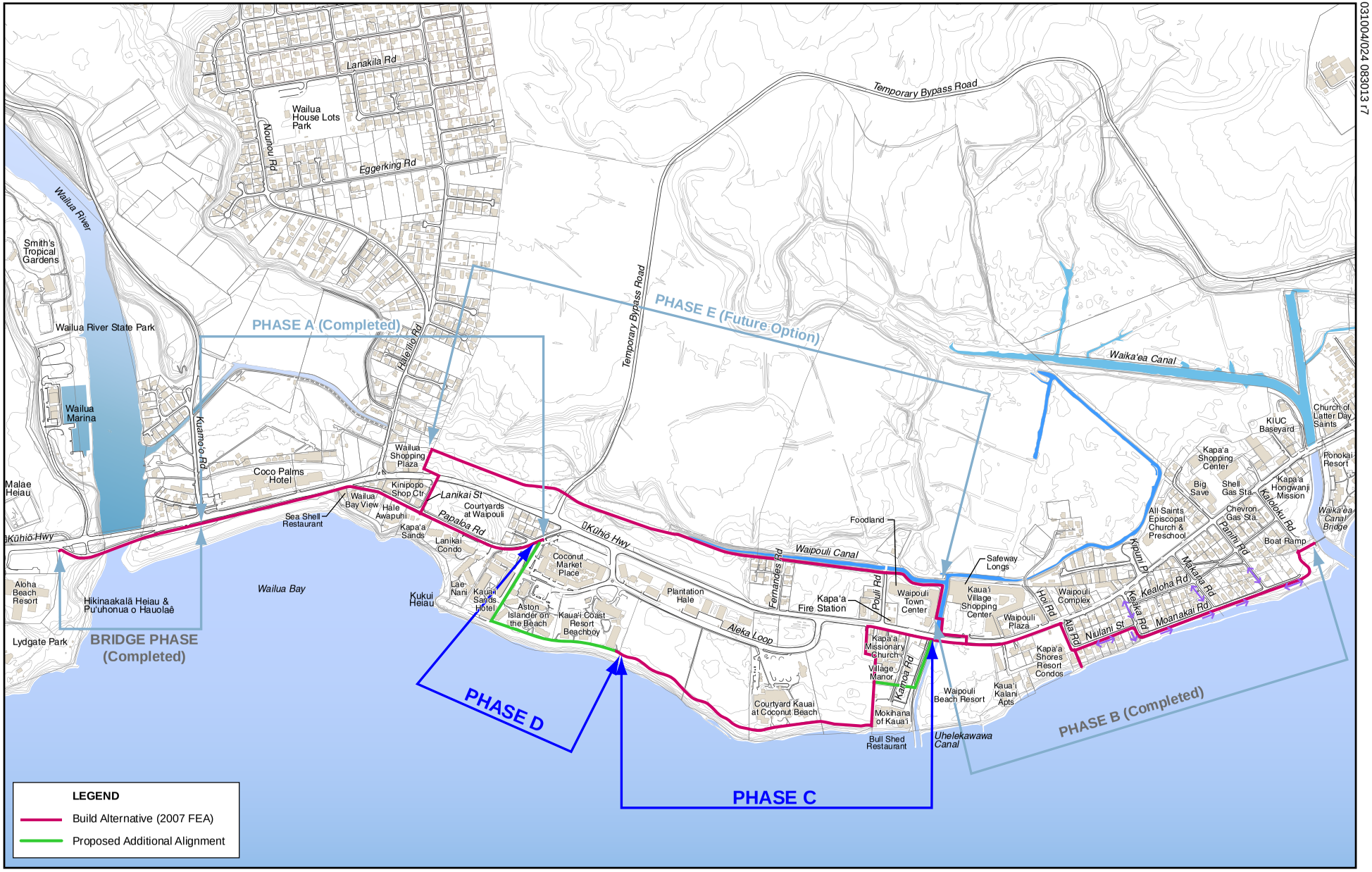
Meesa Otani

Meesa T. Otani
Environmental Engineer

Enclosures

cc: Douglas Haigh, Kaua'i Department of Public Works
Holly Yamauchi, HDOT
Todd Nishioka, HDOT
Glenn Kimura, Kimura International, Inc.
Section 106 consulted parties (see enclosed mailing list)

Lydgate Park - Kapa'a Bike/Pedestrian Path



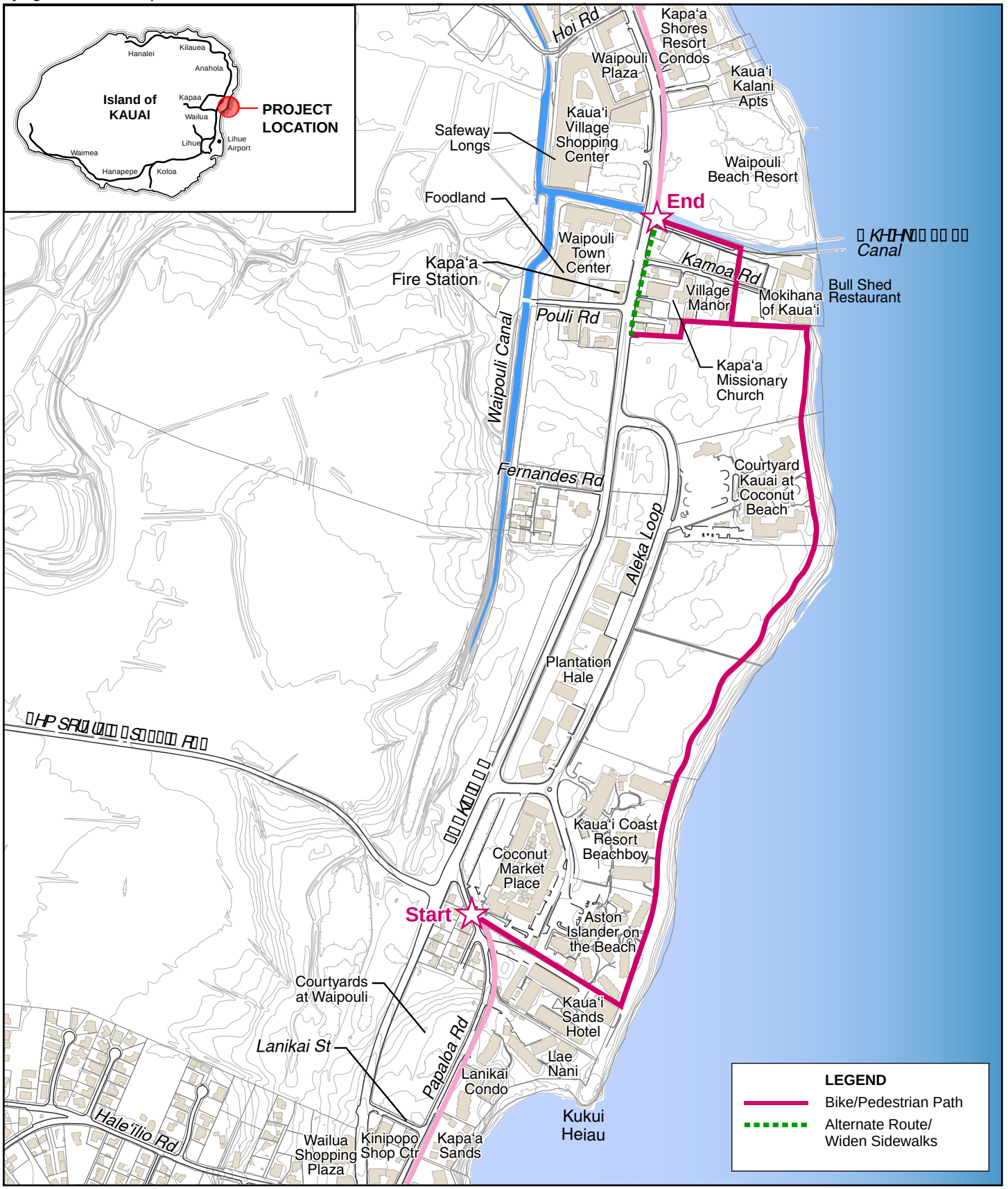
0 250 500 1000 Feet

0 Mile 1 Mile

Figure 1

OVERALL BIKE/PEDESTRIAN PATH ALIGNMENT IN PHASES

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D



0 200 400 800 Feet

Figure 2

PROJECT LOCATION

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D

0 200 400 800 Feet

N

Figure 3

AREA OF POTENTIAL EFFECT (APE)

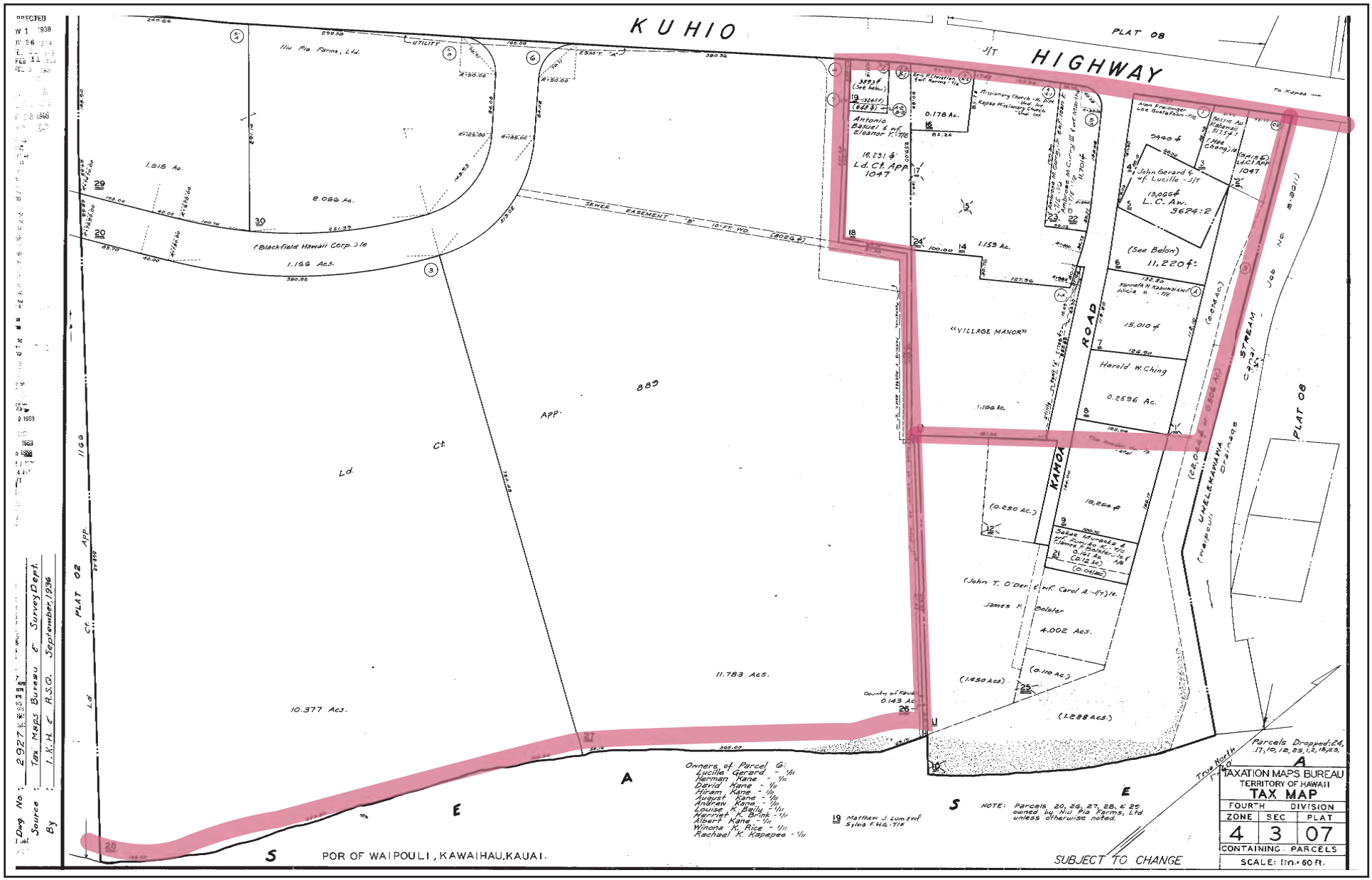
Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D

Figure 4a

TAX MAP 4-3-002

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D

NOT TO SCALE



031004/016 050313 r7

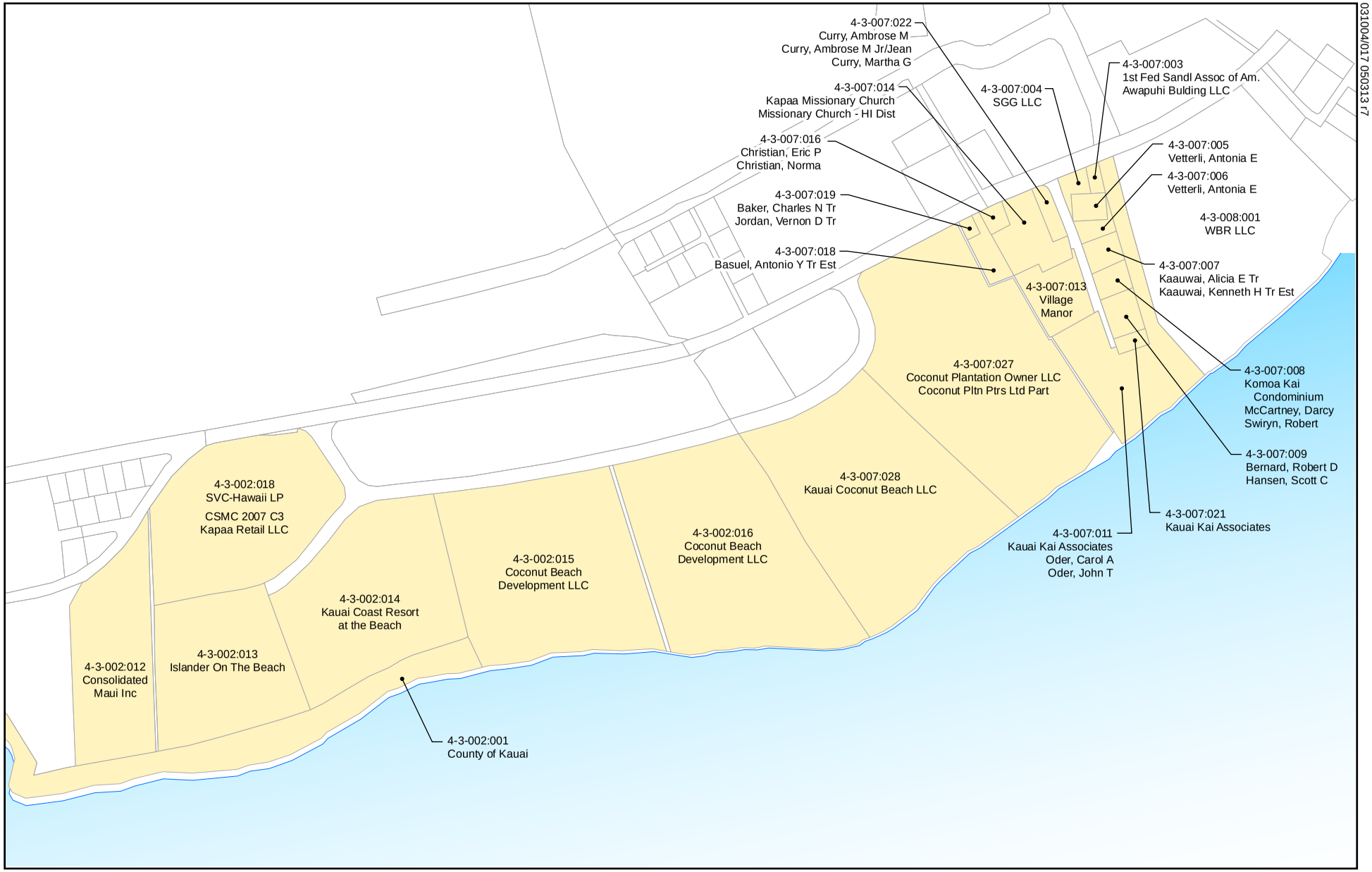
Figure 4b

TAX MAP 4-3-007

Lydgate Park – Kapaa Bike/Pedestrian Path
Phases C & D

NOT TO SCALE

Lydgate Park - Kapa'a Bike/Pedestrian Path



Source: Kauai County Tax Assessor Data 2012, Hawaii State GIS

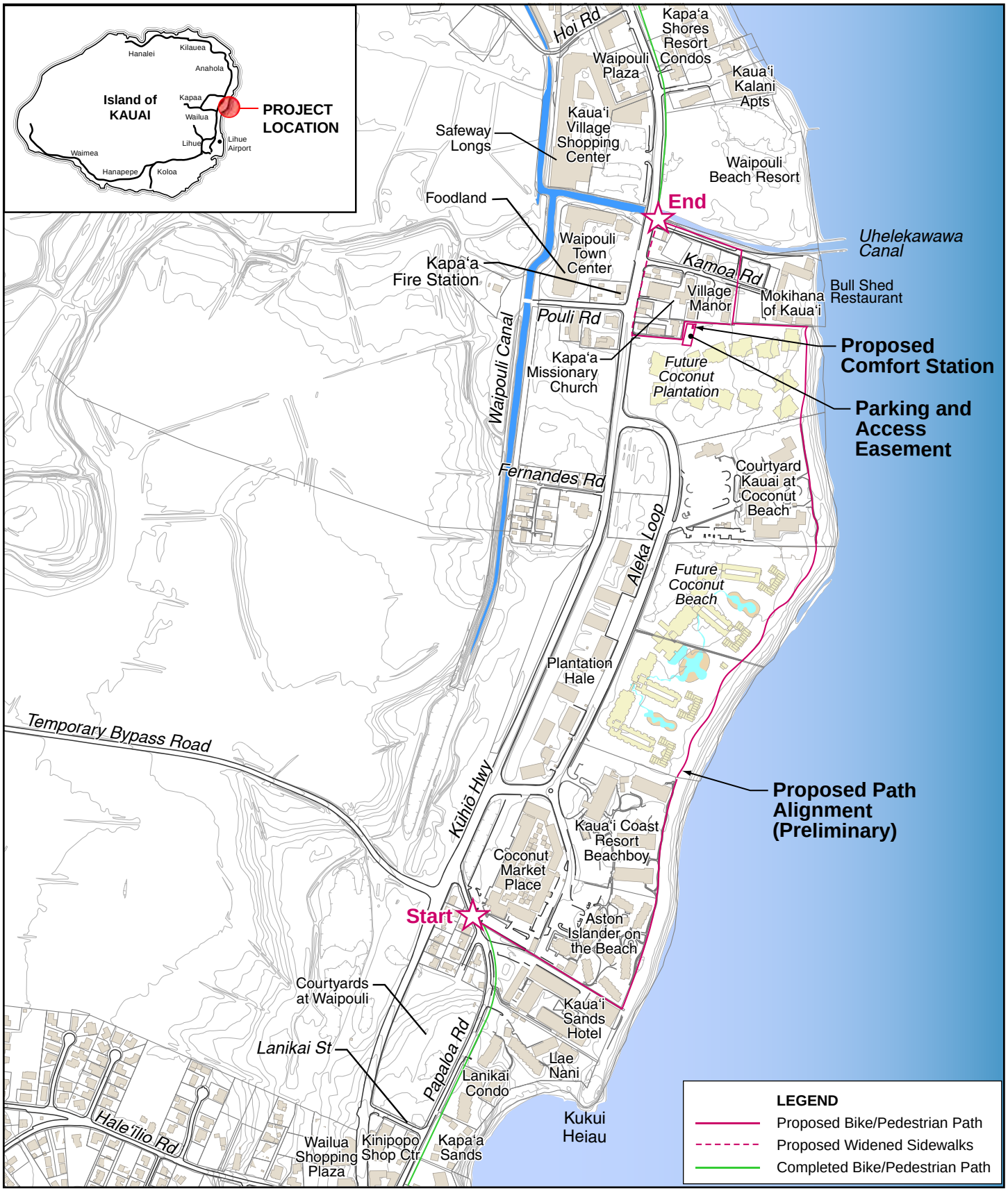
0 100 300 500 Feet

N

Figure 5

LAND OWNERSHIP WITH TMKs

Lydgate Park – Kapaa Bike/Pedestrian Path
Phases C & D



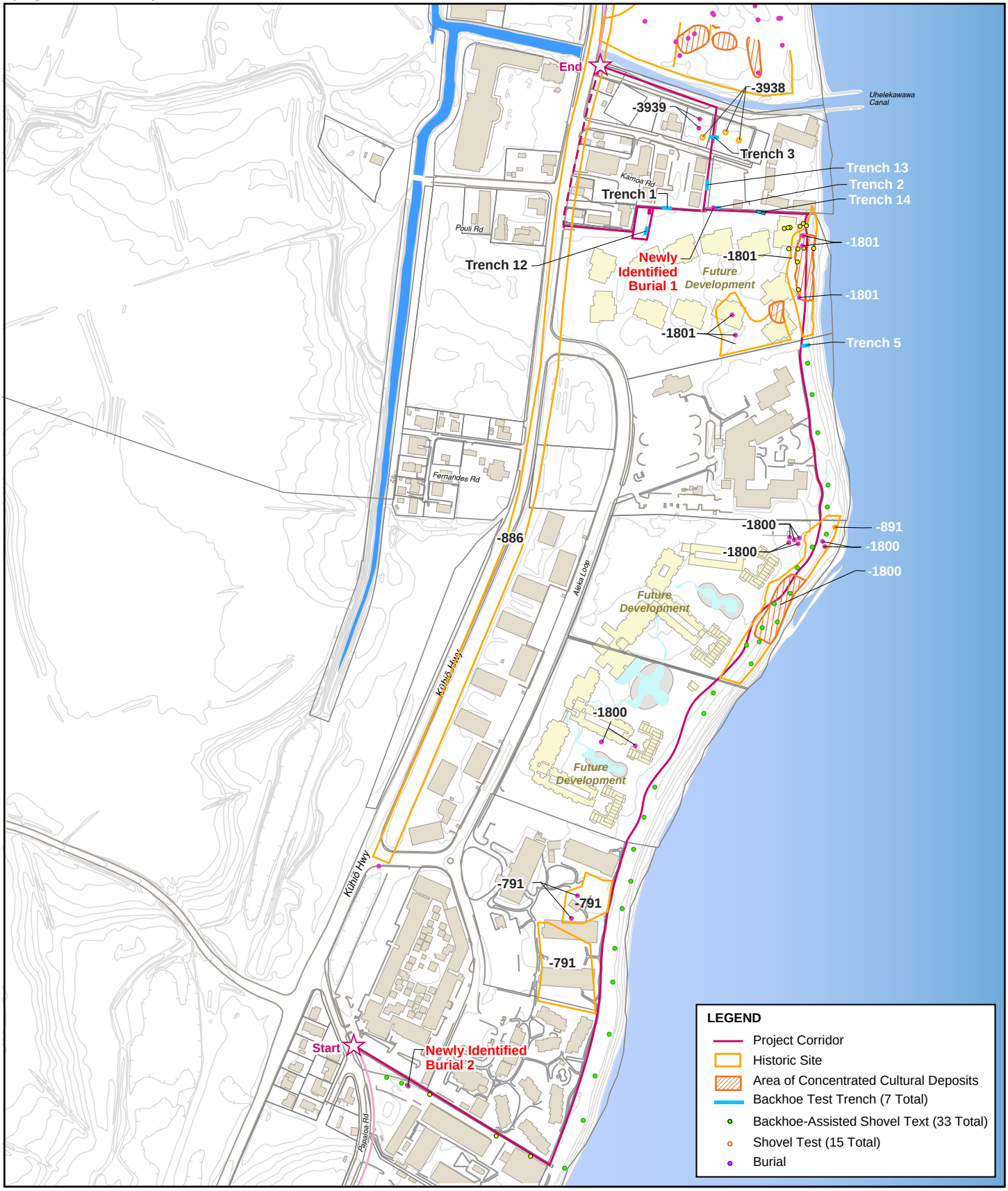
Future resort development based on preliminary plans, subject to change.

0 200 400 800 Feet

Figure 6

FUTURE DEVELOPMENT

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D



Future resort development based on preliminary plans, subject to change.

0 200 500 Feet

Figure 7

HISTORIC PROPERTIES

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D

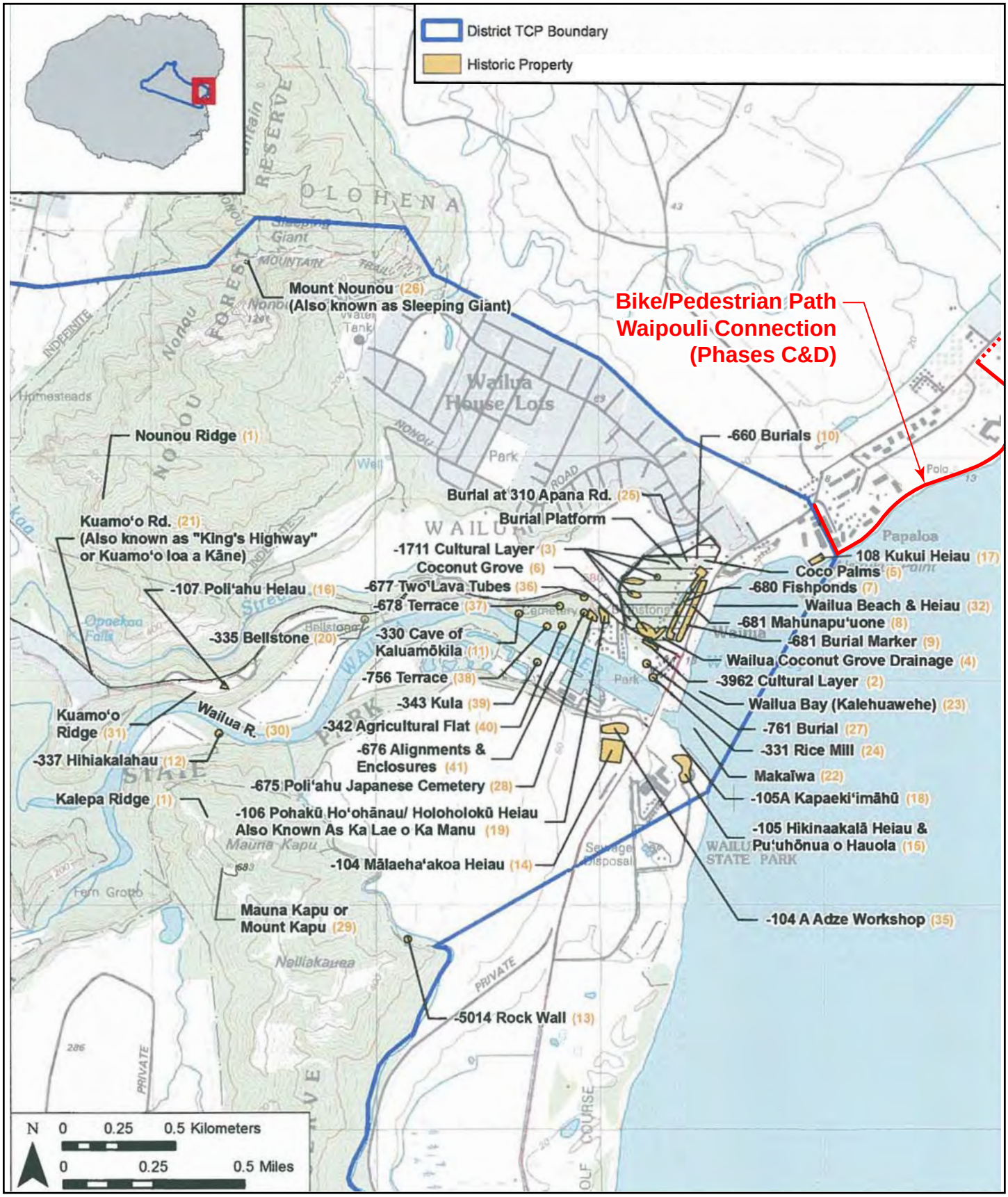
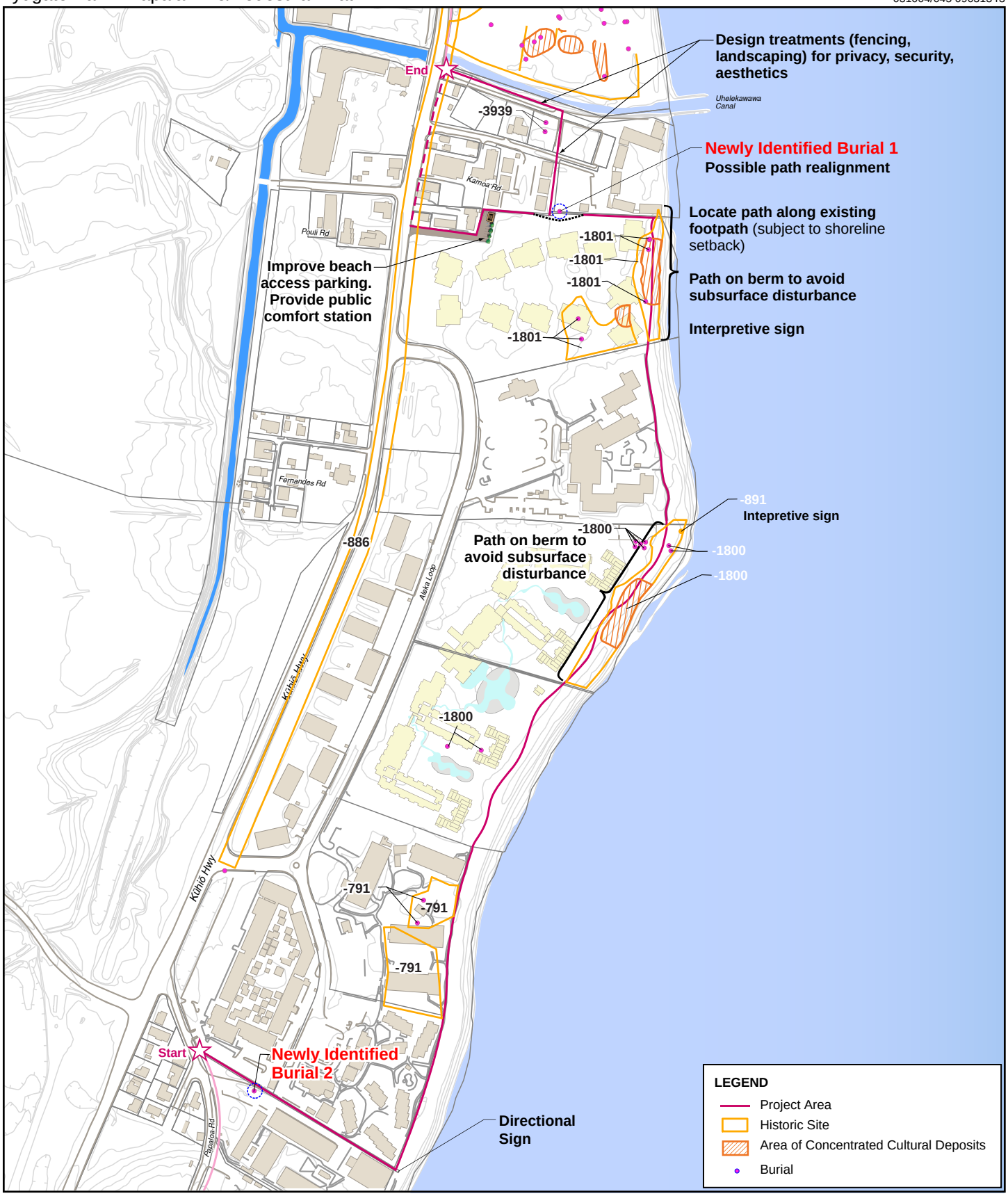


Figure 8

WAILUA TRADITIONAL CULTURAL PROPERTY (TCP)

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D



Future resort development based on preliminary plans, subject to change.

0 200 500 Feet

Figure 9

PROPOSED MITIGATIONS

Lydgate Park − Kapaa Bike/Pedestrian Path
Phases C & D

0 200 400 800 Feet

N

Figure 10
PHOTO LOCATIONS
Lydgate Park − Kapaa Bike/Pedestrian Path
Waipouli Connection

Photo 1. Papaloa Road near Kauai Sands Hotel

Photo 2. Easement between Kauai Sands Hotel and Islander on the Beach

Photo 3. Beach reserve, makai of Islander on the Beach

Photo 4. Beach reserve, makai of Kauai Coast Resort

Photo 5. From Kauai Coast Resort, looking north

Photo 6. Vacant parcels (TMK: 4-3-2: 15 and 16)

Photo 7. Marriott Courtyard Kauai

Photo 8. From Marriott Courtyard Kauai looking north

Photo 9. Vacant parcel TMK: 4-3-7: 27, looking north

Photo 10. Vacant parcel TMK: 4-3-7: 27, looking south

Photo 11. Vacant parcel TMK: 4-3-7: 27, south of Mokihana of Kauai

Photo 12. Preferred alignment makai of Village Manor

Photo 13. South side of Uhelekawawa Canal

Photo 14. Kuhio Highway at bridge over Uhelekawawa Canal

Attendance Sheet

Meeting: Lydgate-Kapaa Bike/Pedestrian Path, Phases C & D Public Information Meeting, HRS 343/NEPA
Date/Time: Tuesday, February 21, 2012, 6:00 PM

Name	Contact Information—CONFIDENTIAL, Not for Public Release	
	Mailing Address	E-mail Address
Ellender Miller		
Tommy Noyes		
Julie Wirtz		
Sandi Kata-Kurtz		
Esti Griupas		
Stephanie Ano		
Helaine Perez		
Stacy Ricciardi		
Dana Bekaert		
Bob Middleton		

Appendix C

Draft Archaeological Inventory Survey Report for the Lydgate-Kapa‘a Bike and Pedestrian Path Project, Phases C and D, CMAQ-0700(49), South Olohena, North Olohena, and Waipouli Ahupua‘a, Kawaihau District, Island of Kaua‘i, TMK: [4] 4-3-001, 002, 007: Various

Prepared by Kelly L. Burke and Hallett H. Hammatt

[Cultural Surveys Hawaii, Inc.], October 2012

Draft
Archaeological Inventory Survey Report For the Lydgate–Kapa‘a Bike and Pedestrian Path Project, Phases C and D, CMAQ-0700(49), South Olohena, North Olohena, and Waipouli Ahupua‘a, Kawaihau District, Island of Kaua‘i, TMK: [4] 4-3-001, 002, and 007:various

Prepared for

Kimura International, Inc.

Prepared by

Kelly L. Burke, M.Sc.

and

Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.

Kailua, Hawai‘i

(Job Code: WAIPOULI 3)

October 2012

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Management Summary

Reference	Archaeological Inventory Survey Report for the Lydgate Park–Kapa‘a Bike and Pedestrian Path, Phases C and D, CMAQ-0700(49), South Olohena, North Olohena, and Waipouli Ahupua‘a, Kawaihau District, Island of Kaua‘i, TMK: [4] 4-3-001, 002, and 007:various (Burke and Hammatt 2012)
Date	October 2012
Project Number(s)	Cultural Surveys Hawai‘i (CSH) Job Code: WAIPOULI 3
Investigation Permit Number	CSH completed the fieldwork component of the archaeological inventory survey (AIS) under Hawai‘i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) permit no. 12-04, issued per Hawai‘i Administrative Rules (HAR) Chapter 13-13-282.
Project Location	The current project is located on the *makai* (ocean) side of Kūhiō Highway, extending from Papaloa Road to Waipouli Beach Resort.
Land Jurisdiction	State of Hawai‘i, County of Kaua‘i
Agencies	SHPD/DLNR; State Office of Environmental Quality Control (OEQC); U.S. Department of Transportation, Federal Highway Administration
Project Description	The project area is comprised of a 50-foot wide corridor that is proposed for development of a 10 to 12-foot wide bike and pedestrian path. There is no specific alignment for the path within this corridor yet, in order to avoid any findings from this AIS. The path will be constructed of concrete and have graded shoulders. In certain instances, it may be necessary to vary the type of construction material used. Ground disturbance associated with the installment of the path will include excavations typically less than 1 foot deep. In addition to the path itself, several other features will be constructed and/or renovated. A 16-x-24 foot comfort station is proposed at the north end of the project area and will be excavated down to the coral shelf. An associated sewer line will also be excavated that will tie into a nearby existing sewer line. (Note that the entire 16-x-24 foot comfort station footprint was excavated down to the coral shelf during this AIS.) A section of the path that crosses a stream will involve the construction of a bridge. The bridge is proposed to be either a cantilevered attachment to the existing highway bridge or an independent, single-span bridge. An existing County parking area located behind Kapa‘a Missionary Church may need to be rehabilitated. It may also be necessary to relocate and/or replace existing facilities and/or plant life from developed areas along the path. Additional features of the construction of the path include grading, walls, railings, fencing, landscaping, signage, and amenities, such as

	trash receptacles, benches, water fountains, and shielded security lighting. The County of Kaua‘i will construct, own, and maintain the multi-use path, and the project will be funded in part by the U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA).
Project Acreage	Approximately 8.6 acres
Area of Potential Effect (APE)	The APE for the current AIS investigation is defined as the entire approximately 8.6-acre project area.
Historic Preservation Regulatory Context	This document was prepared to support the proposed project's historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-42 and HAR Chapters 13-13-284. In consultation with the SHPD/DLNR, the AIS investigation was designed to fulfill the state requirements for an AIS, pursuant to HAR Chapter 13-13-276. This study follows a cultural impact assessment (Vogeler, Magat, and Hammatt 2012) and a Section 106 Consultation Plan (Vogeler, Magat, Genz, and Hammatt 2012), both of which are currently being reviewed by the SHPD.
Fieldwork Effort	Fieldwork was conducted between July 25 and August 6, 2012 and on September 11, 2012 by CSH archaeologists Missy Kamai, B.A., Gerald Ida, B.A., Johnny Dudoit, B.A., Trevor Yucha, B.A., Tyler Turran, B.A., Frederick LaChance, B.A., Pulama Lima, B.A., and Kelly Burke, M.Sc. and required approximately 38 person-days to complete. All fieldwork was performed under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator).
Number of Historic Properties Identified	Two new historic properties were identified within the project area: CSH Burial 1, SIHP # TBD, and CSH Burial 2, SIHP # TBD. Cultural layers observed in several trenches throughout the project area were combined into pre-existing historic properties based on location (*ahupua‘a*): cultural layer within South Olohena Ahupua‘a, SIHP # 50-30-08-791; cultural layers within North Olohena Ahupua‘a, SIHP # 50-30-08-1800; and cultural layers within Waipouli Ahupua‘a, SIHP # 50-30-08-1801.
Historic Properties Recommended Eligible to the Hawai‘i Register of Historic Places (Hawai‘i Register)	SIHP # TBD, CSH Burial 1 SIHP # TBD, CSH Burial 2 SIHP # 50-30-08-791, cultural layer and burials SIHP # 50-30-08-1800, cultural layers and burials SIHP # 50-30-08-1801, cultural layer and burials
Historic Properties Recommended Ineligible to the Hawai‘i Register	None

Effect Recommendation	CSH's project-specific effect recommendation is "effect, with agreed upon mitigation commitments" (in accordance with HAR 13-284-7). The recommended mitigation measures will reduce the project's effect on significant historic properties that were identified within the project area and be pro-active in addressing possible community concerns.
Mitigation Recommendation	CSH recommends that project construction proceed under an archaeological monitoring program. CSH recommends that the two burials identified during this AIS (SIHP #s TBD), will be treated according to the provisions of burial treatment plan(s) to be prepared in accordance with HAR 13-300 -33. The multi-use path should also be situated to avoid, as much as possible, SIHP #s -791, -1800, and -1801.

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Section 1 Introduction

1.1 Project Background

At the request of Kimura International, Inc., Cultural Surveys Hawai‘i, Inc. (CSH) conducted an archaeological inventory survey (AIS) for Phases C and D of the Lydgate Park–Kapa‘a Bike and Pedestrian Path Project, South Olohena, North Olohena, and Waipouli Ahupua‘a, Kawaihau District, Kaua‘i Island (TMKs [4] 4-3-001, 002, and 007:various). The project area is located on the *makai* (ocean) side of Kūhiō Highway, extending from Papaloa Road to Waipouli Beach Resort. The location of the project area is depicted on the 1996 U.S. Geological Survey (U.S.G.S.) 7.5-minute topographic map, Kapa‘a quadrangle (Figure 1), a 2012 aerial photograph (Figure 2), and Tax Map Key [4] 4-3 (Figure 3). The locations of all phases of the multi-use path are depicted on Figure 4.

The project area is comprised of a 50-foot (ft)-wide corridor that is proposed for development of a 10 to 12-ft-wide bike and pedestrian path. There is no specific alignment for the path within this corridor yet, in order to avoid any findings from this AIS. The path will be constructed of concrete and have graded shoulders. In certain instances, it may be necessary to vary the type of construction material used. Ground disturbance associated with the installment of the path will include excavations typically less than 1 ft deep.

In addition to the path itself, several other features will be constructed and/or renovated. A 16-x-24 ft comfort station is proposed at the north end of the project area and will be excavated down to the coral shelf. An associated sewer line will also be excavated that will tie into a nearby existing sewer line. (Note that the entire 16-x-24 ft comfort station footprint was excavated down to the coral shelf during this AIS). A section of the path that crosses a stream will involve the construction of a bridge. The bridge is proposed to be either a cantilevered attachment to the existing highway bridge or an independent, single-span bridge. An existing County parking area located behind Kapa‘a Missionary Church may need to be rehabilitated. It may also be necessary to relocate and/or replace existing facilities and/or plant life from developed areas along the path. Additional features of the construction of the path include grading, walls, railings, fencing, landscaping, signage, and amenities, such as trash receptacles, benches, water fountains, and shielded security lighting.

The County of Kaua‘i will construct, own, and maintain the multi-use path, and the project will be funded in part by the U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA).

This AIS report was preceded by a cultural impact assessment (Vogeler, Magat, and Hammatt 2012) and a Section 106 Consultation Plan (Vogeler, Magat, Genz, and Hammatt 2012), both of which are currently being reviewed by the SHPD.

Figure 1. 1996 U.S. Geological Survey 7.5-minute topographic map, Kapa‘a quadrangle, depicting location of project area

Figure 2. Aerial photograph depicting location of project area (GoogleEarth 2010)

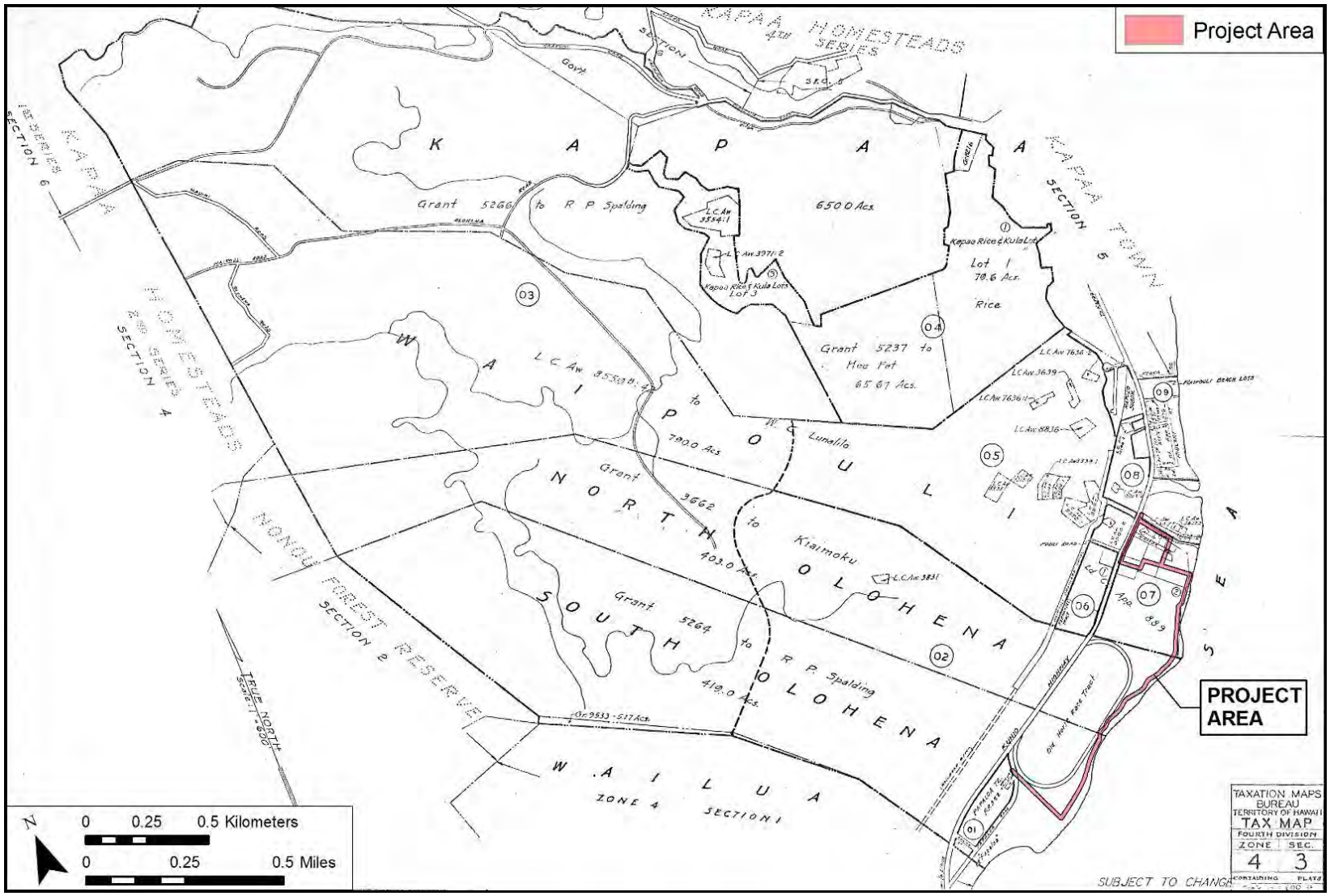

Figure 3. TMK: [4] 4-3 depicting location of project area (Hawai‘i TMK Service 2012)

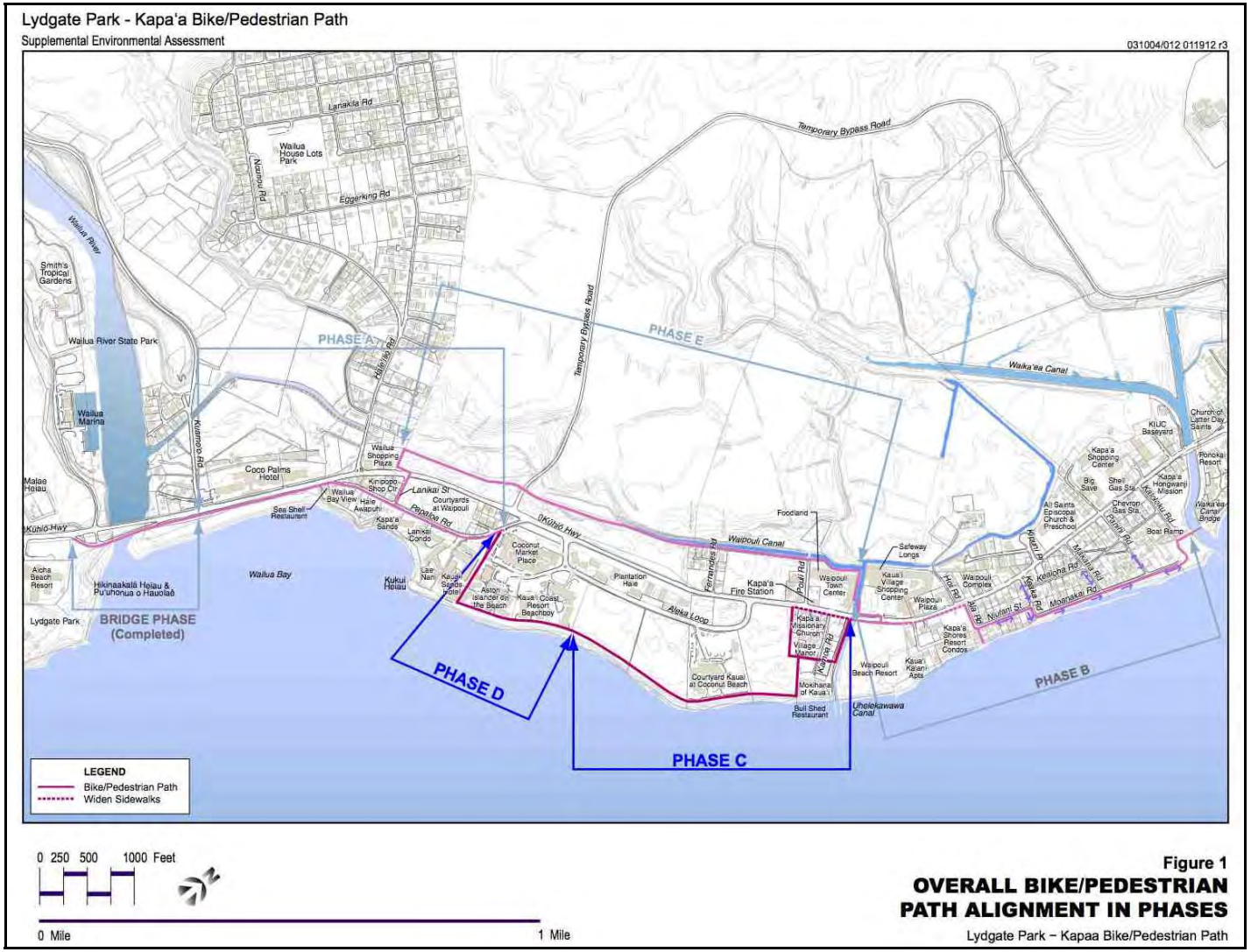

Figure 4. Locations of all phases of the Lydgate Park–Kapa‘a multi-use path project (note that the route has been updated since this figure was produced; Kimura International, Inc. 2007)

1.2 Scope of Work

The following AIS scope of work was designed to satisfy the Hawai‘i state requirements for AIS (Hawai‘i Administrative Rules [HAR] Chapter 13-13-276 and 13-13-284):

1. Historic and archaeological background research, including a search of historic maps, written records, Land Commission Award (LCA) documents, and reports from prior archaeological investigations. This research will focus on the specific project area’s past land use, with general background on the pre-Contact and historic settlement patterns of the *ahupua‘a* and district. This background information will be used to compile a predictive model for the types and locations of historic properties that could be expected within the project area;
2. A field inspection of the project area to identify any potential surface historic properties. Surface historic properties will be recorded with an evaluation of age, function, interrelationships, and significance. Documentation will include photographs, scale drawings, and, when warranted, limited, controlled excavation of select sites and/or features;
3. Based on the project area’s environment and the results of the background research, subsurface testing with a combination of hand and backhoe excavation to identify and document subsurface historic properties that would not be located by surface pedestrian inspection, as deemed appropriate. Appropriate samples from these excavations will be analyzed for cultural and chronological information. All subsurface historic properties identified will be documented to the extent possible, including geographic extent, content, function/derivation, age, interrelationships, and significance;
4. As appropriate, consultation with knowledgeable individuals regarding the project area’s history, past land use, and the function and age of the historic properties documented within the project area; and
5. As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.
6. Preparation of an inventory survey report, which includes the following:
    a) A project description;
    b) A section of a US Geological Survey topographic map showing the project area boundary and the location of all recorded historic properties;
    c) Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity;
    d) Descriptions of all historic properties, including select photographs and scale drawings and discussions of age, function, laboratory results, and significance. Each historic property will be assigned a Hawai‘i State Inventory of Historic Properties (SIHP) number;
    e) If appropriate, a section concerning cultural consultations;

f) A summary of historic property categories, integrity, and significance based upon the Hawai‘i Register of Historic Places (Hawai‘i Register) criteria;

g) A project effect recommendation; and

h) Treatment recommendations to mitigate the project’s adverse effect on any historic properties identified in the project area that are recommended eligible to the Hawai‘i Register.

This scope of work includes full coordination with the SHPD/DLNR and the City relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

1.3 Environmental Setting

The project area lies on the east side of Kaua‘i and traverses three *ahupua‘a* (land divisions): Waipouli at the northern end of the project area, North Olohena in the middle, and South Olohena at the southern end. These three *ahupua‘a* are located within the central area of the Līhu‘e Plain. During higher sea levels, terrigenous sediment accumulated further inland as streams released their sediment loads where the shoreline had encroached. Also, reefs grew with the rising sea level, and, as the sea receded once again, marine sediment was created and deposited on shore by the erosion of these reefs. Both of these processes were part of the formation of the Līhu‘e Plain (Armstrong 1973:30).

This area is exposed to prevailing northeast trade winds and receives 40 to 50 inches (in) of rainfall annually at the seashore and 60 to 90 in in the upland mountainous area (Giambelluca et al. 2011). Elevation within the project area ranges from 13 to 20 ft above annual mean sea level. Natural vegetation within the project area consists of *kiawe, klu, koa haole,* bermudagrass, napier grass, *guava,* and *joee* (Foote et al. 1972:95). Rows of ironwood trees interspersed with coconut trees were located along the coast.

Sediments within the project area consist of Mokuleia fine sandy loam (Mr) and Beaches (BS) (Figure 5). The Mokuleia series soils are described as “well-drained soils along the coastal plains on the islands of O‘ahu and Kaua‘i. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level” (Foote et al. 1972:95). Beaches are described as “sandy, gravelly, or cobbly areas… [and] consist mainly of light-colored sands derived from coral and seashells” (Foote et al. 1972:28).

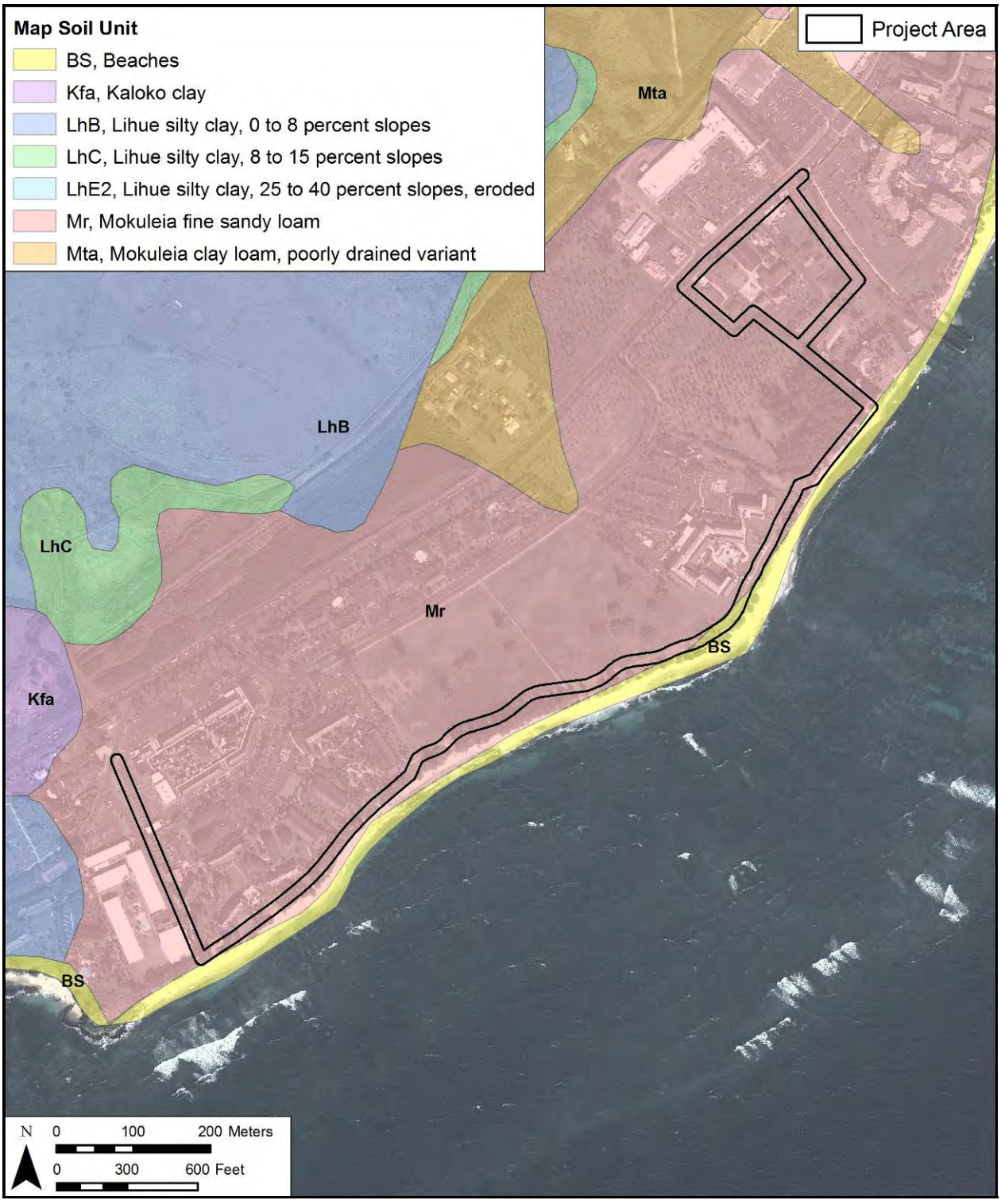

Figure 5. Overlay of Soil Survey of the State of Hawai‘i (Foote et al. 1972) depicting sediment types within and surrounding the project area (base map: 1996 Kapa‘a U.S. Geological Survey 7.5-minute topographical quadrangle map)

Section 2 Methods

2.1 Field Methods

CSH completed the fieldwork component of the AIS under SHPD/DLNR permit No. 12-04, issued pursuant to HAR Chapter 13-13-282. Fieldwork was conducted between July 25 and August 6, 2012 and on September 11, 2012 by CSH archaeologists Missy Kamai, B.A., Gerald Ida, B.A., Johnny Dudoit, B.A., Trevor Yucha, B.A., Tyler Turran, B.A., Frederick LaChance, B.A., Pulama Lima, B.A., and Kelly Burke, M.Sc. This effort required approximately 38 person-days to complete. All fieldwork was performed under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator).

2.1.1 Pedestrian Inspection

A 100 percent pedestrian inspection of the project area was undertaken for the purpose of historic property identification and documentation. The pedestrian survey was accomplished by walking along the extent of the proposed narrow multi-use path.

2.1.2 Ground Penetrating Radar (GPR) Survey

GPR data is acquired by transmitting pulses of electromagnetic energy, in the radar frequency range, into the ground via a sending antenna. Each time a radar pulse encounters material with a different density, electrical conductivity, or chemical composition, a portion of the radar energy will reflect back to the surface and be recorded via a receiving antenna. The remaining radar energy will continue to pass into the ground to be further reflected, until it finally dissipates with depth. Reflection features may include discrete objects, stratigraphic layering, or other subsurface anomalies such as subsurface disturbances associated with utility installation or human interment.

The effectiveness of GPR is highly dependent on local soil conditions. The penetration depth of GPR is determined by antenna frequency and the electrical conductivity of the earthen materials being profiled (Daniels 2004). Soils having high electrical conductivity rapidly attenuate radar energy, restrict penetration depths, and severely limit the effectiveness of GPR (US Department of Agriculture (USDA) National Resource Conservation Service [NRCS] GPR Methodology n.d.). The electrical conductivity of soils increases with increasing water, clay, and soluble salt contents.

GPR suitability maps created by the NRCS were reviewed in an attempt to anticipate the predominant soil matrix within the project area and to assess the relative suitability of GPR application. The project area is shown to include lands in the moderate and very low GPR suitability categories. The NRCS provides the following discussion when defining their GPR suitability categories:

> Areas dominated by mineral soil materials with less than 10 percent clay or very deep organic soils with pH values < 4.5 in all layers have very high potential for GPR applications. Areas with very high potential afford the greatest possibility for deep, high resolution profiling with GPR. However, depending on the ionic

> concentration of the soil solution and the amounts and types of clay minerals in the soil matrix, signal attenuation and penetration depths will vary. With a 200 MHz antenna, in soils with very high potential for GPR, the effective penetration depth has averaged about 16.5 feet. However, because of variations in textural layering, mineralogy, soil water content, and the ionic concentration of the soil water, the depth of penetration can range from 3.3 to greater than 50 ft.
>
> Areas dominated by mineral soils with 18 to 35 percent clay or with 35 to 60 percent clay that are mostly low-activity clay minerals have moderate potential for GPR. Low activity clays are principally associated with older, more intensely weathered soils. In soils with moderate potential for GPR, the effective penetration depth with a 200 MHz antenna has averaged about 7 feet with a range of about 1.6 to 16 ft. Though penetration depths are restricted, soil polygons with moderate potential are suited to many GPR applications Mineral soils with 35 to 60 percent clay, or calcareous and/or gypsiferous soils with 18 to 35 percent clay have low potential for GPR. Areas with low potential are very depth restrictive to GPR. In soils with low potential for GPR, the depth of penetration with a 200 MHz antenna has averaged about 1.6 ft with a range of about 0.8 to 6.5 ft.
>
> Areas that are unsuited to GPR consist of saline and sodic soils. These soil map units are principally restricted to arid and semiarid regions and coastal areas of the United States [USDA NRCS GPR Methodology n.d.].

Note that the estimated depth penetration by the NRCS is based on the use of a 200 MHz antenna. The current survey will utilize a 400 MHz antenna, which balances radar penetration depth with image resolution, so all projected depth estimates by the NRCS must be cut in half. Thus, average depth penetration would be 3.5 ft (1 meter [m]) in moderate suitability areas and 0.8 ft (0.2 m) in low suitability areas.

2.1.2.1 Survey Methodology

The GPR survey was conducted using a Geophysical Survey Systems, Inc. SIR-3000 system equipped with a 400 MHz radar antenna proceeding along transects within a survey grid. Due to computer interpolation software (*Surfer 9*) it was only necessary to run data collection transects along one axis of each survey grid (X or Y). In order to standardize the data collection process, all transects were run in the Y direction, originating from an arbitrary southwest corner (Figure 6). Transect spacing was 50 centimeters (cm).

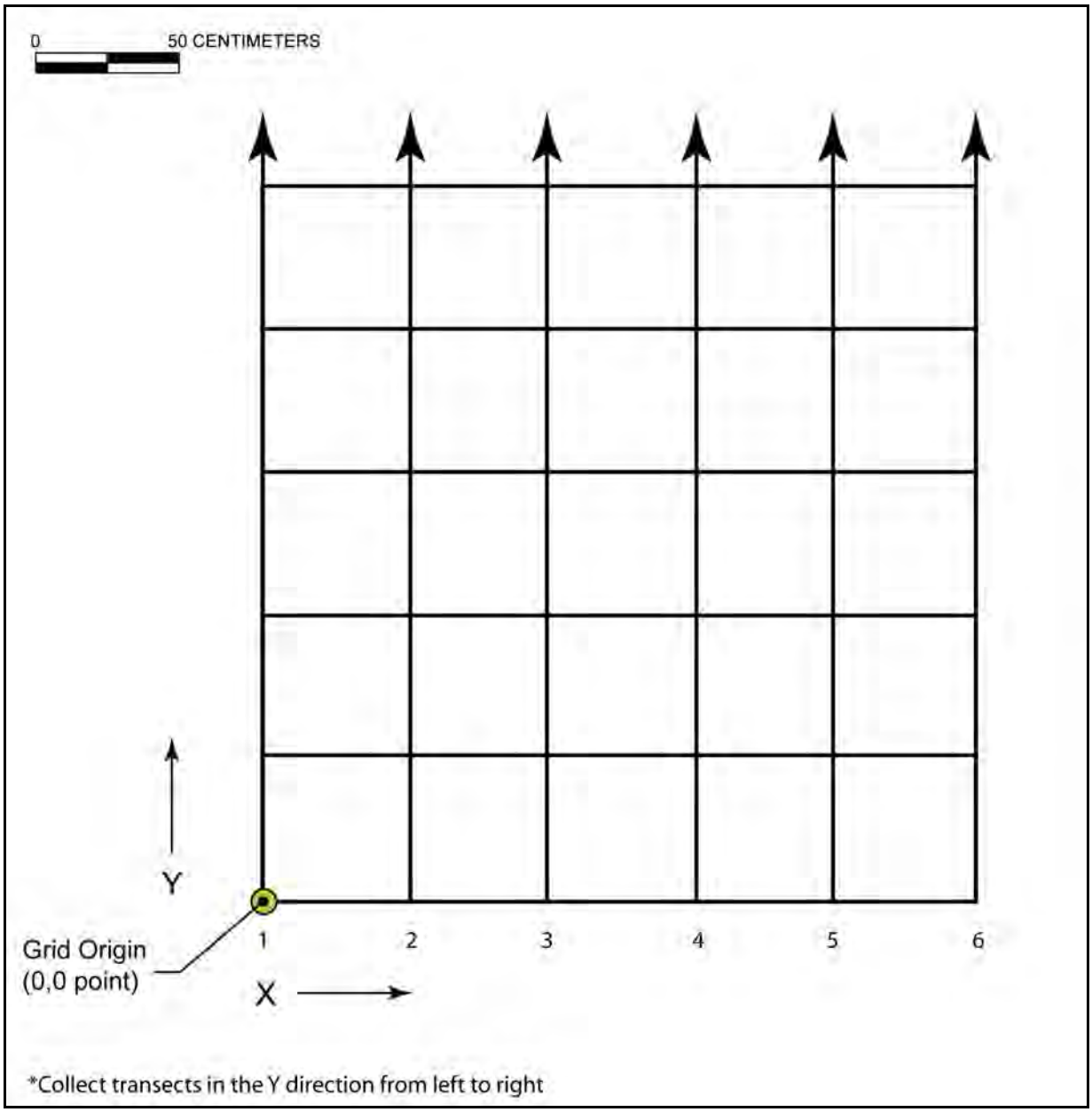

Figure 6. Illustration of GPR survey grid and method of data collection

2.1.2.2 Data Collection Parameters

GPR data collection parameters were held constant throughout the survey (Table 1).

Table 1. GPR Data Collection Parameters

Parameter	Settings
Antenna	400 MHz
Transmission rate	100KHz
Samples	512
Format	16-bit
Range	40 nanoseconds
Dielectric	14.00
Rate	100
Scans per unit	45 per meter
Low Pass Filter	750MHz
High Pass Filter	200MHz

2.1.2.3 Post-Processing

All collected GPR data were post-processed using the following software: *RADAN 6.6*, *GPR Process*, and *Surfer 9*.

RADAN 6.6 was utilized to generate two-dimensional depth profiles from the collected GPR data. These profiles illustrate the geometry of the reflections recorded during data collection. An analysis of these profiles can determine whether the radar energy is reflecting from a flat stratigraphic layer (seen as a distinct horizontal band on a profile), a discrete buried object (seen as a hyperbola in profile), or from stratigraphic irregularities such as subsurface disturbances associated with utility installation or human interment (also seen as hyperbolas, but usually are more ephemeral and consist of clustered reflections).

Position correction was utilized to remove unwanted surface “noise” from GPR profiles. High and low pass filters were applied to remove any excess background noise generated from nearby power lines, radio frequencies, etc. during data collection. Gain (signal amplification) was also applied to accent poorly defined or ephemeral reflections that are typically associated with subsurface cultural deposits.

A combination of *GPR Process* and *Surfer 9* was used to generate amplitude slice maps from the collected GPR data. Amplitude slice-maps are a three-dimensional tool for viewing differences in radar reflection amplitudes across a given surface at various depths. Amplitude slice-maps can be thought of as plan view maps or excavation level records that display GPR at user-defined depth intervals. Reflected radar amplitudes are of interest because they measure the degree of physical and chemical differences in buried materials, which in turn can indicate the presence of stratigraphic interfaces, discrete buried objects (i.e., basalt boulders, utility lines, burial caskets, etc.), or stratigraphic irregularities (i.e., subsurface anomalies associated with burial pits, fire pits, buried irrigation ditches, etc.). The amplitude slice maps are also important because they allow the visualization of radar reflections throughout the entire data set collected

at a survey area at a given depth. This gives size and shape to collected radar reflections, which can aid in the interpretation of identified subsurface anomalies.

Amplitude slice-maps are generated through the comparison of radar reflection amplitudes recorded in vertical depth profiles, which correspond to individual transects collected within a survey grid along the X-axis (note that while transects are collected in the Y-direction, they are actually located within the X-axis.). In this method, amplitude variations are analyzed at each location where a radar reflection was recorded. Reflection amplitude data from the X-axis is then used to interpolate reflection data on to the Y-axis.

2.1.3 Subsurface Testing

The subsurface testing program included the excavation of 10 backhoe test trenches, 33 backhoe-assisted shovel tests, and 15 manual shovel tests. The hand-excavated shovel tests ranged from 0.30 to 0.66 m in diameter and from 0.50 to 0.85 m in depth. The backhoe-assisted shovel tests ranged from 0.46 to 0.80 m in length and from 0.52 to 1.38 m in depth. The test trenches measured between 6.5 and 7.5 m long, 0.75 and 0.9 m wide, and ranged in depth from 0.75 to 1.95 m. Shovel testing was chosen as an appropriate method for the following reasons: 1) Shovel tests would cause less adverse impact to deposits in known site areas in comparison to standard sized backhoe trenches; 2) Shovel testing allows broader coverage and can more efficiently determine distribution of cultural layers than standard size backhoe trenches.

The stratigraphic profile of each test excavation was drawn and photographed. The observed sediments were described using standard USDA soil description observations/terminology. Sediment descriptions included: Munsell color; texture; consistency; structure; plasticity; cementation; origin of sediments; descriptions of any inclusions, such as cultural material and/or roots; lower boundary distinctiveness and topography; and other general observations. Where stratigraphic anomalies were exposed, these were carefully represented on the trench excavation profile.

2.2 Laboratory Methods

Materials collected during AIS fieldwork were identified and cataloged at CSH’s laboratory facility in Waimānalo, on the island of O‘ahu. Analysis of collected materials was undertaken using standard archaeological laboratory techniques. Artifacts were washed, sorted, described, photographed, and cataloged. In general, artifact analysis focused on establishing, to the greatest extent possible, material type, function, cultural affiliation, and/or age of manufacture. Diagnostic (identifiable or dateable) attributes of artifacts were researched. A catalog of all collected material was prepared and is presented in Section 5, below.

Upon completion of the project, all material collected during subsurface testing will remain at the CSH Waimānalo office until a permanent facility is determined based on consultation with the landowner and the SHPD/DLNR.

2.3 Document Review

Background research included: a review of previous archaeological studies on file at the SHPD/DLNR library; review of historical documents at Hamilton Library at the University of

Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Archives of the Bernice Pauahi Bishop Museum (BPBM); study of historic photographs at the Hawai‘i State Archives and the Archives of the BPBM; study of historic maps at the Hawai‘i State Land Survey Division; and study of historic maps and photographs at the CSH library. Information on LCAs was accessed through Waihona ‘Aina Corporation’s Māhele Database (www.waihona.com), as well as a selection of CSH library references. This research provided the environmental, cultural, historic, and archaeological background for the project area.

2.4 Consultation

Consultation for the current project was undertaken as part of the project’s Section 106 consultation plan (see Vogeler, Magat, Genz, and Hammatt 2012), as well as the cultural impact assessment (see Vogeler, Magat, and Hammatt 2012).

Several Section 106 meetings were convened including a preliminary organizational meeting with discussion of Protocol for future meetings and three follow-up meetings. The preliminary results of the archaeological investigation were presented and discussed at the last two meetings.

Section 3 Background Research

3.1 Legendary and Traditional Accounts

This section discusses legendary and traditional accounts of Waipouli, North Olohena, and South Olohena Ahupua‘a. For a more extensive discussion of the traditional and legendary background of this area, see Vogeler, Magat, and Hammatt 2012 and Vogeler, Magat, Genz, and Hammatt 2012.

3.1.1 *Wahi Pana* (Celebrated Places)

“In Hawaiian culture, if a particular spot is given a name, it is because an event occurred there which has meaning for the people of that time” (McGuire 2000:17). *Wahi pana* were passed on through the oral tradition, preserving the unique significance of each place. Hawaiians named all sorts of objects, places, and points of interest. In the following paragraphs, the place names (*wahi pana*) are in bold.

3.1.1.1 Wahi Pana of Waipouli

The name **Waipouli** literally means the “dark water” (Pukui et al. 1974; Thrum 1923; Wichman 1998), although it is referred to as “black waters” in *Ruling Chiefs of Hawaii* (Kamakau 1961:159). According to one theory, people may have seen the water appear darker during a solar eclipse, hence the name (Wichman 1998:82). Waipouli refers to the *ahupua‘a*, the village, and the beach. **Waipouli Beach** hugs the shoreline in a narrow stretch from the Coconut Plantation in Waipouli to Waika‘ea Canal in Kapa‘a. The currents remain strong throughout the year with the near-shore shallows quickly dropping into deep waters (Clark 1990:9).

Although by the twentieth century, Waipouli was considered “a rather insignificant *ahupua‘a*” (Handy and Handy 1972), clues to the history of this particular *ahupua‘a* are in the records of the 1872-73 Commission of Boundaries (1873) proceedings concerning Waipouli. The guardians of William C. Lunalilo petitioned for the definition and settlement of the boundaries for Waipouli Ahupua‘a in the district of Puna on Kaua‘i Island. Four witnesses, all Hawaiians familiar with Waipouli, gave evidence from which Duncan McBryde, the Commissioner of Boundaries, made his decision on November 7, 1872. A subsequent survey by James Gay was undertaken in June 1873.

McBryde's decision and Gay's survey notes (both included in the Boundary Commission record) contain place names, most of which are missing on modern maps of Waipouli. The place names were culled from the *Native Testimony* (1847-53) and *Commission of Boundaries* (1864-1905) records and from some nineteenth-century maps. The place names provide some of the last non-tangible clues to the extensive native Hawaiian activities that occurred throughout the *ahupua‘a*. Some of these place names are especially worth noting, as they suggest the origin of names present in Waipouli today.

For example, **Uhalekawaa** was the name of an 1872 village in Waipouli close to what was known as **Kauwanawa‘a** (“canoe harbor”). Today, Uhalekawaa is the name of a canal in northern Waipouli by the border of Kapa‘a. The Uhalekawaa area around the canal has a thick

cultural layer that dates back to the sixteenth century, with traditional artifacts related to fishing, weaponry, and woodworking (Kimura International 2007:4–40).

Kauwanawa‘a was a canoe harbor on the shore at the southern boundary of Waipouli. Also in the southern boundary was an “old pig pen **Papuaa**.” The *mauka* half of the northern boundary was the “site of old houses **Panene/Panini**” and “old houses **Kapukaili**.” A nearby stream was called **Panene Stream**; alongside it were two gulches named **Wailapa** and **Waikaanumununumu**. The presence of the pig pen and two old house sites suggests these were the only three populated areas within *mauka* reach of Waipouli before the nineteenth century. Areas at similar elevations in neighboring *ahupua‘a* are known to have been used for intensive agriculture.

Other names in the Boundary Commission records include: **Kopaea**, a bank located by the border Waipouli shares with North Olohena; **Ulalena**, a big hole on the same side; and **Kapapa**, a stream and a spur, also on the boundary shared with North Olohena. On the western tip of Waipouli was **Laauwaha** (**Loauwahia**), a tree at the edge of the forest. On the boundary shared with Kapa‘a was **Kainamanu** (“open space in bush” or “place for catching fowl”) and **Kahilimalanai** (**Kahilimalawa**), a large *‘ōhi‘a* tree.

In addition to Boundary Commission names, there are many storied places in Waipouli. **Mākaha-o-Kūpānihi** means “Kūpānihi is fierce” or “star of Kūpānihi;” it was the name of a deep bathing pool set aside for *ali‘i* use (Wichman 1998:83). Kūpānihi was the god one prayed to when canoes had to be carved. Mākaha refers to a star near the Pleiades—one of two stars (the other was Mākohi-Lani) that were the patrons of fighters (Wichman 1998:83). Keawe, half-brother of Kaumuali‘i, perished in the sacred pool of Mākaha-o-Kūpānihi after having been shot by two rival Maui chiefs hoping to curry favor from Kamuali‘i. Instead of rewarding them, Kaumuali‘i had the two chiefs put to death (Wichman 1998:84).

Marking the boundary between Waipouli and Kapa‘a along the coast was **Ka-lua-pā-lepo**, “pit for dirty dishes;” the boundary with Olohena was at **Kaunana-wa‘a**, “mooring place for canoes” (Wichman 1998:82). The Māhele records reveal six clusters of houses with names that provide a glimpse into pre-Contact Hawaiian society: **Kāne-limua**, “man overgrown with moss;” **Maka-lokoloko**, “eyes swelling up in tears;” **Makamaka-‘ole**, “without intimate friend;” **Mokuna-hele**, “traveling district;” and **Nā-hale-ka-wawā**, “houses where there is lots of noise” (Wichman 1998:82).

There was at least one fishpond in Waipouli according to land commission testimony. **Hapakio** was a fishpond (LCA 9013) of the *konohiki* (chief of an *ahupua‘a*).

3.1.1.2 Wahi Pana of North Olohena and South Olohena

North Olohena and South Olohena are *ahupua‘a* with rich histories, but the meaning of the name Olohena itself is unclear. **Olohena** refers to the *ahupua‘a* as well as a ridge. Pukui et al. (1974) state that Olohena has no known meaning, but may be a cognate with Olosenga, an island in the Manu‘a Group of Samoa. Clark (2002) and Wichman (1998) also do not provide a meaning for Olohena, although Wichman states that “the use of its name has all but disappeared as it calls to mind two hills whose shape resembles a pair of buttocks” (Wichman 1998:81). It may well be that the name is “a traditional Polynesian place name; meaning unknown. Variant spelling of Olohana” (Soehren 2010).

On the border of Wailua and Olohena, **Kaihuololoia** is an exposed red ridge on the Ke‘ālia side of Nounou (Wichman n.d.:2). The stone called **Kīkēkē**, which means “to knock, rap, tap, or pound,” is a marker on the border between Wailua and Olohena. It is located “on the brow of a hill near the sea” (Wichman n.d.:2). **Kulahuhū**, literally “angry plain,” is a pile of stones situated on the plain between Wailua and Olohena; it is associated with the battle between Kawelo and ‘Aikanaka around AD 1700 (Wichman n.d.:2). **Kamo‘oho‘opulu,** meaning “wet ridge,” is an actual ridge that acts as a boundary marker between Wailua and Olohena. **Kikake** is a point on the sea coast that is a division boundary between Wailua and Olohena (Wichman n.d.:3,14).

Pukui et al. (1974:170) note that Olohena is associated with **Mahe-walu**, short for Māhele-walu meaning “eight divisions,” a *heiau* on the ridge where human sacrifices were conducted; some sources have stated that Mahe-walu Heiau was another name for Kukui Heiau. In South Olohena, the name of the **Ka-iki-hāuna-kā** Heiau translates to “little striking blow” (Wichman 1998:81). Ka-iki-hāuna-kā was built by Kawelo after he beat ‘Aikanaka. A short distance from Ka-iki-hāuna-kā Heiau was **Hale-pā-iwi**, a house built especially for riddling. The house was encircled by a fence that was made from the bones of hapless riddlers who had lost the game, which is why the house is called Hale-pā-iwi, “house enclosed with bones” (Wichman 1998:82).

Kukui Heiau is also in Olohena. Kukui translates to “enlightenment” or “candlenut tree” and is situated on a headland called **Lae-‘ala-kukui**, “point of the scent of kukui” (Wichman 1998:82). Unusually large stones, some as heavy as a few tons, were used to construct the *heiau.*

North along the coast from Kukui Heiau is **Papaloa**, a village and a beach (Soehren 2010). “Papa” means “reef” and “loa” means “long;” Papaloa evidently refers to the reef offshore (Pukui and Elbert 1986). A nineteenth century account may be referring to a reef off Papaloa Beach. The Order of the Lords Commission of the Admiralty (1885) reports: “In 1880, a small steamer was observed secured to a buoy off Wailua, apparently inside a reef, as breakers were observed all around to seaward.”

3.1.2 *Mo‘olelo* (Oral-Historical Accounts)

3.1.2.1 Mo‘olelo of Waipouli

Waipouli is mentioned in a version of the legend of Kaililauokekoa, a female chief of Kapa‘a, the daughter of La‘a and granddaughter of Mo‘ikeha. Thomas Thrum (1906) explains that:

> [Kaililauokekoa's] greatest desire was to play konane, a game somewhat resembling checkers, and to ride the curving surf of **Makaīwa** (ke‘eke‘e nalu o Makaīwa), a surf which breaks directly outside of Waipouli, Kapa‘a. She passed the larger part of her time in this manner every day, and because of the continual kissing of her cheeks by the fine spray of the sea of Makaīwa, the bloom of her youth became attractive ‘as a torch on high,’ so unsurpassed was her personal charm [Thrum 1906:83–84, bold in original].

Waipouli is also the place where Hi‘iaka and Lohi‘au were reunited. Initially, Hi‘iaka had returned Lohi‘au to Pele, only to discover that Pele had not protected Hi‘iaka’s grove of lehua trees *(‘ōhi‘a)* as she had promised. Hi‘iaka, heartbroken, having travelled to Kaua‘i to find Lohi‘au and return him to Pele, had fallen in love with Lohi‘au. She kissed Lohi‘au. Pele, realizing what had occurred between them, killed Lohi‘au. Wichman (1998:82–83) explains:

“Pele covered Lohi‘au with lava and Hi‘iaka returned to Kaua‘i, vowing never to see her sister again. Two of Pele’s brothers took pity on Lohi‘au and brought him back to life.” Eventually, Lohi‘au and Hi‘iaka met in Waipouli during a game of kilu (an ancient game). They married and lived “the rest of their lives together at Hā‘ena.”

A portion of the *mo‘olelo* of Kawelo relates to Waipouli as well as North and South Olohena. In Green and Pukui’s (1936) account, Kawelo’s brother, Kamalama, distributes the lands in the “plain between Waipouli and Wailua which Ka-ma-la-ma had selected as a suitable place” for settlement:

> There the men received each portion and settled down to cultivate the land, while Ka-ma-la-ma turned toward the hills. The men made lo‘i, or taro patches, and set out such food-plants as they thought would flourish in this new land. They planted twelve breadfruit trees, one for each taro-patch, and, in order to have a name signifying unity, they called the place “The twelve breadfruit,” because the trees all came from a single mother-plant...These trees were famous in ancient days and even now their report is in the mouths of men.
>
> A pau kana haawi ana, ua huli aku ia o Kamalama no ke Kuamoo. A noho ihola lakou i na loi’ kalo, na ano mea ai a pau a lakou i manao ai i pono no ka noho ana o ia aina malihini. A kanu ihola no hoi lakou he umikumamalua mau kumu ulu;--hookahi kumu ulu o ka loi’ ho‘okahi;-- pela a pau na loi’ kalo he umikumamalua;--i kumu hoalike me ko lakou mau inoa,--mai ka ulu kaukahi a ka ula umikumamalua, i mea hoomanao hoi na na mea a pau, i na ulu umikumamalua. Aole paha i nele ka hoomanao ana o ka poe a ka wa kahiko i keia mau ulu kaulana, a hiki wale no i keia manawa e—o mau nei ia mau ulu i ka waha o na kanaka [Green and Pukui 1936:86–88].

The traditional *mo‘olelo* above reinforces the idea that Waipouli was a somewhat important *ahupua‘a*. Further evidence this *ahupua‘a* was a more interesting place comes from narrative accounts about the presence of Kiaimakani, a chief of Waipouli, and his role in two significant events affecting Kaua‘i in the first quarter of the nineteenth century.

In the first account, the year was 1824 when the brig named “Pride of Hawaii,” owned by Liholiho (Kamehameha II), ran aground in Hanalei Bay. Hiram Bingham (1847) recorded the effort of a crowd of Hawaiians trying to pull the vessel ashore to salvage:

> Kiaimakani passed up and down through the different ranks, and from place to place, repeatedly sung out with prolonged notes, and trumpet tongue... ‘be quiet - shut up the voice.’ To which the people responded... ‘say nothing,’ as a continuance of the prohibition to which they were ready to assent when they should come to the tug. Between the trumpet notes, the old chieftain, with the natural tones and inflections, instructed them to grasp the ropes firmly, rise together at the signal, and leaning inland, to look and draw straight forward, without looking backwards toward the vessel. They being thus marshaled and instructed, remained quiet for some minutes, upon their hams [Bingham 1847:221–222].

The salvage efforts ultimately failed and the brig was lost. Bingham’s account vividly suggests the force of the chief’s personality and his authority and stature that may have been founded upon the traditional prestige of his domain, Waipouli.

Kiaimakani also appears in Samuel Kamakau’s (1961) account of the 1824 rebellion of the chiefs of Kaua‘i upon the death of Kaumuali‘i. Kalanimoku, representative of Kamehameha II, called a council of the Kaua‘i chiefs at Waimea during which he announced,

> ‘The lands shall continue as they now stand. Our son, Kahala-i‘a, shall be ruler over you.’ A blind chief of Waipouli in Puna, named Ki‘ai-makani, said, ‘That is not right; the land should be put together and re-divided because we have a new rule,’ but Ka-lani-moku would not consent to this [Kamakau 1961:267].

Some Kaua‘i chiefs, including Kiaimakani, rebelled against the imposed decrees. His death is recorded thus:

> On August 8 [1824] the battles of Wahiawa were fought close to Hanapēpē. The Hawaii men were at Hanapēpē, the Kauai forces at Wahiawa, where a fort had been hastily erected and a single cannon (named Humehume) mounted as a feeble attempt to hold back the enemy... Large numbers of Kaua‘i soldiers had gathered on the battleground, but they were unarmed save with wooden spears, digging sticks, and javelins... No one was killed on the field, but as they took to flight they were pursued and slain. So Kia‘i-makani, Na-ke‘u, and their followers met death [Kamakau 1961:268].

Kamakau’s singling out of Kiaimakani for special mention reinforces the impression that the chief Kiaimakani and his *ahupua‘a* had a prestigious reputation.

3.1.2.2 Mo‘olelo of South and North Olohena

Kaikihāunakā Heiau was said to be a place where human sacrifices were held. Kaikihāunakā Heiau is linked to the *mo‘olelo* of Kawelo and ‘Aikanaka:

> After Kawelo defeated ‘Aikanaka, he built a heiau in Olohena that he named Ka-iki-hāuna-kā, ‘little striking blow.’ It was built as a place to make an offering to his war god of the first enemy warrior to have been killed in battle. This would have been one of the warriors Kawelo killed as his canoe was carried onto shore” [Wichman 1998:81].

Kaikihāunakā Heiau is also the setting for an account related by Thrum, regarding a man name Kalelealuaka (Thrum 1906:77). The *mo‘olelo* of Kalelealuaka tells of a man from Kaua‘i who arrives in Waialua, O‘ahu to look for a human body to use as a sacrifice in “the temple of Kahikihaunaka at Wailua, on Kaua‘i” (Thrum 1906:77). Kalelealuaka fetches what he believes is a corpse (in reality the unconscious hero Ka‘ōpele) and places it beside the body of another dead man in the altar at Kaikihāunakā Heiau. However, some accounts note that Ka‘ōpele was offered as a sacrifice at Kukui Heiau (Dickey 1916:19). But no matter what *heiau* he was offered at as a sacrifice, tradition dictates that Ka‘ōpele soon recovered, and he married and had a son named Kalelealuaka. Kalelealuaka grows up and travels to Wailua where he watches the chiefs engage in their games, before boxing with the king and killing him (Thrum 1906:83). As for his father, Ka‘ōpele undergoes more exploits on the island of O‘ahu.

An account of Kukui Heiau tells that:

> The giant Nunui collected the stones and put them in position and gathered the *‘ohi‘a lehua* logs from the mountains to build all the structures within the walls. After it was built, he was tired and stretched out on the nearby hilltop, where he still sleeps [Wichman 1998:82].

3.2 Historic Background

3.2.1 Early Historic Period

Accounts of excursions by missionaries and naturalist-travelers along the east coast of Kaua‘i during the first half of the nineteenth century make no specific reference to Waipouli. These accounts may reflect a general destituteness within the area, the result of shifts in population that had taken place on Kaua‘i in response to the stresses—including disease and commerce—of post-Contact life. J. W. Coulter, in his study based on the missionary censuses, comments that by the mid-nineteenth century “on the east coast of Kauai nearly all the people lived in Ko‘olau Wailua [just south of the current project area] and in the vicinity of Nāwiliwili Bay” (Coulter 1931:15). A map of Kaua‘i in Coulter’s study, showing population distribution in 1853, indicates that no single area from Olohena to Kapa‘a contained a population much greater than fifty. This may reflect an ongoing migration of people from more remote, though formerly well-populated, areas to the population centers of the mid-nineteenth century.

Few Westerners visited the Waipouli and Olohena areas in the years just after Cook’s arrival; hence detailed descriptions of the area are scarce. Most of the voyagers during the late eighteenth and early nineteenth centuries landed at Waimea, on the southwestern side of the island, a location that would eventually overshadow Wailua (just south of Olohena and Waipouli) in its royal importance because of the opportunities there to associate and trade with foreigners (Lydgate 1920).

In 1793, Wailua was still the “capital” of Kaua‘i and Capt. George Vancouver, who had already visited the island several times under Capt. James Cook and later on his own, knew this fact well and tried to land there in March. Although conditions prevented him from anchoring, Vancouver observed the area from off shore and gave this description:

> This part seemed to be very well watered, as three other rapid small streams were observed to flow into the sea within the limits above mentioned. This portion of Attouai [Kaua‘i], the most fertile and pleasant district of the island, is the principal residence of the King, or, in his absence, of the superior chief, who generally takes up his abode in an extensive village, about a league to the southward of the north-east point of the island. Here Enemo the regent, with the young prince Tamooerrie, were now living… [Vancouver 1798:221–222].

The missionary Hiram Bingham passed through Wailua twice in 1824 and visited a place not far from the birthplace of King Kaumuali‘i (pōhaku ho‘ohānau), a *hōlua* slide (ancient sledding course) and the lower falls (Wai‘ehu) on the South Fork of the river, but left no clues as to the size or extent of the settlement there (Bingham 1847:220, 231).

3.2.2 Mid- to Late Nineteenth Century

3.2.2.1 Land Leases and Agriculture

During this time period, there were indications that the Kapa‘a/Waipouli area was being considered for new sugarcane experiments, similar to those occurring in Kōloa. In a historic move, Ladd & Company received a 50-year lease on land in Kōloa from Kamehameha III and Kaua‘i Governor, Kaikio‘ewa. The terms of the lease allowed the new sugar company “the right of someone other than a chief to control land” and had profound effects on “traditional notions of land tenure dominated by the chiefly hierarchy” (Donohugh 2001:88). In 1837, a very similar lease with equivalent terms was granted to Wilama Ferani, a merchant and U.S. citizen based in Honolulu (Hawaii State Archives 1837). The lease was granted by Kauikeaouli (Kamehameha III) for the lands of Keālia, Kapa‘a, and Waipouli for twenty years for the following purpose:

> For the cultivation of sugar cane and anything else that may grow on said land, with all of the right for some place to graze animals, and the forest land above to the top of the mountains and the people who are living on said lands, it is to them whether they stay or not, and if they stay, it shall be as follows: They may cultivate the land according to the instructions of Wilama Ferani and his heirs and those he may designate under him… [Hawaii State Archives 1837].

Unlike Ladd & Company, which eventually became the Kōloa Sugar Company, there is no further reference to Wilama Ferani and his lease for lands in Kapa‘a, Keālia, and Waipouli. In a brief search for information on the Honolulu merchant, Wilama Ferani, nothing was found. It is thought that perhaps Wilama Ferani may be another name for William French, a well-known Honolulu merchant who is documented as having experimented with grinding sugarcane in Waimea, Kaua‘i at about the same time the 1837 lease for lands in Kapa‘a, Keālia, and Waipouli was signed (Joesting 1987:152).

In 1876, Captain James McKee and his son-in-law, Colonel Z. S. Spaulding, bought the Ernest Krull Cattle Ranch for the sum of $30,000.00. The first large-scale agricultural enterprise in Kapa‘a began on this property in 1877 by the two men and by the society, the *Hui Kawaihau* (Dole 1916:8). The *Hui Kawaihau* was originally a choral society begun in Honolulu whose membership consisted of many prominent people, both Hawaiian and *haole*. It was Kalākaua’s thought that the *Hui* members could join forces with Makee, who had previous sugar plantation experience on Maui, to establish a successful sugar corporation on the east side of Kaua‘i. Captain Makee built a mill in Kapa‘a and agreed to grind cane grown by *Hui* members. Kalākaua declared the land between Wailua and Moloa‘a, the Kawaihau District, a fifth district, and for four years, the *Hui* attempted to grow sugarcane at Kapahi, on the plateau lands above Kapa‘a. In the last quarter of the nineteenth century, the upper reaches of Waipouli were also planted in sugarcane by the Makee Sugar Company of Keālia. After a fire destroyed almost half of the *Hui*’s second crop of cane and the untimely death of one of their principal advocates, Captain James Makee, the *Hui* began to disperse; property and leasehold rights passed on to Makee’s son-in-law and the new Makee Plantation owner, Colonel Z. S. Spalding (Dole 1916:14; Cook 1999:51).

Sometime after 1886, but before the turn of the century, the marshy, former taro lands in the *makai* portion of Waipouli were planted in rice; these rice fields extended into Kapa‘a where a rice mill was located.

Like most well-watered areas in Hawai‘i, rice crops began taking over former *lo‘i kalo* in the second half of the 1800s. This sharing of the land by the Chinese rice farmers and native *kalo* growers continued throughout the century. Knudsen (1991:152) visited Wailua in 1895 and wrote: “We rode through the Lihue Plantation cane fields, passed through Hanamaulu and came to the Wailua River. What a sight! The great river lay clear and placid—winding away up toward the mountains with rice fields and taro patches filling all the low lands.”

By 1935, Handy (1940:67) found no *kalo* being cultivated. The terraces had been taken up by rice, sugarcane, sweet potato, and pasture. Handy explains that, “Waipouli, Olohena (North and South), and Wailua are *ahupua‘a* with broad coastal plains bordering the sea, any part of which would be suitable for sweet potato plantings; presumably a great many used to be grown in this section. There are a few flourishing plantations in Wailua at the present time” (Handy 1940:153).

3.2.2.2 1840s Accounts of the Area

In October 1840, members of the U.S. Exploring Expedition came to Wailua and recorded the following:

> The country on this route was uninteresting, until they reached Wailua, the residence of Deborah, a chief woman of the islands, readily known as such from her enormous size, and the cast of her countenance. She has a person living with her called Olivia Chapin, who speaks English, and has learned how to extort money. Deborah has about forty men in her district; but they were absent, being employed in the mountains cutting timber to pay the tax to the king…. Wailua, (two waters) was formerly a place of some importance. It is situated on a small stream of the same name, in a barren, sandy spot [Wilkes 1845, IV:68–69].

Deborah Kapule, the former wife of Kaua‘i sovereign Kaumuali‘i, took up residence in Wailua shortly after the 1824 rebellion in which Kaumuali‘i’s son George led a revolt that was put down by forces loyal to Kamehameha II. Deborah, who remained loyal to Kamehameha, was granted lands at Wailua by Ka‘ahumanu, *kuhina nui* or regent, of the islands.

Of note in the above U.S. Expedition account is that only “about forty men” are said to live in the district. This is seemingly a major reduction in settlement from Vancouver's 1793 observation of an “extensive village.” The apparent decrease in population may be attributed to the decimation of native Hawaiians by Western-introduced diseases and possibly by a movement of people to the Waimea area, which by 1840 had become the center of trade and politics on Kaua‘i.

The U.S. Exploring Expedition then traversed the coastline on horseback heading north from Wailua:

> The country on the way is of the same character as that already seen. They passed the small villages of Kuapau [Kapa‘a], Keālia, Anehola, Mowaa, and Kauharaki, situated at the mouths of the mountain streams, which were closed with similar

> sand-bars to those already described. These bars afforded places to cross at, though requiring great precaution when on horseback. The streams above the bars were in most cases, deep, wide, and navigable a few miles for canoes. Besides the sugarcane, taro, etc., some good fields of rice were seen. The country may be called open; it is covered with grass forming excellent pasture-grounds, and abounds in plover and turnstones, scattered in small flocks [Wilkes 1845, IV:69].

In 1849, a son of a Wai‘oli missionary, William P. Alexander, recorded a trip he took around Kaua‘i. Although he focuses on the larger mission settlements like Kōloa and Hanalei, he does mention the area from Wailua to Kapa‘a. The following are excerpts from Alexander’s trip on May 4–5, 1849:

> May 4…. About eight o-clock [P.M.] we arrived on the banks of the Wailua river. After calling for some time, a canoe came from the other shore, and took us over. A native led our horses over the sand bar. We were then welcomed by Deborah, the chiefess of the place, to her hospitable mansion. When she was informed that I was Alakanakela’s son, what alohas, shaking of hands, & wailing! Before we retired to rest, I engaged a horse from Deborah to go the remainder of the journey to Waioli.
>
> May 5. This morning we rose early. While the natives were getting the horse, I walked along the banks of the Wailua river. This noble stream, deep enough within the bar to float a vessel of considerable size, and it was broader than any stream that I had seen on the other islands. We did not remain here long, but got under way as soon as possible. A few miles from Wailua, near Kapa‘a we passed the wreck of a schooner on the beach, which once belonged to Capt. Bernard. It was driven in a gale over the reef, and up on the beach, where it now lies. A few miles further we arrived at Keālia. We had some difficulty crossing the river at this place, owing to the restiveness of our horses. The country here near the shore was rather uninviting, except the valley which always contained streams of water [Alexander 1991:123].

In later years, the notorious Kapa‘a reef was to become the location of many shipwrecks, particularly once a landing was built there in the 1880s.

3.2.2.3 The Māhele

The Organic Acts of 1845 and 1846 initiated the process of the *Māhele*—the division of Hawaiian lands—which introduced private property into Hawaiian society. In 1848, the crown, the Hawaiian government, and the *ali‘i* received their land titles. The common people (*maka‘āinana*) began to receive their *kuleana* awards (individual land parcels) in 1850. It is through records for LCAs generated during the Māhele that the first specific documentation of life in the Līhu‘e Basin, as it had evolved up to the mid-nineteenth century, come to light. LCAs awarded near the project area are shown in Figure 7.

3.2.2.3.1 Waipouli

At the time of the Great Māhele, William C. Lunalilo (the future king) was awarded the entire *ahupua‘a* of Waipouli (Grant 8859B:42) along with Kāhili, Kalihiwai, Pīla‘a, Manuahi,

Kamalomalo‘o, and Kumukumu. LCA records (www.waihona.com) reveal an additional 11 individual *kuleana* awards (many of which are divided into two detached plots, or *lele*) within the *makai* portion of Waipouli (Table 2, see Figure 7). An 1872 map by James Gay delineating the boundaries of Kapa‘a and adjacent lands shows that much of this *makai* region of Waipouli was a “swamp” that extended into and across the southeast *makai* portion of Kapa‘a (Figure 8). A 1929 map by R. Lane (traced from an M. D. Monsarrat map based on an 1886 survey) charts the disposition of the 11 LCAs in Waipouli (Figure 9). Seven of the awards included separate *‘āpana* for taro *lo‘i* and *pāhale*. *Kula* and *lo‘i* associated with these awards were located within and adjacent to the extensive swamp in the *makai* region of Waipouli. This swamp, perhaps the site of a former fishpond, appears to be the most pervasive natural feature of the seaward end of Waipouli. Peter H. Buck (1964) describes how the marsh areas would have been utilized: “Wet taro planting took place along the banks of streams and in swamps where the mud was heaped up into mounds.”

Table 2. Land Commission Awards within Waipouli

LCA no.	Claimant	*‘Ili* of *Ahupua‘a*	Land Use	No. of *‘Āpana* (lots)
3560	Kauakahi	Pua/Puaa Puuiki (award in Wailua)	three *lo‘i*, *kula*, house lot	
3622	Kamaholelani Kukaeuli	Makamakaole Village	three *lo‘i* and *kula*; house lot	one (two acres, one rood, three rods); one (one rood, two rods)
3624	Kaumiumi	Pōhaku Makamakaole Village	three *lo‘i* and small *kula*; house lot	one (three roods, 38 rods); one (one rood, eight rods)
3639	Kapalahua and Nalopi	Kekee Kanalimua Village	three *lo‘i* and uncult. kula, house lot	one (three rods)
3971	Honolii	Kahana; lele in Kapa‘a Ahupua‘a	living at Waipouli	
7636	Kanaka	Mokuapi Makahokoloko Village	three (or five) *lo‘i*, house lot	two (three rods, 27 rods)
8559B	Kanaina, C. for Lunalilo	Waipouli Ahupua‘a	revenue	*‘Āpana* 42
8836	Kaalihikaua	Kaheloko	two *lo‘i*, *kula*, *wauke*, pigpen, house lot	one (one acre, eight rods)
8838	Kahukuma	Pini	two *lo‘i*, *kula*, and house lot	one (1.5 acres, 37 rods)
8839	Kuaiwa	Hape Mokanahala / Mokunahala Village	four *lo‘i* and small *kula*; house lot	one (three rods, 13 rods); one (one acre, one rood, one rod)
9013	Nawaimakanui Kawaimakanui	Naohe Uahalekakawawa	three *lo‘i*; house lot	one (one acre, 12 rods); one (one rood, 27 rods)
10146	Mahi	Pau Paikahawai	three *lo‘i* and small *kula*; house lot	one (one acre, 17 rods); one (one rood)

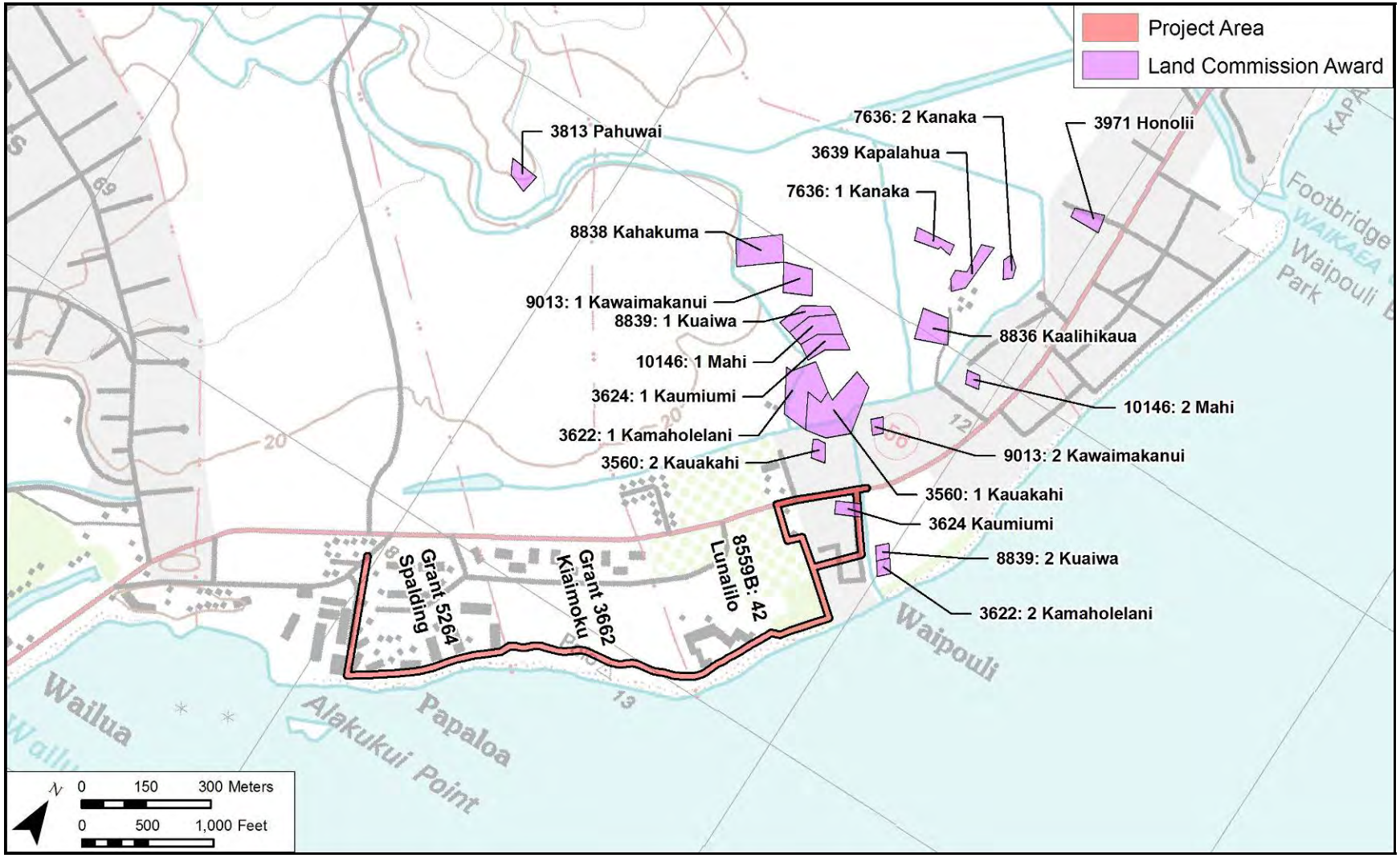

Figure 7. LCAs near the project area (base map: 1996 U.S. Geological Survey 7.5-minute topographical map, Kapa‘a quadrangle)

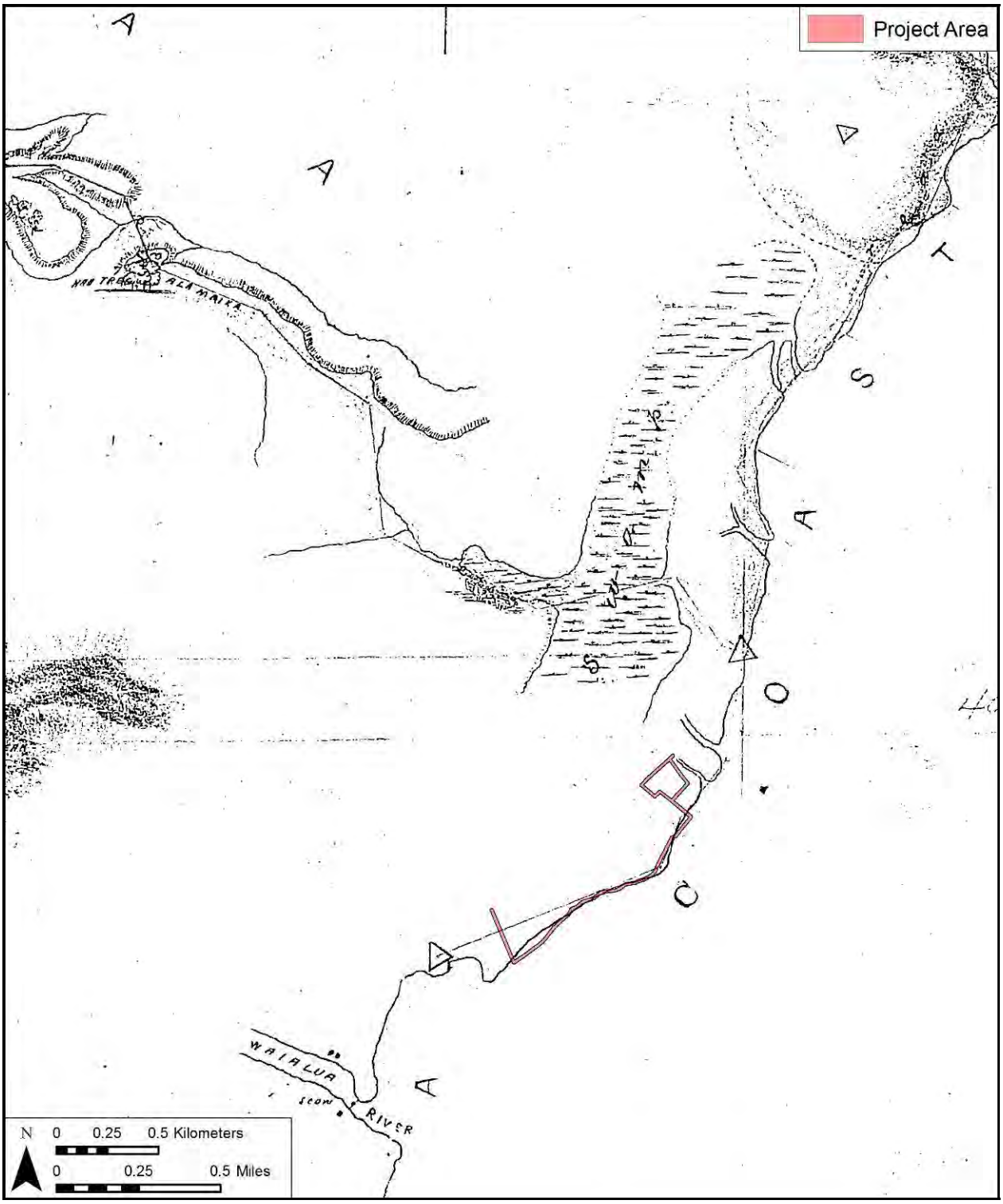

Figure 8. Portion of 1872 Government Survey map by James Gay showing *makai* marshland in Waipouli (rough estimates of *ahupua‘a* boundaries at shore added) (RM 159)

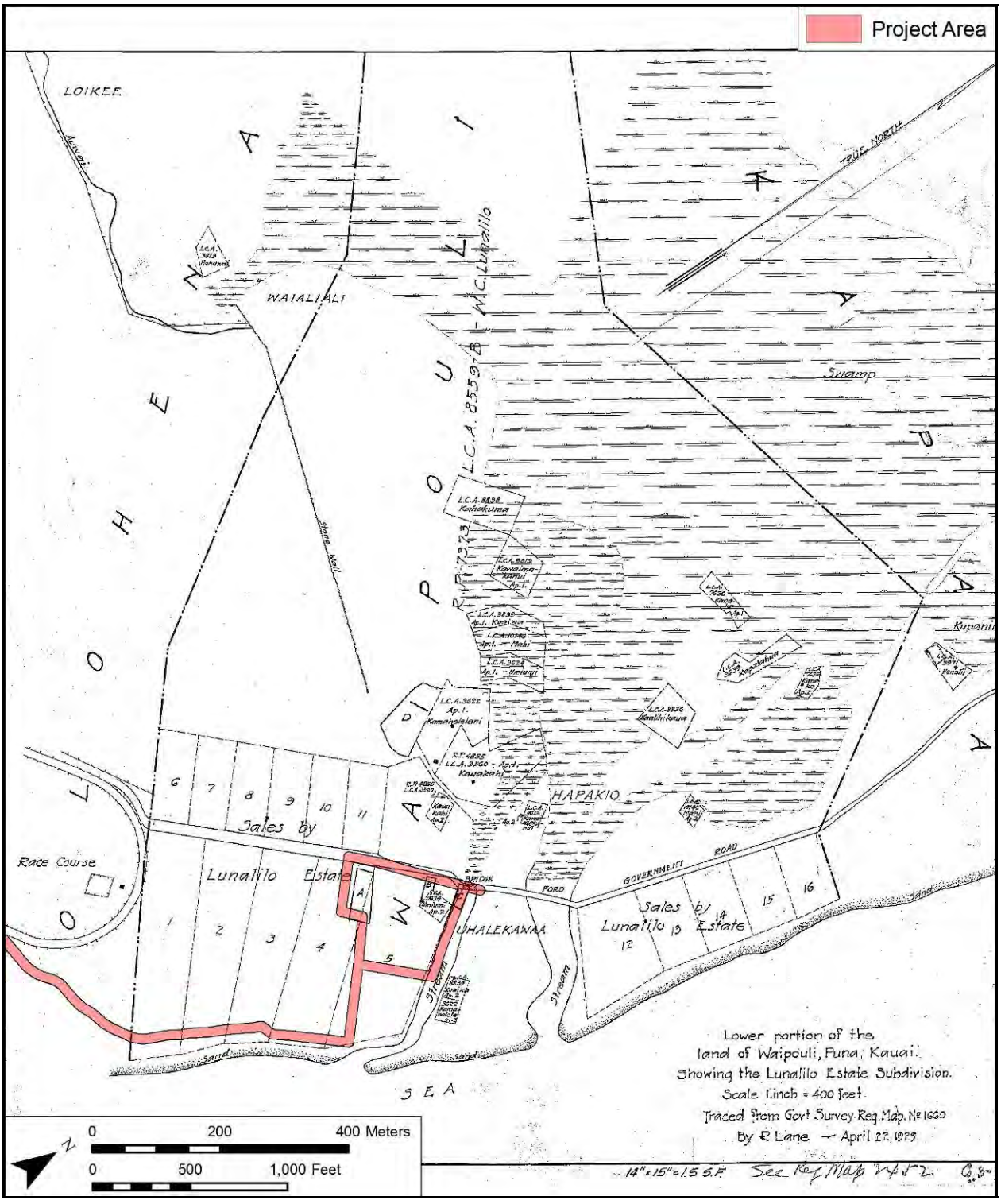

Figure 9. Portion of 1929 Government Survey map traced by R. Lane based on an 1892 M. D. Monsarrat survey showing *makai* portion of Waipouli and locations of LCAs (RM 1660)

3.2.2.3.2 North and South Olohena

North Olohena was acquired by Kiaimoku (Grant 3662) and South Olohena was acquired by Rufus P. Spalding (Grant 5264).Only one *kuleana* parcel was awarded within the *makai* portion of these *ahupua‘a*, and it is located in North Olohena (Table 3, see Figure 7).

Table 3. LCAs and Land Grants within North and South Olohena

LCA/Land Grant Number	**Claimant**	***‘Ili* of *Ahupua‘a***	**Land Use**	**No of *‘Āpana***
3662	Kiaimoku	North Olohena Ahupua‘a		
3813	Pahuwai	Kuanea	four *lo‘i* and house lot	one (two rods)
5264	Rufus P. Spalding	South Olohena Ahupua‘a		

A 1914 map by Walter E. Wall traced from a Government Survey Map by Jos. Iao (Figure 10), along with Lane’s 1929 LCA map of a portion of Olohena (see Figure 9), and the 1996 US Geological Survey map showing the locations of LCAs (see Figure 7) together show North Olohena made up mostly of Kiaimoku’s grant, with a small *kuleana* award to Pahuwai, and South Olohena made up of Grant 5264 to Rufus P. Spalding for Lihue Plantation. The one *kuleana* award is inland on Konohiki Stream (LCA 3813). Pahuwai, the single claimant in both Olohena, had two parcels, one in Olohena ‘Ili and one in Kuanea ‘Ili (not shone on maps), and he lived and worked his *lo‘i* there. He was awarded one parcel, but all that he claimed was included in the award. Pahuwai’s award is near the Waipouli boundary at the edge of marshland called “Waialiali,” and Pahuwai was not far from his nearest neighbors, the most inland Waipouli claims.

Some cultural information can be derived from the 1875 Boundary Commission report. Before that, in the Māhele Awards, we know that Kiaimoku relinquished half of Olohena and retained half, and purchased Grant 3662 of 403 acres. Interior Department Book 15 (Hawaii 1830–1916:109) shows Kiaimoku had .60 miles of seacoast. Another Interior Department Document, dated June 28, 1850, shows Kiaimoku offering to exchange his Olohena land for Moloa‘a land. However Kiaimoku died in October of 1851 and no further documentation is found regarding this land (Barrère 1994:365).

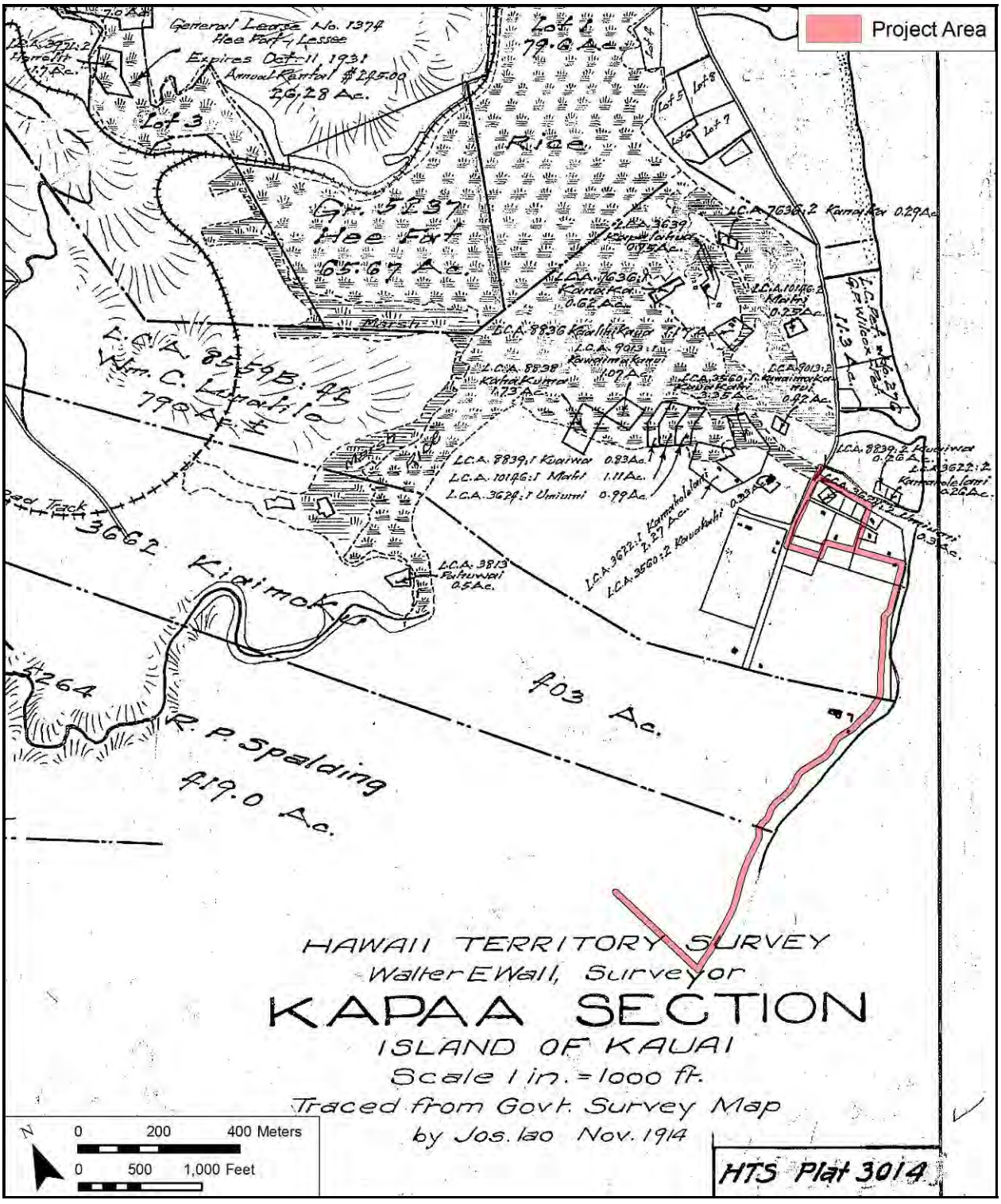

Figure 10. Portion of 1914 Government Survey, W. E. Wall map of Kapaa Section, (HTS Plat 3014)

3.2.3 Twentieth Century to the Present

3.2.3.1 Sugar Plantations

According to Edward Joesting, after 1898, with the influx of American citizens to Hawai‘i, real estate values rose and sugar plantation increased:

> The result was a leap in real estate values and in the value of personal property. Total collected real estate taxes for Kauai and Niihau in 1898 were $27,341, and collected taxes on personal property were $37,571. In 1900, when Hawaii was securely in U.S. hands, collected taxes on personal property had leaped to $69,432…
>
> Mechanical advances meant increased sugar acreage for Hawaii‘s farmers, and brought the industry to a point where a new kind of expansion was practical. The expansion took the form of a new kind of cooperative, starting in 1906 with the purchase of a large refining factory in Crockett, California. The refinery was located on San Pablo Bay, north of Oakland, where ships carrying raw sugar from Hawaii docked at the piers next to the refinery.
>
> The cooperative, named California and Hawaiian Sugar Refining Corporation, not only processed an increasing amount of Hawaii’s raw sugar as the years passed, but also marketed the sugar under the C and H label [Joesting 1987:262–264].

C and H sugar remains a popular brand of sugar today, but their sugar is no longer produced in Hawai‘i.

On Kaua‘i, in the Wailua to Kapa‘a area during the late-1800s and early 1900s, the primary sugar plantations were Makee Sugar Company, Kealia Plantation, and Hui Kawaihai. By 1934, the Lihue Plantation Company absorbed the Ahukini Terminal & Railway Company and Makee Sugar Company, the last of the Wailua area plantations (Condé and Best 1973:167; Hawaiian Sugar Planters’ Association 1925). The railway and rolling stock formerly owned by Makee Sugar Company became the Makee Division of the Lihue Plantation. At this time, in addition to hauling sugarcane, the railroad also was used to haul plantation freight, including “fertilizer, etc. …canned pineapple from Hawaiian Canneries to Ahukini and Nawiliwili, pineapple refuse from Hawaiian Canneries to a dump near Anahola, and fuel oil from Ahukini to Hawaiian Canneries Co., Ltd.” (Hawaiian Territorial Planning Board 1940:11). Former plantation workers and *kama‘āina* growing up in Kapa‘a remember when the cannery sent their waste to the pineapple dump, a concrete pier just north of Kumukumu Stream by railroad. The structure is built over the water where the rail cars would dump the pineapple waste. The current carried the waste to Kapa‘a, where the waste attracted fish and sharks (Bushnell et al. 2002).

Lihue Plantation was the last plantation in Hawai‘i to convert from railroad transport to trucking. “By 1957 the company was salvaging a part of their plantation railroad, which was being supplanted by roads laid out for the most part on or close to the old rail bed” (Condé and Best 1973:167). By 1959, the plantation had completely converted to trucking.

3.2.3.2 Waipouli Beach

By the 1920s Waipouli Beach, had become a polo ground, where Major George Patton, with his army team, beat a local team. Charles I. Fern, piloting the first plane to Kauai in the 1920s, landed his plane in the same polo field (Beacon 1971:21).

In the 1970s, a rule forbidding high-rise development throughout Kaua‘i was passed, due in part to increased inter-island plane travel, which in turn paved the way for more development on the island (Beacon 1971:20). By the end of the twentieth century it was noted that, “the backshore of Waipouli Beach is lined with long rows of tall ironwood trees. A shoreline pedestrian trail is used by strollers and joggers…. Although most of the Waipouli shoreline is developed or privately owned, six public rights of way provide access to the beach. They are all marked and easy to locate” (Clark 1990:9).

3.3 Previous Archaeological Research

Several previous archaeological studies have been conducted in the vicinity of the current project area along the coastline of South Olohena, North Olohena, and Waipouli Ahupua‘a. Table 4 outlines the previous archaeological studies that involved some type of field work, while the locations of the studies are depicted in Figure 11. Locations of historic properties identified during previous archaeological research are depicted in Figure 12. The following is a summary of the archaeological studies.

3.3.1 Kukui Heiau – Thrum 1906; Bennett 1931; Davis and Bordner 1977

Archaeological surveys conducted by Thomas G. Thrum (1906), Wendell C. Bennett (1931), and later by Davis and Bordner (1977) documented Kukui Heiau (SIHP # 50-30-08-108), located on Alakukui Point at the northern edge of Wailua Bay in South Olohena Ahupua‘a about 300 ft west of the project area. This walled heiau, approximately 85 ft in width by 196 ft in length, contained an internal enclosure, with a four-ft-wide passageway between the eight-ft-thick outside walls and the five-ft thick inside walls, and was likely paved throughout. The eastern walls were five ft thick, the north wall measured 11 ft across, and the sea wall was 16 to 22 ft across, with great slabs of lava set on edge and filled with smaller stones (Bennett 1931:127; Thrum 1906:41). Kukui Heiau served as a navigational heiau with at least two stone lamps lit along its *makai* edge that guided canoes travelling offshore at night (Carpenter and Yent 1997:8). Kukui Heiau was placed on the Hawai‘i Register (1986) and the National Register of Historic Places (1987).

3.3.2 Coconut Plantation Parcels—Rosendahl and Kai 1990; Toenjes et al. 1991; Dega et al. 2005; Wilson and Dega 2006

In 1990, Rosendahl and Kai conducted an AIS of two parcels located along the northeast coast of North Olohena Ahupua‘a. They identified two historic properties (SIHP # 50-30-08-1800 and SIHP # 50-30-08-1801), one in each land parcel.

Rosendahl and Kai (1990) documented two cultural layers and three burials (SIHP # 50-30-08-1800) within the shoreline sand berm at Coconut Plantation in North Olohena Ahupua‘a. This cultural layer extends into the current project area. An upper cultural deposit (Layer I) was

Table 4. Summary of previous archaeological studies in the vicinity of the current project area

Reference	Location	Type of Study	Findings
Thrum 1906	South Olohena Ahupua‘a, Alakukui Point— Kukui Heiau	Heiau Study	SIHP # 50-30-08-108, Kukui Heiau
Bennett 1931	Island-wide; Kukui Heiau	Archaeological Reconnaissance Survey	SIHP # 50-30-08-108, Kukui Heiau
Bordner and Davis 1977	South Olohena Ahupua‘a, Alakukui Point— Kukui Heiau	Archaeological Investigation	SIHP # 50-30-08-108, Kukui Heiau
Rosendahl and Kai 1990	North Olohena and Waipouli Ahupua‘a, *makai* of Kūhiō Highway—Coconut Plantation	Archaeological Inventory Survey	SIHP # 50-30-08-1800, 2 cultural layers and 3 burials; SIHP # 50-30-08-1801, 2 cultural layers and 5 burials
Folk, Chiogioji, McDermott and Hammatt 1991	Waipouli Ahupua‘a, *makai* of Kūhiō Highway—Waipouli Beach Resort/Golding Property	Archaeological Survey and Subsurface Testing	SIHP # 50-30-08-1836, cultural layer and 8 burials
Hammatt 1991	North Olohena and Waipouli Ahupua‘a, Kapa‘a sewer line	Archaeological Subsurface Testing	SIHP # 50-30-08-1836, cultural layer; SIHP # 50-30-08-1848, cultural layer
Shun 1991	Waipouli Ahupua‘a, *makai* of Kūhiō Highway	Archaeological Subsurface Testing	No significant findings
Toenjes Chiogioji, Folk and Hammatt 1991	South Olohena Ahupua‘a, *makai* of Kūhiō Highway—Coconut Plantation	Results of Archaeological Data Recovery	SIHP # 50-30-08-1801, re-identified two known burials (no new burials found) and identified a workshop area and permanent habitation

Reference	Location	Type of Study	Findings
Hammatt 1992	Waipouli Ahupua‘a, *makai* of Kūhiō Highway—Waipouli Beach Resort/Golding Property	Addendum to Archaeological Survey and Subsurface Testing (Folk et al. 1991)	SIHP # 50-30-08-1836, 3 additional burials
Hammatt and Folk 1992	Waipouli Ahupua‘a, *mauka* of Kūhiō Highway	Archaeological Subsurface Testing	No significant findings
Spear 1992	South and North Olohena Ahupua‘a, Kūhiō Highway, and Wailua Ahupua‘a, *makai* of Kūhiō Highway	Archaeological Subsurface Testing	No significant findings
Creed et al. 1995	Waipouli Ahupua‘a, along Kūhiō Highway	Archaeological Monitoring Report	SIHP # 50-30-08-872, 4 burials, within SIHP # 50-30-08-1848, cultural layer
Hammatt Chiogioji, Ida and Creed 1997	Wailua, South Olohena, North Olohena, and Waipouli Ahupua‘a, *mauka* of Kūhiō Highway	Archaeological Inventory Survey	No significant findings near project area; SIHP # 50-30-08-756, terrace, located north of Wailua River (not located near project area);
Hammatt, Shideler, Winieski and Perzinski 2000	Waipouli Ahupua‘a, *makai* of Kūhiō Highway—Waipouli Beach Resort/Golding Property	Archaeological Data Recovery Report	SIHP # 50-30-08-1836, extensive midden, artifacts, features, 3 additional burials
Ida, Shideler and Hammatt 2000	Waipouli Ahupua‘a, *makai* of Kūhiō Highway—Waipouli Beach Resort/Golding Property	Documentation of Burial Disinterment	SIHP # 50-30-08-1836, 1 additional burial

Reference	Location	Type of Study	Findings
Perzinski, Shideler and Hammatt 2001	South Olohena Ahupua‘a, northeast coast	Archaeological Monitoring Report	SIHP # 50-30-08-791, cultural layer and 2 burials
Dega and Powell 2003	Moloa‘a to Hanama‘ulu, Kūhiō Highway	Archaeological Monitoring Report	Ten sites identified, but only one, SIHP # 50-30-08-886 is near the project area; The site consists of a cultural layer, possible *‘auwai*, and 2 burials (designated 886A)
Hammatt and Shideler 2004	South Olohena Ahupua‘a, *mauka* of Kūhiō Highway	Archaeological Assessment	SIHP # 50-30-08-823, railroad culvert; SIHP # 50-30-08-890, grind stones; SIHP # 50-30-08-891, WWII bunker
Dega, Spear and Powell 2005	North Olohena and Waipouli Ahupua‘a, *makai* of Kūhiō Highway	Archaeological Inventory Survey	SIHP # 50-30-08-1801, additional features including pits, post molds, fire pits, portions of cultural layer, human burials, lithics, midden, and charcoal
Dega and Dagher 2006	0.440-acre coastal parcel, Waipouli area, North Olohena Ahupua‘a	Archaeological Inventory Survey	SIHP # 50-30-08-3938, a cultural layer, and SIHP # 50-30-08-3939, two Hawaiian burials
Morawski and Dega 2006	0.440-acre coastal parcel, Waipouli area, North Olohena Ahupua‘a	Monitoring Plan	No field work, but contains radiocarbon dating results from Dega and Dagher 2006
Wilson and Dega 2006	11.768 Coconut Plantation 11.783 acre Lot 6, Waipouli	Data Recovery Report	SIHP # 50-30-08-1801, pre-Contact and historic subsurface deposit with five previously identified burials.

Reference	Location	Type of Study	Findings
Tome, Cordle and Dega 2007	Waipouli 0.3295 Coastal Parcel	Archaeological Data Recovery	SIHP # 50-30-08-5003, a pre-Contact habitation hearth and pit and SIHP # 50-30-08-5004, a pre-Contact/early historic Hawaiian burial.
McCurdy, Runyon and Hammatt 2009	Waipouli Ahupua‘a, *makai* of Kūhiō Highway—Waipouli Beach Resort/Golding Property	Archaeological Monitoring Report	SIHP # 50-30-08-1836, 47 additional burials and 396 additional artifacts
Potter and Dega 2012a	Waipouli Waterline Replacement Project Phase I, Kapa‘a and Waipouli		SIHP # 50-30-08-2152 four subsurface features; SIHP # 50-30-08-2153 three subsurface features; SIHP # 50-30-08-2154 discrete charcoal lens
Potter and Dega 2012a	Waipouli Waterline Replacement Project Phase II, Kapa‘a		No significant findings

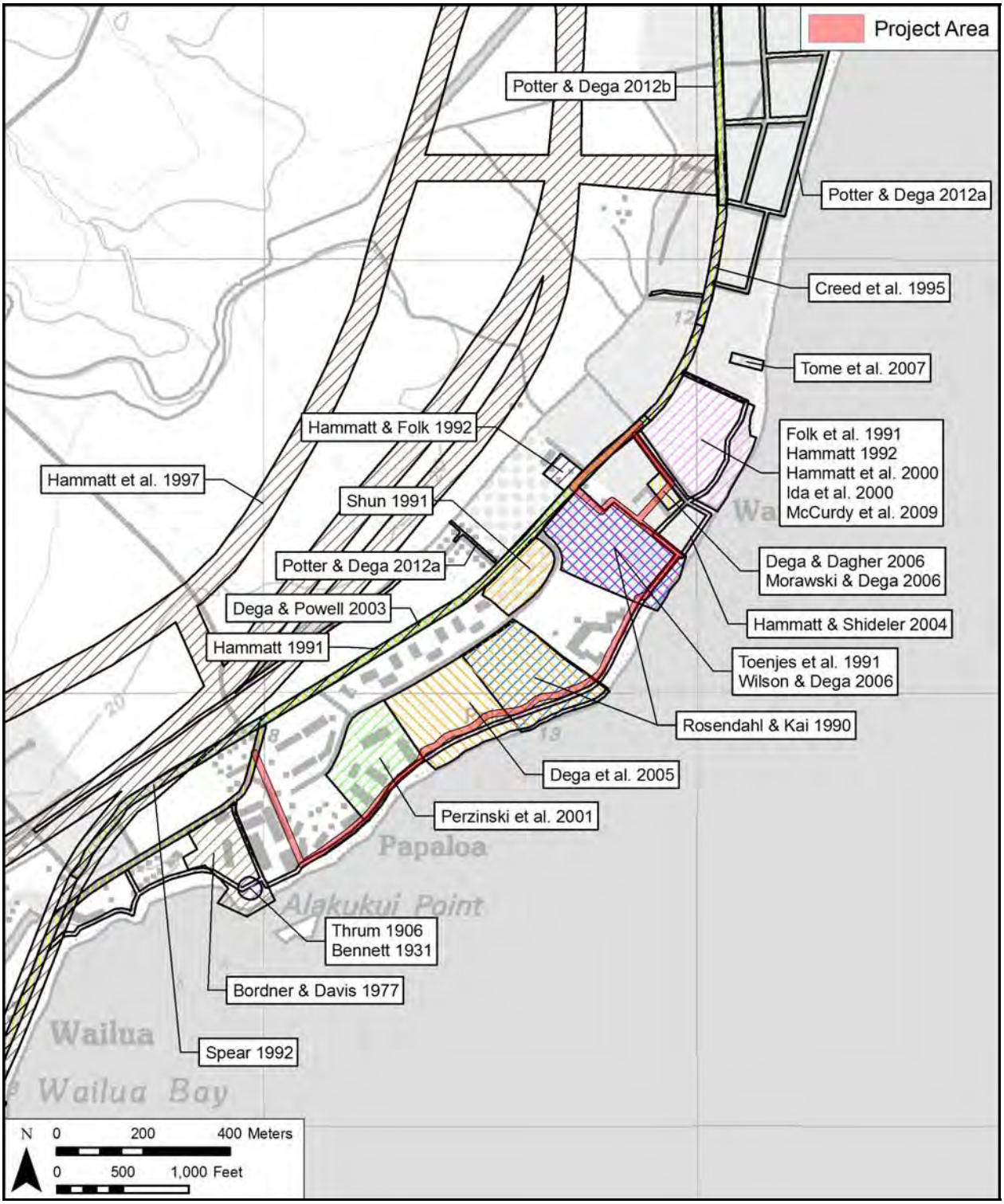

Figure 11. Previous archaeological studies in in the vicinity of the project area in Waipouli, North Olohena, and South Olohena Ahupua‘a (U.S. Geological Survey 1996 Kapa‘a Quadrangle)

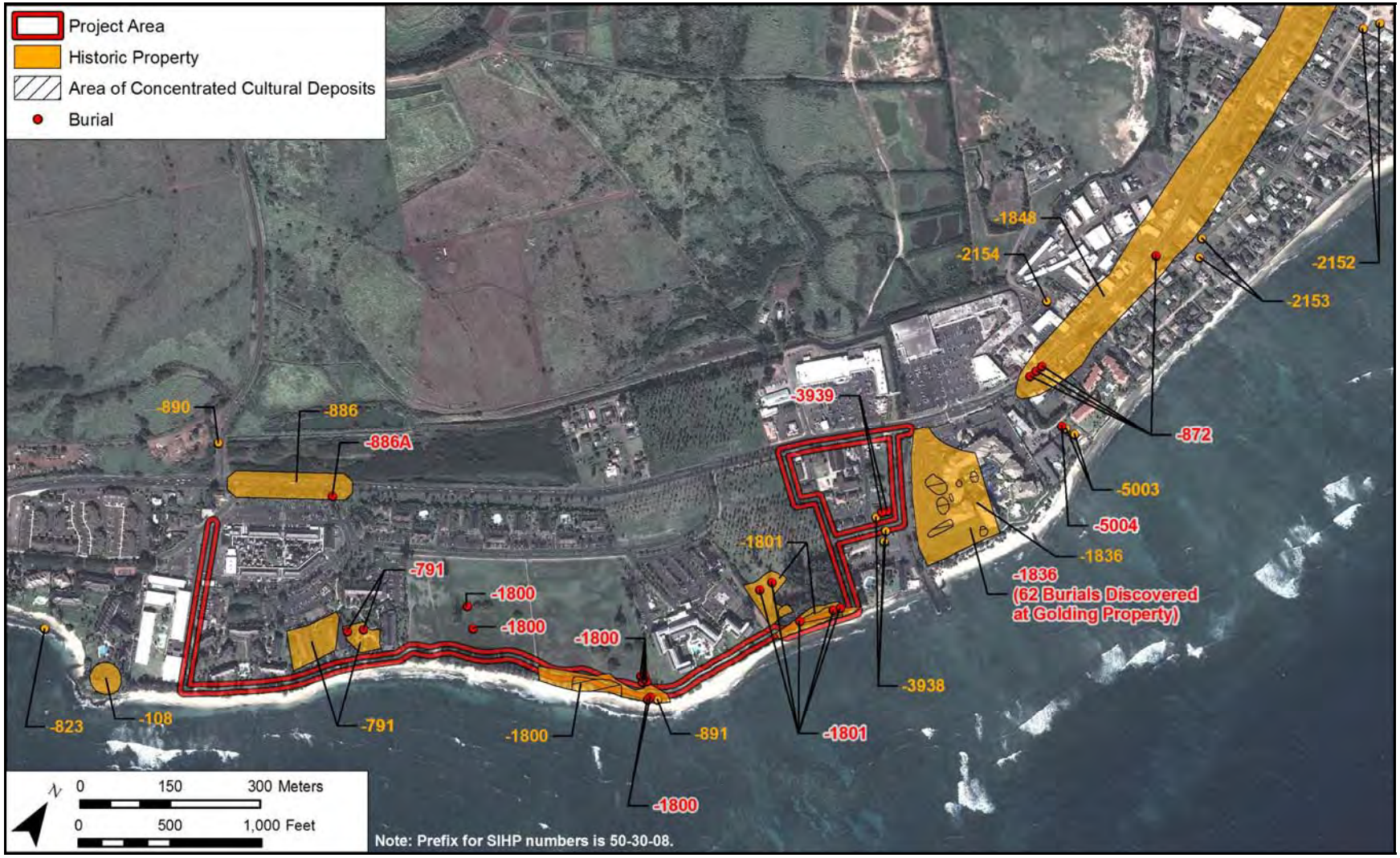

Figure 12. Historic properties (including burials) found in the vicinity of the project area (GoogleEarth 2010)

documented that extends about 25 to 80 ft inland from the shore, with shell midden, fish bone, charcoal fragments, ash, fire-cracked rock, several pit features, and six historic-era artifacts, including two ceramic bowl sherds and four glassware shards. A lower cultural deposit (Layer II) was documented that extends about 40 to 100 ft inland from the shoreline, with small amounts of shell midden, charcoal flecks, fire-cracked rocks, several pits, and 11 artifacts, including tools, flaked stones, modified bone, and cut shells. Both cultural layers are richer in midden content in a concentrated central area. Three burials were uncovered in the northeastern section of the cultural layer near the coast and left in place. The extensive nature of the cultural deposits and relative lack of artifacts suggests that the area was used for recreation or for social gatherings. Radiocarbon dating places occupation at the site from AD 1270 to 1954, but Rosendahl and Kai (1990:13) note that these dates "should be viewed with some caution." Volcanic glass hydration-rind dating indicates occupation between AD 1496 and 1556 (Rosendahl and Kai 1990:13).

Farther north up the coast, in a second parcel of land, Rosendahl and Kai (1990) documented two cultural layers and five burials (SIHP # 50-30-08-1801) within the shoreline sand berm at Coconut Plantation in Waipouli Ahupua‘a. The documented cultural layers extend into the current project area, and several burials are located immediately south of the project area. The upper cultural layer, Stratum II, covered an area of 325 square meters (m^2) and averaged 40 cm in thickness. Cultural deposits extended about 65 to 95 ft inland from the shoreline, and are also located in a discontiguous inland area. The cultural layers contained shell midden, fish and mammal bone, charcoal fragments, fire-cracked rock, several pit features, and artifacts. The midden consisted mostly of shellfish, with small quantities of fish, avian, and terrestrial remains, that has been radiocarbon dated to approximately AD 1500. Numerous indigenous artifacts (2,886) included basalt flakes, adze fragments, hematite flakes, volcanic glass, coral and urchin spine tools, files, abraders, fishhooks, shell beads, several bone awls or picks, flaked and modified stone, and cut and modified shell and bone. Of particular note is that the bone from one pick was that of an Audubon Shearwater (*Puffinus herminierie*), thought to have become extinct prior to the Contact-era (Rosendahl and Kai 1990).

This was a site of habitation with significant hearth and pit features, large quantities of midden representing a more varied diet, and artifacts representing a variety of activities, including woodworking, stone tool production, fishhook manufacture, fishing, food preparation, and consumption. Five burials were observed and left in place; three were located in shoreline deposits and two in the inland extension (Rosendahl and Kai 1990).

Subsequent data recovery at the site was performed by Toenjes et al. (1991). The data recovery identified the smaller lower cultural layer (Stratum IIa), which covered a more limited area of 10–20 m^2 and was 10–15 cm thick. The layer contained an abundance of hematite flakes and shattered debris, connected to the production of fishing line sinkers and possibly cutting tools, and an abundance and variety of shell, bone, coral, and sea urchin artifacts, associated with fishing. This lower cultural layer was likely a site that was used as a workshop for manufacturing fishing gear. The workers of Stratum IIa preferred modified bone over shell as source materials for their fishhook manufacture, a pattern that shifted to shell material in Stratum II.

Toenjes et al. (1991:88) summarily state that "A sequence of occupation developing from a limited workshop area to a site of permanent occupation has been preserved in the records of stratigraphy and material culture." Stratum IIa indicates that the site initially served as a small

discrete center for few people in about AD 1400 for the specialized production of fishhooks and fishing-related tools. Stratum II indicates that there was an abrupt shift to a period of more generalized habitation and generalized activities of a "well-populated thriving community whose vigor may have been established upon and been a continuation of the 'tradition' created by the energies of the original lone craftsmen" (Toenjes et al. 1991:96).

An archaeological inventory survey at the 20.81-acre northern Coconut Plantation parcel was conducted by Scientific Consultant Services (SCS) in 2005 (Dega et al. 2005). They identified 42 additional features including seven human burials, numerous pits, post molds, fire pits, portions of a traditional cultural layer, lithics, midden, and charcoal. These features were incorporated into SIHP # 50-30-08-1801. Radiocarbon dates for the project revealed use as early as the 14th century (Dega et al. 2005:ii).

A data recovery report for the 11.783-acre southern parcel of the Coconut Plantation was completed in 2006 by SCS (Wilson and Dega 2006). The purpose of the study was to conduct three tasks at SIHP # 50-30-08-1801: to disinter two of the five previously identified burials, to define the boundaries of the site, and to gather additional information on the site through excavation. The two previously identified burials, identified during the Rosendahl and Kai (1990) study, could not be relocated. The site boundary was redrawn to indicate that the area was actually smaller than the original drawn perimeter. A large amount of marine shell, bone, traditional Hawaiian artifacts, and historic artifacts were recovered from four test units and 10 shovel probes.

3.3.3 Waipouli Beach Resort/Golding Property Parcel—Folk et al. 1991; Hammatt 1992; Hammatt et al. 2000; Ida et al. 2000; McCurdy et al. 2009

A cultural layer with numerous artifacts and 62 human burials (SIHP # 50-30-08-1836) in the Waipouli Beach Resort/Golding Property at the shoreline in Waipouli Ahupua‘a immediately east of the current project area have been documented through several investigations: archaeological survey and subsurface testing (Folk et al. 1991) and addendum (Hammatt 1992), archaeological data recovery (Hammatt et al. 2000), documentation of burial disinterment (Ida et al. 2000), and an archaeological monitoring report (McCurdy et al. 2009).

The 12-acre site was once a sand island named Uhalekawa‘a that was bounded on the north and west by marsh land, on the south by Waipouli Stream, and on the east by the sea. The studies by Folk et al. (1991), Hammatt (1992), Hammatt et al. (2000), and Ida et al. (2000) identified hundreds of features, a cultural layer, and numerous artifacts. Identified features consisted of hearths, pits, charcoal concentrations, *imu*, postholes, midden scatters, a lithic reduction area, a concentration of *‘alaea* (water-soluble colloidal ocherous earth, used for coloring salt, for medicine, for dye, and formally in the purification ceremony called *hi‘uwai*), coral scatters, 47 human burials, and an animal interment. The cultural layer contained 59,741 artifacts (50,717 indigenous artifacts and 9,024 historic artifacts), including 75 fishhooks or fragments, four tattoo needles, one basalt slingstone, a cache of limestone slingstones in various stages of completion, a basalt slingstone, a shell necklace (burial good), eight perforated boar tusks (burial goods), two carved stone effigy bowls (burial goods) (see Ida et al. 2000), basalt adzes and preforms, polished flakes, hammerstones, bone picks, coral abraders and files, sea urchin files, a shell grater, and four fishing net gauges. Four of the burials contained burial goods signifying

status of the deceased (e.g., rare effigy bowls). The earliest radiocarbon dates range from AD 1280 to 1450, but widespread permanent habitation likely occurred between AD 1380 and 1550 (Hammatt et al. 2000).

The data indicate that this site was a moderate permanent settlement that may have been a staging area for fishing events involving fleets of canoes and associated feasting and religious activities, a location for the canoes' construction, repair, and storage, a location for stone, bone, and shell tool manufacture such as fishhooks and nets, a place for the preparation and consumption of food, a location for the manufacture of slingstones, and a special place for tattooing (Hammatt et al. 2000).

McCurdy et al. (2009) identified an additional 47 traditional Hawaiian burials and 396 Pre-Contact artifacts and burials goods and post-Contact artifacts. In total, 62 human burials, hundreds of features, and over 60,000 artifacts have been identified at this property.

3.3.4 Kūhiō Hwy. Sewer Line, Fiber Optic—Hammatt 1991; Spear 1992; Creed et al. 1995; Dega and Powell 2003

A cultural layer, SIHP # 50-30-08-1848, was documented during archaeological subsurface testing in Waipouli Ahupua‘a along Kūhiō Highway by Hammatt (1991). This layer contained small amounts of shell midden, fire-cracked rock, basalt flakes, charcoal, and a pit. This site was likely a permanent habitation site associated with shoreline occupation (Hammatt 1991). Four burials were later identified within this cultural layer by Creed et al. (1995) during archaeological monitoring and designated SIHP # 50-30-08-872.

Dega and Powell (2003) completed a report for the monitoring of fiber optic duct lines along Kūhiō Highway in 2003. The project area extended from Moloa‘a Ahupua‘a in the north to Hanamaulu Ahupua‘a in the south and was divided into 11 sections. Only Section 13 is near the project area; all features found in this section were designated SIHP # 50-30-08-886. The site consisted of a cultural layer, a possible *‘auwai*, and two sets of previously disturbed disarticulated human remains, which were designated SIHP # 50-30-08-886A (Dega and Powell 2003:40–44). This historic property extends into the northern end of the current project area. The cultural layer consists of an oval hearth remnant with charcoal flecking and ash indicative of a single combustion event and an *‘auwai* that may have been utilized to drain a portion of a shallow basin.

Spear (1992) conducted an archaeological subsurface testing program along Kūhiō Highway in South and North Olohena Ahupua‘a and *makai* of Kūhiō Highway within Waipouli Ahupua‘a. No significant findings were reported.

3.3.5 Shun 1991

Shun (1991) performed an archaeological subsurface testing *mauka* of Kūhiō Highway within Waipouli Ahupua‘a. No significant findings were reported.

3.3.6 Hammatt and Folk 1992

In 1992, CSH conducted an archaeological subsurface testing program of a parcel *mauka* of Kūhiō Highway in Waipouli Ahupua‘a (Hammatt and Folk 1992). No significant findings were reported.

3.3.7 Hammatt and Shideler 2004

In 2004, CSH conducted an archaeological assessment of alternative routes for the current project, the Lydgate-Kapa‘a Bike and Pedestrian Path Project (Hammatt and Shideler 2004). This work primarily included a synthesis of the pertinent literature, including previous archaeological studies. Fieldwork in the form of a pedestrian inspection was also carried out and focused on the coast in South and North Olohena and Waipouli Ahupua‘a and along the Lihue Plantation Railroad. During this inspection, three historic properties were identified: a railroad culvert (SIHP # 50-30-08-823), grind stones (SIHP 50-30-08-890), and a WWII-era bunker (SIHP 50-30-08-891).

The railroad culvert is stone and concrete and was used for drainage of a railroad bed, understood to be a portion of the Lihue Plantation Railroad Embankment (SIHP # 50-30-08-823), *mauka* of Kūhiō Highway in South Olohena Ahupua‘a. The alignment of this railroad has been virtually destroyed.

Several grind stones (SIHP # 50-30-08-890) were observed along the shoreline near the high tide line within a small bay west of Kukui Heiau in South Olohena Ahupua‘a. The grind stones consist of large boulders with both linear and circular worn depressions. These stones would have been used in traditional times to sharpen stone tools and weapons.

The WWII-era military structure (SIHP # 50-30-08-891), likely a bunker, pillbox, or machine-gun emplacement, was observed in the southeast corner of a vacant lot on the edge of the sandy shoreline in North Olohena Ahupua‘a. The structure is one of hundreds of bunkers located throughout the shorelines of the Hawaiian Islands built to defend against a coastal invasion during WWII.

3.3.8 Hammatt et al. 1997

Hammatt et al. (1997) conducted an AIS *mauka* of Kūhiō Highway in Wailua, South Olohena, North Olohena, and Waipouli Ahupua‘a. A terrace (SIHP # 50-30-08-756) was located north of Wailua River, but no significant findings were reported near the current project area.

3.3.9 Perzinski et al. 2001

A cultural layer and two burials (SIHP # 50-30-08-791) were uncovered during archaeological monitoring on the coast of South Olohena Ahupua‘a by Perzinksi et al. (2001). A portion of the cultural layer is located within the current project area, while the burials are located about 100 ft north of the project area. The cultural layer displayed a relatively high concentration of marine midden, which is suggestive of substantial fishing activity. Several artifacts were uncovered, including fishhook fragments, a cut shell fragment, a sea urchin spine file, a coral file, a coral manuport, and a broken fishhook preform, as well as such features as pits and a hearth. Perzinski et al. (2001) suggest that this site was the location of a structure, possibly

an eating house, that has been radiocarbon dated to AD 1275 to 1645. The two burials consists of an in situ human burial and isolated human remains. A 30 ft-diameter burial preserve was planned to be centered over the in situ burial.

3.3.10 Borges Property—Tome et al. 2007

In 2005, SCS (Tome et al. 2007) conducted an archaeological inventory survey of a small 0.3295 coastal parcel in Waipouli Ahupua‘a. During the excavation of eight trenches, two sites were identified, SIHP # 50-30-08-5003, a pre-Contact habitation hearth and pit, and SIHP # 50-30-08-5004, a pre-Contact/early historic Hawaiian burial. Radiocarbon analysis of charcoal from the hearth indicated an AD 1450-1660 date for the hearth. Only the cranium and femoral head of the burial were uncovered by the archaeologists, but it was assumed that the remains were part of a complete burial. The bones were left in place and the trench was refilled. The human bones were not found associated with the cultural deposit, SIHP # -5003.

3.3.11 Darcy McCartney-Scott Hansen Properties—Dega and Dagher 2006; Morawski and Dega 2006

In 2006, SCS conducted an archaeological inventory of a 0.444-acre coastal parcel in Waipouli and North Olohena Ahupua‘a (Dega and Dagher 2006). Ten backhoe trenches were excavated and two sites were identified, SIHP # 50-30-08-3938, a cultural layer, and SIHP # 50-30-08-3939, two pre-Contact/early historic Hawaiian burials, found in the beach portion of the project area. Both burials were left in place. A pit feature with charcoal and fire-cracked rocks was recorded from SIHP # -3938. The radiocarbon dating result for this feature, dated to AD 1690-1775, was first reported in a subsequent monitoring report for the property (Morawski and Dega 2006:14).

3.3.12 Waipouli Waterline Replacement Project—Potter and Dega 2012a, 2012b

For Phase I of the Waipouli Waterline Replacement Project in 2012, SCS (Potter and Dega 2012a) conducted an AIS in the coastal area south of Waipouli Beach Park and on two spurs on the west, *makai*, side of Kūhiō Highway. Twenty seven trenches were excavated in the right-of way corridor and three sites were identified. SIHP # 50-30-08-2152 consists of four subsurface features, including a cultural deposit with charcoal dated to AD 1440-1480. SIHP # 50-30-08-2153 consists of three subsurface features, two fire pits, and a cultural layer. Charcoal from the base of one of the fire pits was dated to AD 1800-1890. SIHP # 50-30-08-2154 consists of a discrete charcoal lens with charcoal dating to AD 1730-1810. No artifacts were associated with these features, so the archaeologists suggested that they were associated with pre-Contact temporary habitation.

In advance of Phase II of the Waterline Project along the north-bound lane of Kūhiō Highway, SCS (Potter and Dega 2012b) conducted an assessment of the project area, including the excavation of four trenches. No cultural layers or features were found in these four trenches.

3.4 Background Summary

Traditionally, Waipouli Ahupua‘a was known for its fine surf area. The LCAs show several house lots at the beach, but there are also house lots within the plots claimed for *lo‘i* and *kula*

along the southern edge and within the marshy area more in the Kapa‘a direction. While most of the claims are for *lo‘i* and *kula*, one LCA (8836) also claimed a fishpond and some *wauke*. This general area is known as Hapakio or the *konohiki's* fishpond. Homes and *kula* were scattered around the pond where *lo‘i* would have been on the edges of the wetland and the flatlands were used for pasture and grasslands. The settlement in Waipouli, unlike adjoining *ahupua‘a*, is spread from the shoreline inland and those living inland at the time of the Māhele also had houses with their *lo‘i* and *kula*, even in the most *mauka* claim (8838). The Boundary Commission record adds locations of old home sites far inland as well locations of *koa* and *kukui* trees and places to catch wild fowl.

Little cultural history is known for North and South Olohena Ahupua‘a. According to LCAs, only one *kuleana* parcel was awarded (within the *makai* portion of North Olohena) to Pahuwai. Pahuwai lived and worked his *lo‘i* there.

The archaeological research of Waipouli, North Olohena, and South Olohena Ahupua‘a has been mostly aligned to development along the coast. These studies have revealed vast tracts of intact subsurface cultural layers and high concentrations of burials that suggest a long occupation spanning several centuries beginning approximately AD 1400–1500, with evidence of a range of activities, subsistence through *kalo lo‘i* cultivation and aquaculture, patterns of settlement, and indicators of social status. Additional extents of subsurface cultural layers as well as burials can be expected to be encountered during field survey in the vicinity.