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OCT 05 2012

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

REF:OCCL:TM

CDUA: HA-3626
Acceptance Date: May 18, 2012
180-Day Exp. Date: November 14, 2012

MEMORANDUM

TO: Gary L. Hooser, Director
Office of Environmental Quality Control

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

SEP 26 2012

RECEIVED '12 SEP 26 A11:

SUBJECT: Final Environmental Assessment (EA) for Conservation District Use Application (CDUA) HA-3626 for a Single Family Residence & Related Improvements Located at Maku`u, Puna, island of Hawai`i, TMK: (3) 1-5-010:032

The Office of Conservation and Coastal Lands (OCCL) has reviewed the Final Environmental Assessment for the subject use. The Draft Environmental Assessment (DEA) for this project was published in OEQC's June 8, 2012 Environmental Notice.

The final EA is being submitted to OEQC. We have determined that this project will not have significant environmental effects, and have therefore issued a FONSI. Be advised, however, that this finding does not constitute approval of the proposal. Please publish this notice in OEQC's upcoming October 8, 2012 Environmental Notice.

The siting of the residence in the Conservation District versus the Agricultural District continues to be an outstanding issue for the OCCL. The fact that land that lies within the Conservation District was subdivided without authorization from the Board of Land and Natural Resources is also an outstanding issue.

We have enclosed a hard copy and a disk with a pdf. file of the final EA and the OEQC Bulletin Publication Form and Project Summary. Comments on the Draft Environmental Assessment were sought from relevant agencies and the public, and were included in the final EA.

Please contact Tiger Mills of our Office at 587-0382 if you have any questions on this matter.

Attachments

OEQC Publication Form
The Environmental Notice

Name of Project:	Gapp Single-Family Residence in the Conservation District at Makuʻu
Applicable Law:	Chapter 343, HRS
Type of Document:	Final EA
Island:	Hawai`i
District:	Puna
TMK:	(3rd) 1-5-010:032
Permits Required:	County of Hawaiʻi: Special Management Area Permit or exemption; Department of Land and Natural Resources, CDUP; grading permit
Name of Applicant:	
Address	John and Maureen Gapp
City, State, Zip	PO Box 1128 Pahoa HI 96778
Contact and Phone	Sidney Fuke 808-969-1522
Approving Agency:	Office of Coastal and Conservation Lands Hawaiʻi State DLNR
Address	P.O. Box 621
City, State, Zip	Honolulu HI 96809
Contact and Phone	Sam Lemmo: 808-587-0377
Consultant	Geometrician Associates
Address	PO Box 396
City, State, Zip	Hilo HI 96721
Contact and Phone	Ron Terry 808-969-7090

Project Summary: John and Maureen Gapp (the applicants) seek a Conservation District Use Permit to build a single-family residence and related improvements on a 5.58-acre lot located adjacent to the shoreline at Makuʻu. The one-story home will be 4,552 square feet, including the house, garage, and saltwater pool. The home will be set back 200 feet from the shoreline at 25 feet above sea level. Other features include an Individual Wastewater System, a water well, a driveway, underground utilities, an at-grade covered lanai and open decks, various walkways, small fenced gardens, and landscaping using mostly native or Polynesian species between the home and the shoreline setback line. No modifications within the shoreline setback area are planned. Four burial sites and archaeological sites in the four-acre *mauka* portion of the lot will be preserved in accordance with already accepted preservation and burial treatment plans. Archaeological monitoring will occur during construction. Landclearing and construction would occur over roughly an acre, and produce minor short-term impacts to noise, air and water quality and scenery that would be mitigated by Best Management Practices. Impacts to the island wide-ranging endangered Hawaiian hoary bat and Hawaiian Hawk will be avoided through timing of vegetation removal and/or hawk nest survey.

***Proposed* Distribution List for Gapp Single-Family Residence in the Conservation District at Maku‘u Final EA**

Gary Hooser, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu HI 96813

Russell Y. Tsuji, Administrator
Hawai‘i State DLNR Land Division
P.O. Box 621
Honolulu, HI 96809
DLNR Land Division

Bobby Jean Leithead-Todd, Director
Hawai`i County Planning Dept.
101 Pauahi Street, Suite 3
Hilo HI 96720

Keaau Public Library
16-571 Keaau-Pahoa Road
Keaau HI 96749

Dear Participant:

Thank you for your participation in the Environmental Assessment (EA) process for the subject project. Attached for your records is the Final EA prepared pursuant to the EIS law (Hawai`i Revised Statutes, Chapter 343) and the EIS rules (Administrative Rules, Title 11, Chapter 200).

Project Name: Gapp Single-Family Residence in the Conservation District at Maku‘u

Location: Island: Hawai`i District: Puna
Tax Map Key Number: (3rd) 1-5-010:032

Approving: Agency:	**Hawai‘i State Department of Land and Natural Resources**	
Address:	**P.O. Box 621** **Honolulu HI 96809**	
Contact:	**Sam Lemmo**	**Phone: 587-0377**

If you no longer need the Draft or Final EA, please recycle it.

FINAL ENVIRONMENTAL ASSESSMENT

GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

October 2012

TMK (3rd): 1-5-010:032
Maku‘u, Puna, County of Hawai‘i, State of Hawai‘i

APPLICANTS:

John and Maureen Gapp
PO Box 1128
Pahoa HI 96778

APPROVING AGENCY:

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

CONSULTANT:

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

FINAL ENVIRONMENTAL ASSESSMENT
GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

TMK (3rd): 1-5-010:032
Maku‘u, Puna, County of Hawai‘i, State of Hawai‘i

APPLICANTS:

John and Maureen Gapp
PO Box 1128
Pahoa HI 96778

APPROVING AGENCY:

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

CONSULTANT:

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

CLASS OF ACTION:

Use of Land in Conservation District

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

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APPENDIX 3 Archaeological and Cultural Impact Assessment Reports
APPENDIX 4 Coastal Erosion Study

SUMMARY OF PROJECT, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

John and Maureen Gapp (the applicants) seek a Conservation District Use Permit (CDUP) to build a single-family residence and related improvements on a 5.58-acre lot located adjacent to the shoreline at Makuʻu in the Puna District. The residence is proposed for the Conservation District portion of the property because the dense concentration of archaeological sites in the Agricultural District portion does not afford an area of sufficient size for a residence. The proposed one-story home will be 4,552 square feet, including the house, garage, and saltwater pool ~~and cabana/pavilion~~. The home will be set back about 200 feet from the shoreline at an elevation of 25 feet above sea level. An open cabana/pavilion proposed in the Draft EA for a location 60 feet from the shoreline, to be used as a staging and storage area for throw nets, poles and tackle, and gardening equipment, has been removed from the project out of deference to DLNR concerns. Other features include an Individual Wastewater System, a water well, a 12,000-gallon water tank for fire flow, a driveway, underground utilities, an at-grade covered lanai and open decks, various walkways, small fenced gardens, and landscaping using mostly the native or Polynesian species found in the area in the area between the home and the shoreline setback line. No modifications within the shoreline setback area are planned. Four burial sites and archaeological sites in four-acre *mauka* portion of the lot within the State Land Use Agricultural District will be preserved in accordance with already accepted preservation and burial treatment plans.

Landclearing and construction activities would occur over roughly an acre, which would produce minor short-term impacts to noise, air and water quality and scenery. These would be mitigated by Best Management Practices that are expected to be required as conditions of the Conservation District Use Permit and grading permit. The applicants will ensure that their contractor performs all earthwork and grading in conformance with applicable laws, regulations and standards. The project has been fully surveyed for threatened and endangered plants and none are present. Impacts to the island wide-ranging endangered Hawaiian hoary bat and Hawaiian Hawk will be avoided through timing of vegetation removal and/or hawk nest survey. Archaeological and cultural resources have been avoided through inventory, consultation, and treatment plans, and the site layout has situated the structures and roadways in areas that avoid impacts. Completion of archaeological preservation actions will be required during a designated period of time associated with construction of the home. Archaeological monitoring will occur during construction, and in the unlikely event that additional undocumented archaeological resources, including shell, bones, midden deposits, lava tubes, or similar finds, are encountered during construction within the project site, work in the immediate area of the discovery will be halted and the State Historic Preservation Division will be contacted to determine the appropriate actions.

PART 1: PROJECT DESCRIPTION AND E.A. PROCESS

1.1 Project Description and Location

John and Maureen Gapp (the applicants) seek a Conservation District Use Permit (CDUP) to build a single-family residence and related improvements on a 5.58-acre lot at Makuʻu in the Puna District of the Big Island of Hawaiʻi (Figure 1a). The property is located between the shoreline and the unpaved Government Beach Road, flanked by similar shoreline lots (Figure 1b). The State Land Use District for the *makai* third of the densely vegetated property (Figure 2), and adjacent properties, is Conservation (Figure 3). *Mauka* of this coastal portion the property is within the State Land Use Agricultural District. The residence is proposed for the Conservation District portion of the property because the dense concentration of archaeological sites in the Agricultural District portion does not afford an area of sufficient size for a residence.

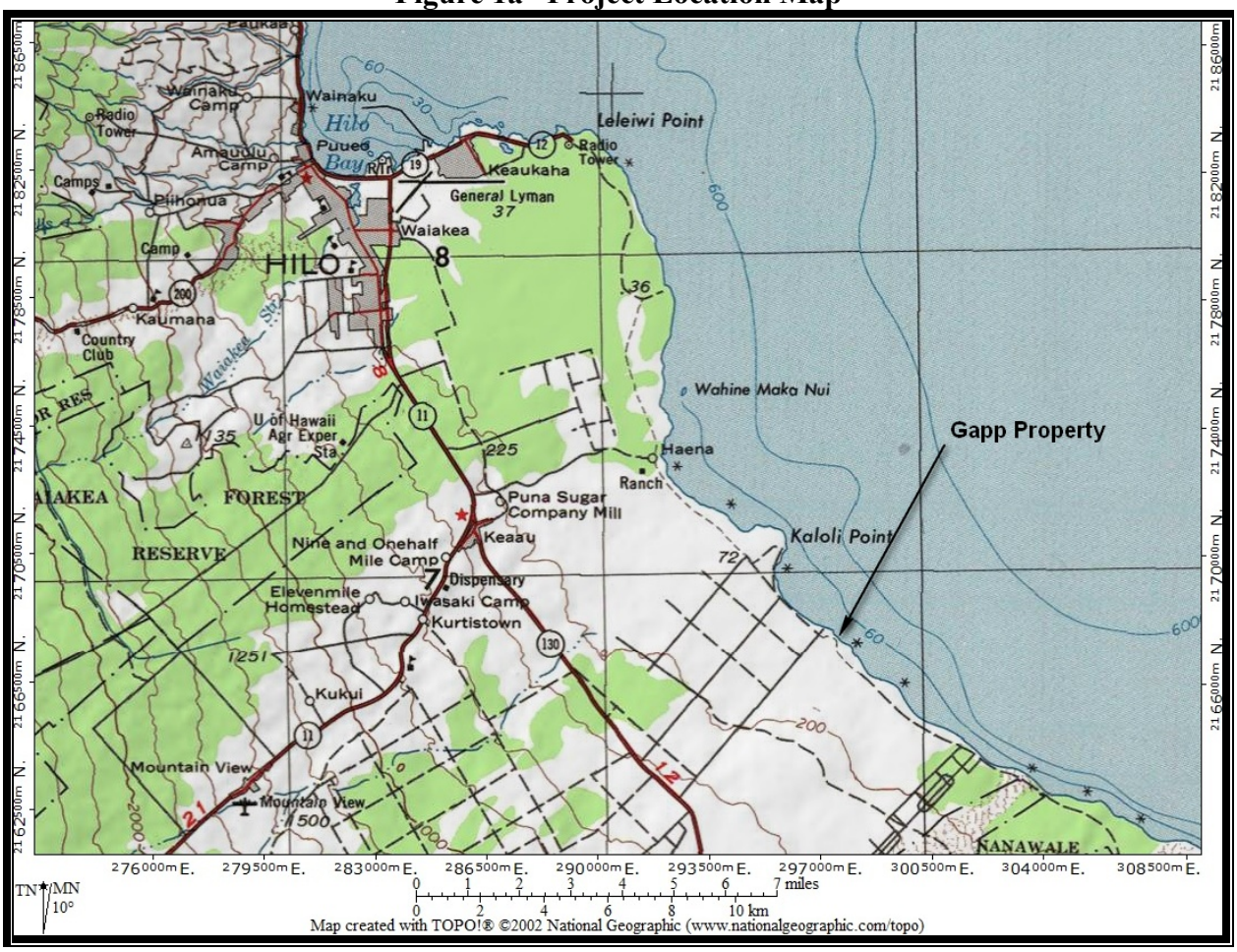
The proposed one-story home will be 4,552 square feet total, including the house, garage, saltwater pool ~~and cabana/pavilion~~ (Figure 3). The general feel and location of the home is meant to recall a home that Mr. Gapp built in Kalapana Gardens and subsequently lost to the eruption of Kilauea Volcano in 1990. The house will have three bedrooms and two ~~three~~ baths, and will be set back about 200 feet from the shoreline at an elevation of about 25 feet above sea level, with low walls serving to separate the house pad area from the stepped-down, lower elevation areas *makai*, mark the edge of the low dropoff for safety reasons and providing a decorative element to the yard. An open cabana/pavilion proposed in the Draft EA for a location 60 feet from the shoreline, to be used as a staging and storage area for throw nets, poles and tackle, and gardening equipment, has been removed from the project out of deference to DLNR concerns. A water well that will require a permit from the Commission on Water Resources Management, a 12,000-gallon water tank for fire flow and an Individual Wastewater System in compliance with State Department of Health regulations will be built. Electricity and telephone poles and lines are present on Government Beach Road, and these services would be extended through underground conduits along the driveway to service the home. Other features include a driveway, an at-grade covered lanai and open decks, various walkways, small fenced gardens, and landscaping using mostly the native or Polynesian species found in the area in the area between the home and the shoreline setback line (Figure 3). Albizia trees, fast-growing non-natives that pose a hazard to structures on and adjacent to the property, will be selectively removed. No modifications within the shoreline setback area are planned. Four burial sites and archaeological sites in four-acre *mauka* portion of the lot within the State Land Use Agricultural District will be preserved in accordance with already accepted preservation and burial treatment plans.

1.2 Environmental Assessment Process

This Environmental Assessment (EA) process is being conducted in accordance with Chapter 343 of the Hawaiʻi Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawaiʻi Administrative Rules (HAR), is the basis for the environmental impact assessment process in the State of Hawaiʻi. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the anticipated finding that no significant impacts are expected to occur, based on the preliminary findings for

each criterion made by the consultant in consultation with the Hawai‘i State Department of Land and Natural Resources, the approving agency. If, after considering comments to the Draft EA, DLNR concludes that, as anticipated, no significant impacts would be expected to occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to proceed. If the agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) will be prepared.

Figure 1a Project Location Map



1.3 Public Involvement and Agency Coordination

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

<u>County</u>:

Planning Department	County Council	Fire Department
Department of Public Works	Police Department	

State:

Department of Hawaiian Home Lands Department of Health
Department of Land and Natural Resource (DLNR)
Office of Hawaiian Affairs

Private:

Sierra Club Malama O Puna
Adjacent Property Owners Nicole Lui

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

Figure 1b TMK Map

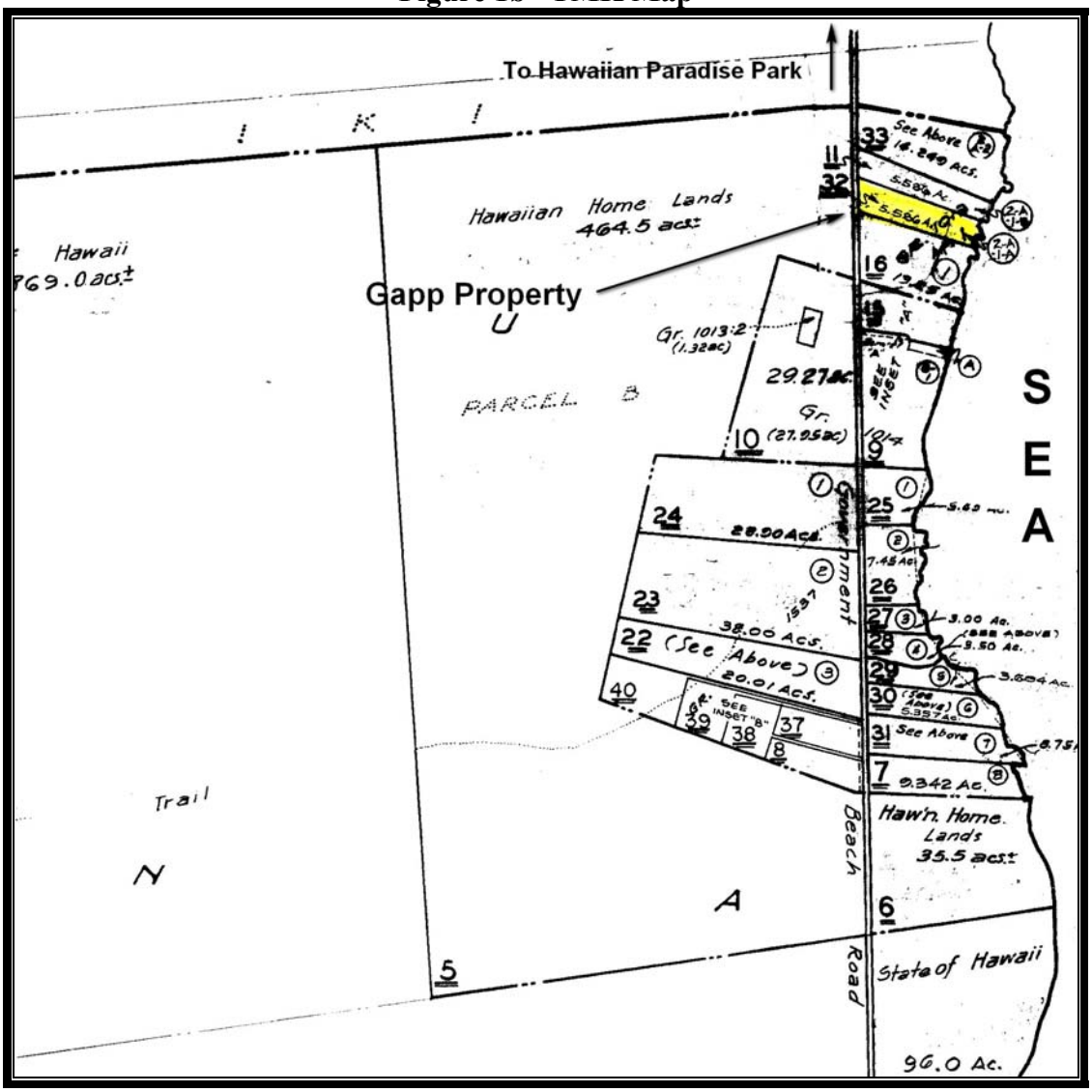


Figure 2 Project Site Photos

Typical Vegetation on Project Site ▲ ▼ Shoreline in Front of Project Site

Proposed Residence, pool, and landscaping for John and Maureen Gapp, using and highlighting existing agriculture, topography and preservation areas.

Page 1: House floor plan

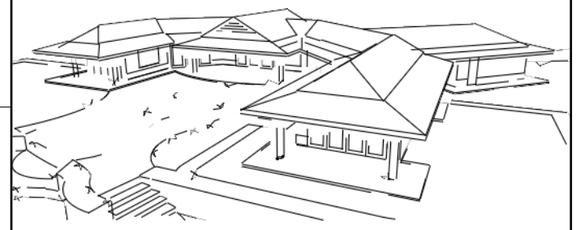
Page 2: landscaping plan and site plan

Page 3: House elevations

NEW RESIDENCE FOR:

John & Maureen Gapp

TMK # 3-1-5-010-032



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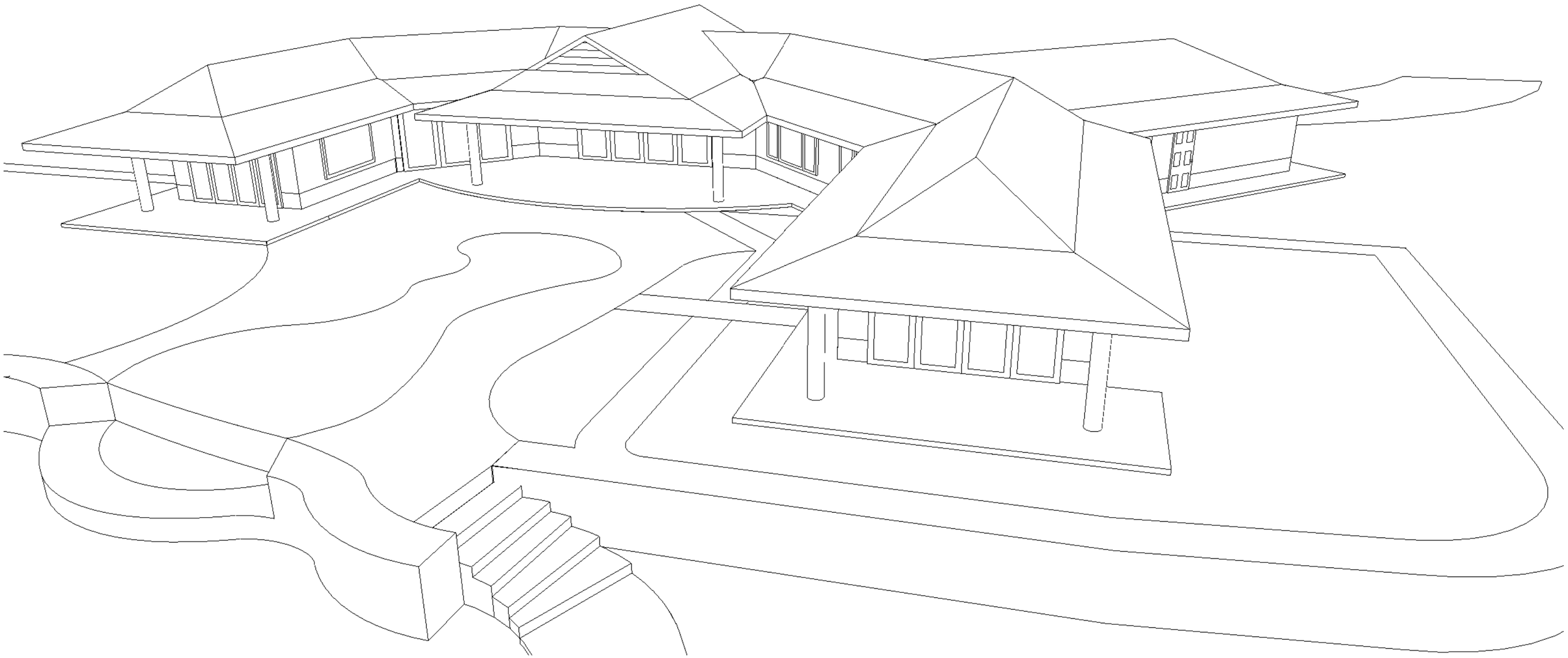
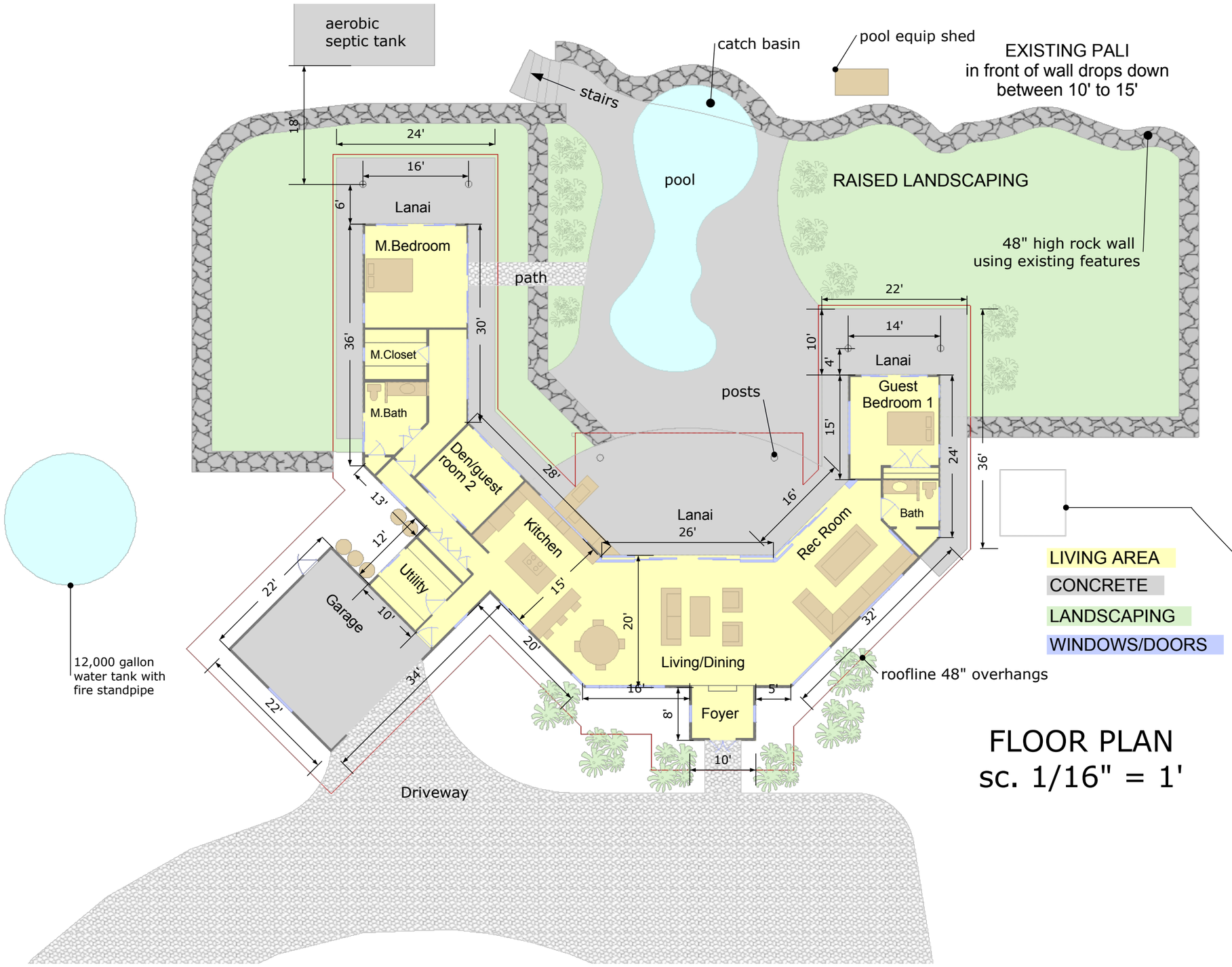
mattpurvis@gmail.com



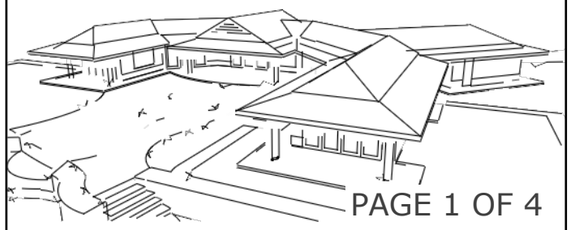


FLOOR PLAN
sc. 1/16" = 1'

NEW RESIDENCE FOR:

John & Maureen Gapp

TMK # 3-1-5-010-032



PAGE 1 OF 4

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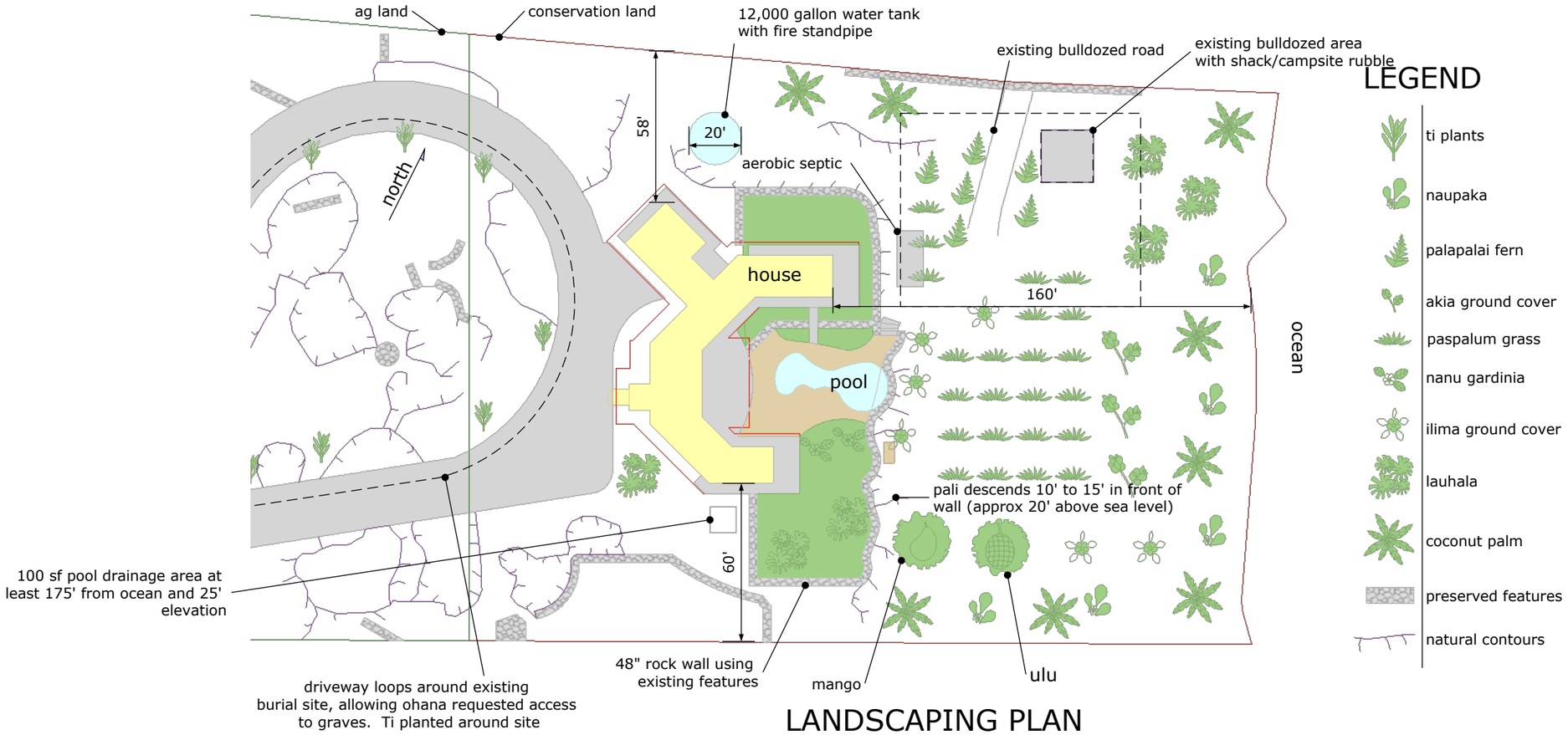
AREA CALCULATIONS:	
LIVING AREA	2630 sf
GARAGE	484 sf
LANAI	827 sf
CABANA	448 sf
POOL & CATCH BASIN	467 sf
POOL EQUIP	32 sf

TOTAL	4888 sf

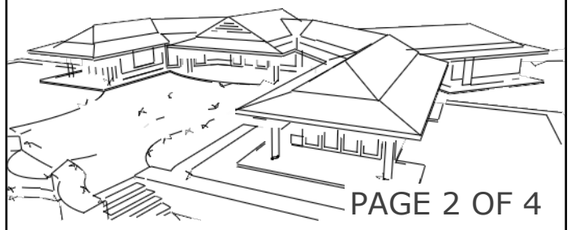


LANDSCAPING PLAN
sc. 1"=50'

LEGEND

- ti plants
- naupaka
- palapalai fern
- akia ground cover
- paspalum grass
- nanu gardinia
- ilima ground cover
- lauhala
- coconut palm
- preserved features
- natural contours

NEW RESIDENCE FOR:
John & Maureen Gapp
TMK # 3-1-5-010-032



PAGE 2 OF 4

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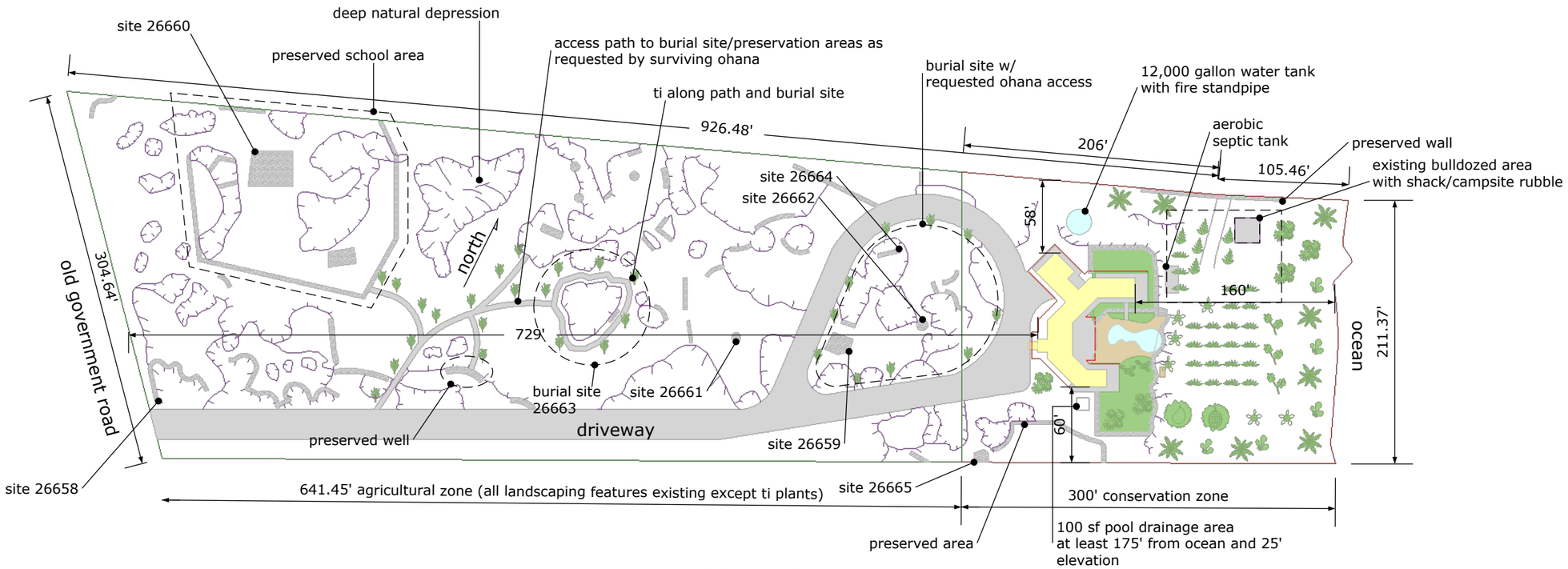
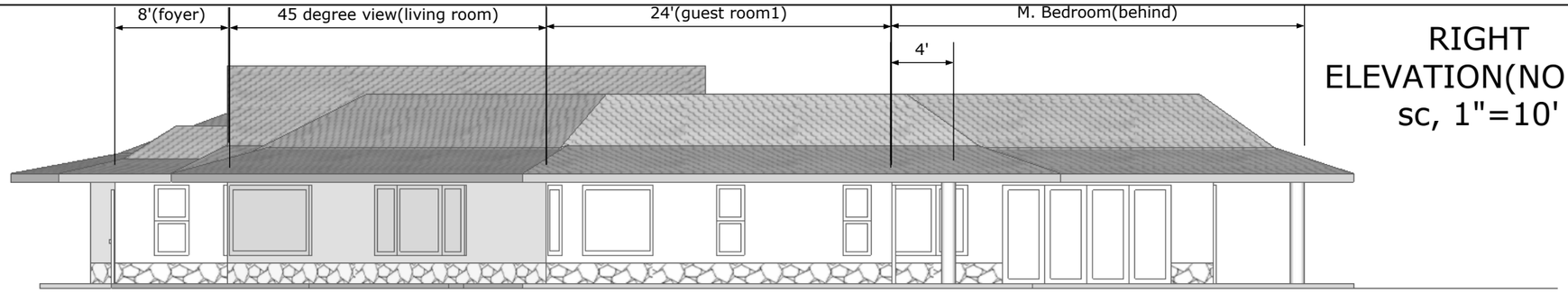
mattpurvis@gmail.com

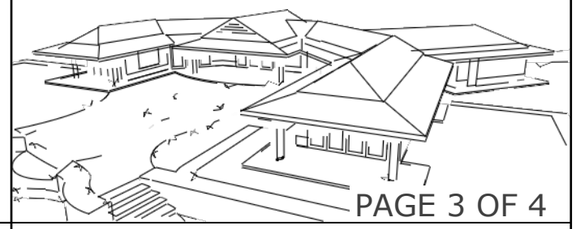


SITE PLAN
sc, 1"=100'



RIGHT
ELEVATION(NORTH)
sc, 1"=10'

NEW RESIDENCE FOR:
John & Maureen Gapp
TMK # 3-1-5-010-032



Drawn by: Matt Purvis
808-960-4555
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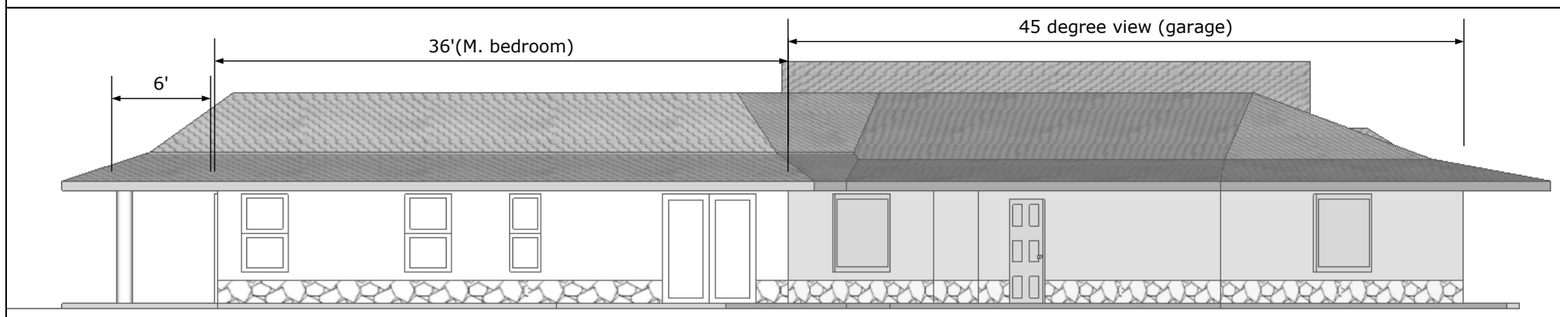
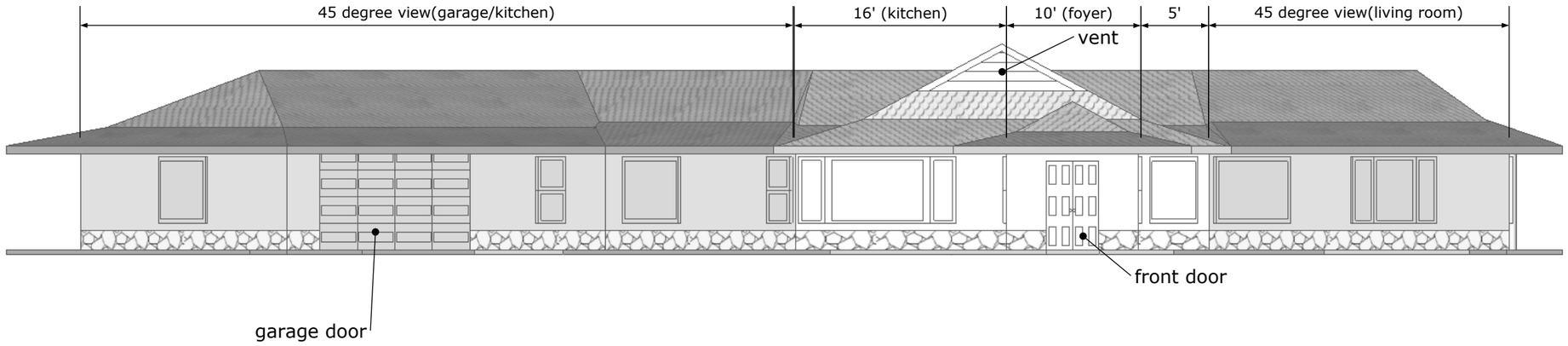
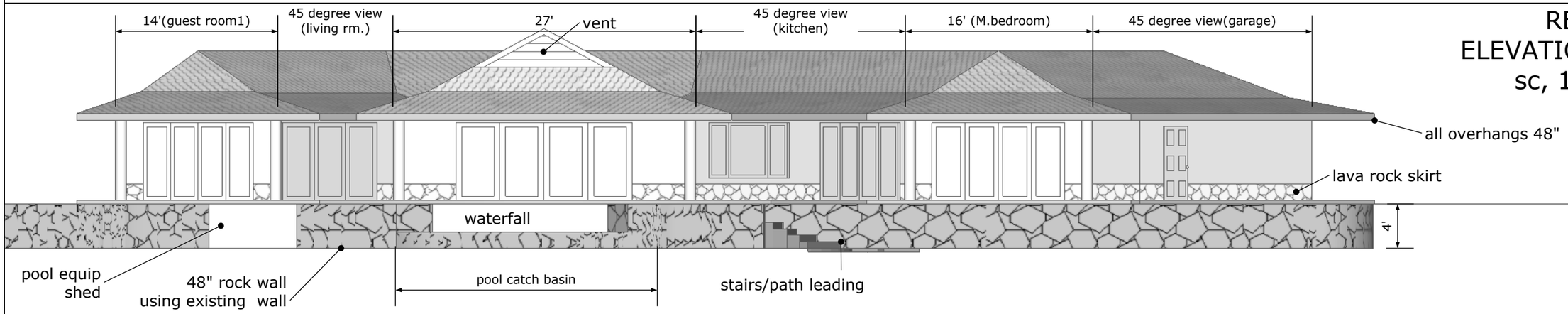


LEFT
ELEVATION(SOUTH)
sc, 1"=10'



FRONT
ELEVATION(MAUKA)
sc. 1"=10'



REAR
ELEVATION(MAKAI)
sc, 1"=10'

PART 2: ALTERNATIVES

2.1 Proposed Project

The proposed project and its location are described in Section 1.1 above and illustrated in Figures 1-3. The location of the home site, 200 feet from the shoreline, was chosen in order to enjoy coastal breezes and views while avoiding the actual shoreline area along with archaeological sites, especially the burials in the middle of the long-narrow property. As discussed in Section 3.2.2, the Gapps have proactively coordinated with a lineal descendant, who endorsed the decision to locate the home away from the burials closer to the shoreline, so that lineal descendants' visits to the burial area are facilitated and do not require any disturbance of the residents. The proposed home location is thus the most reasonable and culturally and environmentally sensible location on the property.

2.2 No Action

Under the No Action Alternative, the residence would not be built. The lot, which was part of a larger property ~~legally~~ subdivided with approval from the County of Hawai'i in 1999 into two lots for eventual residences, would remain unused. Persistent unauthorized marijuana cultivation, illegal camping and trash dumping, including potentially toxic materials and bulky items, could become a problem, as it has in some other vacant land in this area. Inappropriate entry into burial features and other sites important to Hawaiian culture could also occur. This EA considers the No Action Alternative as the baseline by which to compare environmental effects from the project. No other alternative uses for the property are currently desired by the applicants, and thus none are addressed in this EA.

2.3 Alternative Designs/Locations Proposed by DLNR-OCCL

In their letter concerning the CDUA and Draft EA, the Department of Land and Natural Resources, Office of Conservation and Coastal Lands (DLNR-OCCL), expressed concern with the detached cabana/ pavilion, questioning whether it met with CDUA rules concerning single-family homes, which require all structures to be connected (or best alternative). The applicants believe that the simple, open pavilion to be used as a staging and storage area for gardening and recreational fishing by the owners, including throw nets, poles and tackle would not be as appropriately located adjacent to the home. DLNR-OCCL has often expressed concerns about utilizing detached structures as vacation rentals. The applicants have stated that it will not be lived in or rented. It was never designed to have a kitchen but was to have had a deep sink for cleaning fish; the Gapps are willing to delete the sink. Considering the proposed function of the home, the detached pavilion is the best alternate to an all-connected design. However, in deference to DLNR concerns, the cabana/pavilion has been removed.

DLNR OCCL also questioned whether a location in the State Land Use Agricultural District portion of the property would be more appropriate. However, that portion of the property contains a number of burial sites and a significant and unique archaeological site (the 19th century school remnants) that require preservation with buffers. The Gapps originally planned the home at a site within the Agricultural District and even obtained a Special Management Area permit. As the applicants began site preparation in 2007, they noted archaeological sites and immediately ceased work and consulted DLNR-OCCL, who instructed them to conduct an archaeological inventory survey, for which they contracted a professional archaeologist. The Gapps have diligently prepared all plans recommended by the archaeologist, including preservation plans and a burial treatment plan (during which they worked with the lineal descendants), which have been fully accepted, as discussed in Section 3.2.2. The original planned building site turned out to have the largest of the two grave sites. The area between the school site and the grave sites contains numerous old walls and agricultural pens and has many deep fissures. It is not feasible to build between the school

site and the first burial site as this area is a large fissure. The school site provides a valuable resource for the local schools to visit and explore, which the applicants wish to make available in an undisturbed context. The identified lineal descendant for the property, Nicole Lui, visited the site and requested that the Gapps make the grave sites more accessible for their visits, as documented in Section 3.2.2. Accordingly, the driveway was designed to pass around one site, as proposed in the burial preservation plan, making both sites accessible to the family. Only the proposed location in the Conservation District, on the site of a former residence, satisfies archaeological and cultural concerns.

The reader is referred to Appendix 1b for the DLNR-OCCL letter and the detailed response. Upon receiving the response, DLNR-OCCL expressed doubt that there was insufficient space in the Agricultural District portion of the property to accommodate the house while avoiding impacts to historic sites and burials.

Accordingly, Dr. Robert Rechtman, the cultural resource specialist who prepared the Archaeological Inventory Survey and Cultural Impact Assessment for the Environmental Assessment, was asked to comment on the suggestion by OCCL to move the proposed home to the Agricultural District. Dr. Rechtman's letter is contained at the end of Appendix 1b. He notes in the letter that :

> "…there are three large Archaeological/Burial preservation areas containing five sites (SIHP Sites 26659, 26660, 26662, 26663, and 26664) within the Agricultural District portion of the parcel. A small portion of one of these preservation areas extends into the Conservation District portion of the parcel where there is one additional preservation area containing one site (SIHP Site 26665).
>
> The current proposed location of the house is shoreward of all of the preservation areas, which form a "zone of preservation" occupying roughly the mauka 3/4 of the parcel. The current proposed location of the residence was taken into consideration when assessing cultural impacts, and while I did not prepare the Archaeological Preservation Plan or the Burial Treatment Plan, I would assume that the current proposed location was also a consideration during those planning processes. If the proposed residence is to be relocated, then a reassessment of impacts and a reconsideration of preservation buffer sizes will have to be conducted. The current location "beyond" the zone of preservation sites does not present an intrusive visual presence, which might not be the case if the residence was to be placed "within" the zone of preservation sites. As can be seen on the attached figure, and keeping the same configuration, the proposed residence will fit between preservation areas, but given the drastic "up and down" nature of the lava substrate in this area, substantial alteration of the natural terrain and vegetation (grubbing and grading) will have to occur, which will clearly impact the existing natural feel of the zone of the preservation sites.

I am not sure what justification OCCL offered for the suggested relocation, but in my professional opinion, given the archaeological/cultural resources present on the parcel, the most strategic in terms of historic preservation and the most culturally sensitive location for a single family residence on the parcel is in the area shoreward of the zone of preservation sites."

It is also important to note that the Conservation District area previously contained a small house for an unknown number of decades and then as a campsite on and off for at least 10 years, as the site is near a tidepool area popular with picnickers and fishermen. After the applicants purchased the property they were obliged to haul away many tons of garbage and wreckage from the old house site (see Figure 3 for area). The relatively pristine part of the property is actually within the Agricultural District.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION

The long, narrow 5.58-acre property is located between the shoreline and the unpaved Government Beach Road and is flanked by similar shoreline lots. It is presently vacant and unused and is covered with dense, primarily non-native vegetation except near the shoreline (see Figure 2). At its highest point it is approximately 30 feet above mean sea level.

3.1 Physical Environment

3.1.1 Geology, Soils and Geologic Hazards

Environmental Setting

The property is located on the flank of Kilauea, an active volcano, in the District of Puna, in the *ahupua'a* of Maku'u, on lava flows dated at between 300 and 750 years ago (Wolfe and Morris 1996). Soil in the area is predominately pahoehoe lava flow (rLW) and Opihikao extremely rocky muck (rOPE) (U.S. Soil Conservation Service 1973). Both are highly drained and their soil subclass is VIIIs, which means they have limitations that because of their stony nature preclude their use for commercial crops and restrict their use to recreation, wildlife, or water supply, or to aesthetic purposes. This area receives an average of about 120 inches of rain annually, with a mean annual temperature of approximately 75 degrees Fahrenheit (UH Hilo-Geography 1998:57).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey in this area of Puna is Zone 3 on a scale of ascending risk 9 to 1 (Heliker 1990:23). The relatively high hazard risk is because Kilauea is an active volcano. In Zone 3, approximately 1-5 percent of the land area has been covered by lava flows since 1800, but more than 75 percent has been covered in the last 750 years. As such, there is modest risk of lava inundation over short time scales on the subject property.

In terms of seismic risk, the entire Island of Hawai'i is rated Zone 4 Seismic Hazard (*Uniform Building Code, 1997 Edition*, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built. The project site does not appear to be subject to subsidence, landslides or other forms of mass wasting.

Impacts and Mitigation Measures

In general, geologic conditions impose no constraints on the proposed action, as much of Hawai'i Island faces similar volcanic and seismic hazard. The applicants understand the risk and the residence is not imprudent to construct.

3.1.2 Flood Zones and Shoreline Setting

Environmental Setting

Floodplain status for many areas of the island of Hawai‘i has been determined by the Federal Emergency Management Agency (FEMA), which produces the National Flood Insurance Program’s Flood Insurance Rate Maps (FIRM). The map for the project area is 1551661150C, has not been printed. The home building site is classified in Flood Zone X, areas outside the mapped 500-year floodplain, with minimal tsunami inundation.

Impacts and Mitigation Measures

Property near the shoreline is subject to natural coastal processes including erosion and accretion, which can be affected by human actions such as removal of sand or shoreline hardening. Erosion may adversely affect not only a lot owner’s improvements but also State land and waters, along with the recreational and ecosystem values they support. Development of shoreline properties also exposes residents and visitors to increased risk of hazardous high waves and tsunami.

In the case of this property, the project does not involve any shoreline hardening or use of areas subject to beach processes. Access to the home will be by a driveway from the Government Beach Road at the back of the property. As discussed above, the proposed home would be outside the Flood Zone, at a distance of about 200 feet from the shoreline. ~~The cabana/pavilion will be placed at least 60 feet from the shoreline after it is certified (the applicants propose to contract for and provide a shoreline survey for certification after the proposed home and cabana are approved and then locate them appropriately on the final Site Plan that will be provided to DLNR prior to construction).~~

The amendments to Title 13, Chapter 5, Hawai‘i Administrative Rules (Conservation District), adopted at the BLNR meeting of August 12, 2011, specify new procedures for determining the shoreline setback. Exhibit 4 of the rules state:

> “The shoreline setback line shall be established based on a setback distance from the certified shoreline of 40 feet plus 70 times the average annual coastal erosion rate, based on a coastal erosion study as defined in this chapter. No shoreline setback shall be established for any lot subject to this chapter unless the application for a shoreline setback line includes a shoreline survey certified by the department not more than 12 months prior to submission of the permit application. The shoreline setback line shall be based on the average lot depth (ALD) measured from the current shoreline. For lots with an ALD of two hundred feet or less, the shoreline setback line shall be established based on the ALD of the lot, as provided in Table 1, or based on 40 feet plus 70 times the annual erosion rate. The applicant may choose the lesser of the two methods, but in no case shall the shoreline setback line be calculated to be less than 40 feet. The department may waive the requirement for coastal erosion study based on supportive documentation from the applicant. Such documentation may include, but is not limited to, county or state approved coastal erosion rate data provided through the University of Hawaii, School of Ocean, Earth Science, and Technology, or evidence that the erosion rate is zero.”

A coastal erosion analysis performed for the property by John P. Lockwood, Ph.D., is attached as Appendix 4 and summarized below. The property was inspected on February 26, 2012, when the tide level was +0.1 feet and there were moderate northeast waves and swells.

Because of the relatively young age of the lava flows here, the undisturbed surfaces are marked by surface textures and basaltic glass that serve as good markers for determination of erosion effects. These flows are dense and relatively non-vesicular, and thus are resistant to mechanical erosion. The flows are near horizontal in this area – dipping toward the sea at only about 1-2 degrees, and forming a coastal platform that is partially inundated by highest tides. Because of land subsidence, sea level rise and the fact that the lava flows were relatively thin where they entered the sea, no significant sea cliff has developed along the coast fronting the property. Ocean-facing cliffs were only 1-2 feet above sea level when inspected, and incoming waves flowed gently over pahoehoe surfaces as the tide rose, causing no erosion by normal wave activity.

A 10-12 foot high berm of storm-carried boulders located 75-150 feet inland from the coastal cliff face forms a barrier to storm wave activity, and coincides with the lowest level of coastal vegetation (*hala*, *naupaka*, and coconut palms). Individual boulders thrown inland by storm waves or tsunamis were found up to 50 feet onshore from the vegetation line, but are covered by dense vegetation and are not recent in origin. The degree of rounding of these boulders in the coastal berm indicates that most have been in place for a long time, as they are rounded by wave action, and are not derived by recent erosion of the coastline. Angular boulders (indicative of recent erosion by wave action) constituted only about 3 percent of all boulders.

At the coastal front of the property significant changes in shoreline position (as defined by Boak and Turner (2005) and Hwang, 2005) have been caused primarily by land subsidence and global sea level rise rates, and not by erosion. Inspection of aerial photographs dating back to 1954 revealed no discernible changes in the positions of the sea cliff nor of the vegetation-defined shoreline, but the large photo scales and variable tide positions between photograph pairs could obscure small changes. Determination of global secular sea level rise is complex and highly variable, owing to local and temporal variations, but is estimated at 1 mm/yr over the long term (Fletcher et al 2010 – Chapter 9). Land subsidence in East Hawai‘i was estimated at 4.8 mm/yr by Moore (1970), although it is much greater (8-17 mm/yr) 12 miles to the east in the Kapoho area (Hwang 2007). Additionally, catastrophic, sudden tectonic events can cause great local subsidence (Lipman et al 1985) in specific areas. In their description of the hazards facing this area, Fletcher et al (2002) state that the land in this area “sank and was inundated by a locally generated tsunami after a 4.1 earthquake rocked the southeast portion of the island [in 1868].

The fact that Hawaiian petroglyphs and lava flow surface structures and glass survive on the intertidal pahoehoe platform attests to the fact that surface erosion of the pahoehoe is negligible, although marine algae covering some petroglyphs (Figure 4) demonstrate that land subsidence relative to sea level is occurring. Minor lateral erosion does take place by hydraulic ramming of storm waves into sub-horizontal interflow contacts, and have the power to lift massive subangular boulders onto the coastal intertidal platform, but the rarity of such blocks inshore shows this is an infrequent event. In one area fronting the property, angular surfaces on one flow remnant showed that mechanical erosion had occurred at the base

of the coastal boulder berm, but the presence of petroglyphs within three feet of this broken area defined the maximum extent of any erosion as less than three feet in the period since the petroglyphs were made. All petroglyphs observed consist of European-influenced alphabetic characters, of probable mid-nineteenth century age.

As indicated above, the impact of mechanical erosion on the coastal shoreline at the property is negligible, involving occasional mechanical dislocation of lava blocks from coastal sea cliffs during major storm events, without quantifiable effect on shorelines. The combined effect of land subsidence and global sea level rise (likely about 5mm/yr at this site) could, however, substantially impact shoreline positions on these near-horizontal lava flows were it not for the presence of the coastal boulder berm. The position of this berm and the vegetation growing at its crest appear to be form a stable barrier to lateral transgression of rising seas – at least over the short term, or until major tectonic events like 1868 or future major tsunami waves impact the coastal berm.

Stereographic inspection of aerial photographs taken in 1954, 1965, and 1977 and comparison with recent Google Earth views revealed no changes in the position of rocky shorelines, of the coastal boulder berm, nor of the vegetation line during this 58 year period. Scale limitations of the aerial photographs inspected make identification of individual ocean-facing rock outcrops impossible, but it is probable that some individual rocks have been broken from the wave impact zone during this time period, but no measurable overall erosion has taken place.

According to the formula presented in Exhibit 4, the average lot depth for the Gapp property is roughly 1,000 feet. Using the procedures above, and utilizing the maximum setback for a lot with 200 feet or greater average depth, the shoreline setback would be 90 feet. The home has been set back 200 feet from the approximate location of the shoreline, a buffer of an additional 110 feet. ~~The fishing cabana, which depends upon a coastal location for its utility, will be 60 feet from the shoreline, when it is certified.~~

> A scenario of modest sea level rise would likely not substantially affect the integrity or use of the proposed residence (which would be located about 15 feet above sea level) for many decades, if at all. Somewhat larger increases, particularly in a case of sudden onset, could perhaps eventually affect it. If so, this residence would be among thousands, or perhaps tens of thousands, to be affected in what would be the largest disaster to affect the Hawaiian Islands since human settlement. As sea level rise is gradual, there would probably be an opportunity for the owner to consider relocating or scrapping the structure for re-use of its valuable materials should sea level rise sufficiently to endanger the structure. The owner would agree to a CDUP and/or deed condition that would prevent any future request for shoreline hardening to protect the residence, regardless of hardship, and a condition requiring moving or dismantling the home if sea level rise eventually threatens the integrity of the structure.

3.1.3 Water Quality

The property is adjacent to the sea but the house would be set back 200 feet from the shoreline and no grading activities would occur *makai* of this area (~~the cabana/pavilion would not require grading).~~ No water features such as streams, springs, or anchialine ponds are found on or near the property.

The saltwater pool will need occasional partial or full draining as part of maintenance, which will be accommodated, in accordance with all regulations, in a landscaped area near the home (see Figure 3), with all surface water kept on the lot, preventing any effects to water quality or neighboring property (see letter from Atlas Engineering at end of Appendix 1b). No other aspect of pool maintenance will have any environmental effects.

Land clearing and construction activities would occur on about an acre, including the driveway. After actual grading plans are developed, the applicant and engineer will determine whether the area of disturbance is sufficiently large to require a National Pollutant Discharge Elimination System permit. Grading for the driveway and house lot will include practices to minimize the potential for sedimentation, erosion and pollution of coastal waters. The applicants will ensure that their contractor shall perform all earthwork and grading in conformance with:

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

In addition, as part of construction, the applicants will require that the construction contractor implement the following practices:

- The total amount of land disturbance will be minimized. The construction contractor will be limited to the delineated construction work areas within the lot.
- The contractor will not allow any sediment to leave the site, particularly towards the ocean.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff.
- Cleared areas will be replanted or otherwise stabilized as soon as possible.

Upon its completion, the home will be similar to dozens of homes on shoreline lots in the area and is not expected to contribute to sedimentation, erosion, and pollution of coastal waters.

3.1.4 Flora and Fauna

Environmental Setting: Flora

Prior to human settlement of Hawai‘i, the natural vegetation of this part of this part of Puna shoreline was mostly coastal forest and strand vegetation, dominated by *naupaka* (*Scaevola taccada*), *hala* (*Pandanus tectorius*), *‘ōhi‘a* (*Metrosideros polymorpha*), *nanea* (*Vigna marina*) and various sedges and coastal herbs (Gagne and Cuddihy 1990). The site was systematically inspected for plants on several occasions, first by biologist Julie Leialoha and later by botanist Layne Yoshida. Both reports are included as Appendix 2. Special attention was paid in these surveys and subsequent field visits by the author of this EA to the presence of endangered species, particularly *Ischaemum byrone,* a State and federally listed endangered grass known to grow in the general area.

The Conservation District zone of the property was intensively surveyed on February 19, 2007, by Ms. Leialoha, who found that the overall dominant native species was *hala*. Coconut trees and scattered patches of *naupaka* make up the dominant species closest to the ocean. Though she had encountered the endemic species *Ischaemum byrone* in various parts of the Puna coastline, none were found on the property during the survey. Mr. Yoshida surveyed the entire property on August 21, 2009. He found that it could be divided into four vegetative communities. The largest is the Rose Apple Forest (*Syzigium jambos*), which occupies the *mauka* two-thirds of the property. The second community is the Hala Forest, which occupies most of the remainder of the lot except the shoreline area, which contains a third type consisting of weedy areas and a Coconut Forest. A miscellaneous fourth type has been mechanically cleared in the recent past and exhibits various early successional weeds.

The canopy in the Rose Apple Forest is uniformly 15 to 25 feet tall with 90 percent cover. In addition to rose apple, which occupies about 75 percent of the canopy, other trees including mango (*Mangifera indica*) and cecropia (*Cecropia obtusifolia*) are present. The rose apple trees have been greatly affected by a fungal pathogen that was recently introduced into Hawai‘i accidentally. This pathogen has damaged most of the young shoots and as a consequence the trees are denuded and unsightly (Figure 2). Furthermore, the understory is not as shaded as it would be if the trees had healthy foliage and is being rapidly invaded by weeds such as strawberry guava (*Psidium cattleianum*), yellow guava (*Psidium guajava*) and melastoma (*Melastoma* sp.). The most noticeable feature of the herb layer in this community are patches of *‘awapuhi* (*Zingiber zerumbet*), a Polynesian introduction. Shade tolerant species such as basket grass (*Oplismenus* sp.), thimbleberry (*Rubus rosifolius*) and *maile*-scented fern (*Phymatosorus grossus*) are also found throughout this community.

The Hala Forest in this area is second-growth but typical of the natural vegetation. Because of the dense layer of *hala* leaves on the ground there are few plants in the understory, even *hala* seedlings. The *hala* grove is so small that without maintenance it will likely be degraded and eventually overrun by aggressive non-native species already growing along the edge of the grove, such as California grass (*Brachiaria mutica*), *maile pilau* (*Paederia foetida*), melochia (*Melochia umbellata*), and moonflower (*Ipomoea alba*).

Of relevance in the remaining zones is the shoreline-bordering coconut, which provides scenic interest, useful nuts, and leaves from scattered *hala* trees, and is a reminder of the traditional use of the area. Areas

of the property without a dense forest cover were being overrun by a wide variety of herbaceous weeds during the 2007 and 2009 surveys. Such areas also had many seedlings (which are now saplings or trees) of the rapidly growing gunpowder tree (*Trema orientalis*). The herbaceous weeds are rapidly being replaced by non-native shrubs and trees.

No rare, threatened or endangered species were found in any part of the property. Lists of the species detected on the property itself are found in Appendix 2.

Environmental Setting: Fauna

Typical expected birds, some of which were observed during site visits, include Common Myna (*Acridotheres tristis*), Northern Cardinal (*Cardinalis cardinalis*), Spotted Dove (*Streptopelia chinensis*), Japanese White-eye (*Zosterops japonicus*), and House Finch (*Carpodacus mexicanus*). No native birds were identified during site visits, and it is unlikely that many native forest birds would be expected to use the project site due to its low elevation, alien vegetation and lack of adequate forest resources. Common shorebirds, such as Golden Plover (*Pluvialis fulva*), Ruddy Turnstone (*Arenaria interpres*), and Wandering Tattler (*Heteroscelus incanus*), can be observed on the basalt shelf fronting the property, feeding on shoreline resources. They would be unlikely to make much use of the property itself, which is densely vegetated and offers no habitat for them.

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

Other mammals in the project area are all introduced species, including feral cats (*Felis catus*), feral pigs (*Sus scrofa*), small Indian mongooses (*Herpestes a. auropunctatus*) and various species of rats (*Rattus* spp.). None are of conservation concern and all are deleterious to native flora and fauna.

The coastal and marine fauna and flora are typical of the high-energy coasts of Puna, which are young ecosystems with limited coral growth but a variety of algae, fish and invertebrates. Marine mammals and reptiles, some of them endangered, also visit the Puna coastal waters.

Impacts and Mitigation Measures

Because of the minor nature of the project and the lack of sensitive terrestrial ecosystems and threatened or endangered plant species, construction and use of the single-family residence are not likely to cause adverse biological impacts. The applicants are planning minimal landscaping utilizing mainly the native and Polynesian species found in the area, as shown in Figure 3. To make the property, most of which is covered densely with non-native vegetation, a more hospitable place to live, the Gapps wish to remove the invasive plants in the conservation area. They would be replaced with native, Polynesian and 19th century period trees, with a focus on plants that provide a sustainable resource like mango, *ulu*, and bananas. They will also preserve most of the existing *hala*, coconuts and *naupaka*. Removing the dense invasive

plants will leave the area open to sea breezes and light, which will decrease the heavy mosquito population. Although the area planned for the home contains *hala* (most of which has sprouted since bulldozing in the 1970s and more recently), *hala* that will not be disturbed is also abundant in the Coconut Forest in the 40-foot setback area. The location of the house also avoids disruption of the shoreline coconut grove. The precautions for preventing effects to water quality during construction listed above in Sections 3.1.1 and 3.1.6 will reduce adverse impact on aquatic biological resources in coastal waters to negligible levels.

In order to avoid impacts to the endangered but regionally widespread terrestrial vertebrates listed above, the applicants have committed to conditions that are proposed for the CDUP. Specifically, construction will commit to refrain from activities that disturb or remove the vegetation between May 15 and August 15, when Hawaiian hoary bats may be sensitive to disturbance. If landclearing occurs between the months of March and September, inclusive, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian Hawks are present, no land clearing will be allowed until October, when hawk nestlings will have fledged. Finally, the applicants agree to shield any exterior lighting from shining upward, in conformance with Hawai‘i County Code § 14 – 50 et seq., to minimize the potential for disorientation of seabirds.

3.1.4 Air Quality, Noise, and Scenic Resources

Environmental Setting

Air quality in the area is generally excellent, due to its rural nature and minimal degree of human activity, although vog, sulfur dioxide and particulate matter from Kilauea volcano is occasionally blown into this part of Puna. Noise on the site is low, and is derived from natural sources (such as surf and wind) due to the very rural nature of the area.

The area shares the quality of scenic beauty along with most of the Puna coastline. The County of Hawai‘i General Plan contains Goals, Policies and Standards intended to preserve areas of natural beauty and scenic vistas from encroachment. The General Plan discusses the black sand beaches and tidal ponds as noted features of natural beauty in Puna, but among specific examples of natural beauty does not identify any features or views within several miles of the property. Coastal views from the Government Beach Road are totally obstructed by 1,000 feet of dense vegetation.

Impacts and Mitigation Measures

The project would not affect air quality or noise levels in any substantial ways. Brief and minor adverse effects would occur during construction. However, there are virtually no sensitive noise receptors in the vicinity, and given the small scale of the project, noise mitigation will likely not be necessary.

Because all grading and construction except enlargement of the driveway would occur hundreds of feet away from the *mauka* and *makai* edges of the property, with dense intervening vegetation on both sides, construction and occupation of the single-family home would have virtually no visual impacts. Inside the property, the attractive design of the home and the landscaping that will replace non-native with native

and Polynesian vegetation will enhance the scenic character of the property.

3.1.6 Hazardous Substances, Toxic Waste and Hazardous Conditions

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

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

3.2 Socioeconomic and Cultural

3.2.1 Land Use, Socioeconomic Characteristics and Recreation

Existing Environment

Because of the gradual occupation of lots developed during widespread land subdivision about fifty years ago, the Puna District where the Gapp property is located has been the Big Island's fastest-growing

district over the last thirty years. Population as measured in the 2010 U.S. Census was 45,326, a 66 percent increase over the 2000 count of 27,232. Despite a lack of basic infrastructure such as paved roads and water in most subdivisions, the relatively inexpensive lots, which typically range in size from one to three acres, have attracted residents from the U.S. mainland and other parts of the State of Hawai‘i seeking more affordable property. The basis of the economy of Puna has evolved from cattle ranching and sugar to diversified agriculture, various services for the growing populations, commuting to Hilo, and tourism, which has been stimulated by being home to Kilauea, one of the world’s most active volcanoes. Some of the subdivisions have become essentially bedroom communities for Hilo’s workforce, as evidenced by the heavy flow of Hilo-bound traffic during the AM rush hour.

The Gapp property is bordered by the shoreline to the north, by the Government Beach Road to the south, and by unoccupied private properties on the east and west. Across the Government Beach Road is pasture land owned by the Department of Hawaiian Home Lands (DHHL). The property is also very close to Hawaiian Paradise Park, one of the largest and most populous residential/ agricultural subdivisions in Hawai‘i, with 9,000-plus lots, and 11,404 residents according to the 2010 census. Like all other areas in Puna, there is a high demand for coastal recreation here. Despite the long coastline, there are few beaches in Puna, and in most location, ocean recreation consists primarily of fishing from the cliffs and enjoying limited bathing in tidepools. The tidepools at Auwae, a few hundred feet to the northwest of the shoreline edge of the property, are frequented by many local residents and the occasional tourist for sunbathing, fishing*, opihi* gathering, dipping in the water, and tidepool viewing. Pedestrian access to the Auwae tidepool area is either along the shoreline from the southeast end of Hawaiian Paradise Park via Ala Heiau Road or via an informal but long used trail on an old jeep road on the private, undeveloped lot directly northwest of the Gapp property (TMK 1-5-010:011). The shoreline in front of the Gapp property (see Figure 2) contains tidepools *makai* of the boulders and is used for fishing and gathering.

Impacts and Mitigation Measures

No adverse socioeconomic impacts are expected to result from the project. The project will have a very small positive economic impact for the County of Hawai‘i. The residence and associated improvements will not adversely affect recreation, as access along the coast and the path to the ocean that lie northwest of the property will undergo no changes or restrictions.

3.2.2 Cultural and Historic Resources

An archaeological inventory survey, burial treatment plan, preservation plan and cultural impact assessment have all been prepared for the property. The last three of these reports are presented in Appendices 3a-c (the archaeological inventory survey results are largely contained in the other reports and are thus not repeated) and summarized in the section below, which also includes information from other sources. Research for these studies included primary fieldwork, consultation of archaeological and ethnographical studies, and primary documents including maps and Mahele testimony. Also conducted was consultation of lineal and cultural descendants in the area, including Nicole Lui and Richard Ha. In the interest of readability, the summary below does not include all scholarly references; readers interested in extended discussion and sources may consult Appendices 3a-c.

Historical and Cultural Background

The first inhabitants of Hawai‘i were believed to be settlers who had undertaken difficult voyages across the open ocean. For many years, researchers have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawai‘i were underway by A. D. 300 (Kirch 1985), although recent work suggests that Polynesians may not have arrived in Hawai‘i until at least A. D. 1000 (Kirch 2010).

The initial inhabitants of Hawai‘i are believed to have come from the southern Marquesas Islands and settled initially on the windward side, eventually expanding to leeward areas. Early Hawaiian farmers developed new strategies and tools for their new environment (Kirch 1985; Pogue 1978). Societal order was maintained by their traditional philosophies and by the conical clan principle of genealogical seniority (Kirch 1984). Universal Polynesian customs brought from their homeland included the observance of major gods *Kane*, *Ku*, and *Lono*; the *kapu* system of law and order; cities of refuge, various superstitions, and the concepts of *mana* and the *‘aumakua* (Fornander 1969).

The Development Period, believed under Kirch’s new concept to have occurred from A. D. 1100 to 1350, brought an evolution of traditional tools, including a variation of the adze (*ko‘i*), and some new Hawaiian inventions such as the two-piece fishhook and the octopus-lure breadloaf sinker. That was followed by the Expansion Period (A. D. 1350 to 1650) which saw greater social stratification, intensive land modification, and population growth. This period was also the setting for the second major migration to Hawai‘i, this time from Tahiti. Also established during this period was the *ahupua‘a*, a land-use concept that incorporated all of the eco-zones from the mountains to the shore and beyond. The usually wedge-shaped *ahupua‘a* provided a diverse subsistence resource base (Hommon 1986) and added another component to what was already becoming a well-stratified society (Kirch 1985).

Ahupua‘a were ruled by *ali‘i ‘ai ahupua‘a* or lesser chiefs and managed by a *konohiki*. *Ali‘i* and *maka‘ainana*, or commoners, were not confined to the boundaries of *ahupua‘a* as resources were shared when a need was identified. *Ahupua‘a* were further divided into smaller sections such as *‘ili, mo‘o‘aina, pauku‘aina, kihapai, koele, hakuone* and *kuakua*. The chiefs of these land units have their allegiance to a territorial chief or *mo‘i* (literally translated as king) (Hommon 1986). The project site is located within Maku‘u Ahupua‘a, a land unit of the District of Puna, one of six major districts on the island of Hawai‘i.

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

As McGregor stated, “Puna is where new land is created and new growth and new life sprout. The new land is sacred, fresh, clean, and untouched. After vegetation begins to grow upon it, it is ready for human use.” (2007:145). In Precontact and early Historic times the people lived in a small number of small settlements along the coast where they subsisted on marine resources and agricultural products. Each of the villages, McEldowney notes:

> "…seems to have comprised the same complex of huts, gardens, windbreaking shrubs, and utilized groves, although the form and overall size of each appear to differ. The major differences between this portion of the coast and Hilo occurred in the type of agriculture practiced and structural forms reflecting the uneven nature of the young terrain. Platforms and walls were built to include and abut outcrops, crevices were filled and paved for burials, and the large numbers of loose surface stones were arranged into terraces. To supplement the limited and often spotty deposits of soil, mounds were built of gathered soil, mulch, sorted sizes of stones, and in many circumstances, from burnt brush and surrounding the gardens. Although all major cultigens appear to have been present in these gardens, sweet potatoes, ti (*Cordyline terminalis*), *noni (Morinda citrifolia*), and gourds (*Lagenaria siceraria*) seem to have been more conspicuous. Breadfruit, pandanus, and mountain apple (*Eugenia malaccensis*) were the more significant components of the groves that grew in more disjunct patterns than those in Hilo Bay" [1979:17].

Puna was a region famed in legendary history for its associations with the goddess Pele and god Kāne. Because of the relatively young geological history and persistent volcanic activity, the region has a strong association with Pele. However, the connection to Kāne is perhaps more ancient. Kāne, ancestor to both chiefs and commoners, is the god of sunlight, fresh water, verdant growth, and forests. It is said that before Pele migrated to Hawai‘i from Kahiki, Puna was esteemed the most beautiful place in the islands by many. Contributing to that beauty were the groves of fragrant hala and forests of *‘ōhi‘a lehua* for which Puna was famous. The inhabitants of Puna were likewise famous for their expertise and skill in *lauhala* weaving.

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

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

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

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

In 1823, British missionary William Ellis and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawaiʻi scouting communities in which to establish church centers for the growing Calvinist mission. Ellis recorded observations made during this tour in a journal (Ellis 1963). His writings contain descriptions of residences and practices elsewhere in Puna that are applicable to the general study area:

> "As we approached the sea, the soil became more generally spread over the surface, and vegetation more luxuriant. About two p.m. we sat down to rest. The natives ran to a spot in the neighbourhood, which had formerly been a plantation, and brought a number of pieces of sugar-cane, with which we quenched our thirst, and then walked on through several plantations of sweet potato belonging to the inhabitants of the coast . . . (Ellis 1963:182-183)
>
> The population in this part of Puna, though somewhat numerous, did not appear to possess the means of subsistence in any great variety or abundance; and we have often been surprised to find desolate coasts more thickly inhabited than some of the fertile tracts in the interior; a circumstance we can only account for, by supposing that the facilities which the former afford for fishing, induce the natives to prefer them as places of abode; for they find that where the coast is low, the adjacent water is usually shallow.
>
> We saw several fowls and a few hogs here, but a tolerable number of dogs, and quantities of dried salt fish, principally albacores and bonitos. This latter article, with their *poë* [*poi*] and sweet potatoes, constitutes nearly the entire support of the inhabitants, not only in this vicinity, but on the sea coasts of the north and south parts of the island.
>
> Besides what is reserved for their own subsistence, they cure large quantities as an article of commerce, which they exchange for the vegetable productions of Hilo and Mamakua [Hāmākua], or the *mamake* and other tapas of Ora [ʻŌlaʻa] and the more fertile districts of Hawaii.
>
> When we passed through Punau [Pānau], Leapuki [Laeapuki], and Kamomoa [Kamoamoa], the country began to wear a more agreeable aspect. Groves of coca-nuts ornamented the projecting points of land, clumps of kou-trees appeared in various directions, and the habitations of the natives were also thickly scattered over the coast . . ." (Ellis 1963:190-191).

A year after Ellis' visit, in 1824, the ABCFM established a base church in Hilo. From that church (Haili), the missionaries traveled to the more remote areas of the Hilo and Puna Districts. David Lyman, who came to Hawaiʻi in 1832, and Titus Coan who arrived in 1835, were two of the most influential Congregational missionaries in Puna and Hilo. As part of their duties they compiled census data for the

areas within their missions. In 1835, 4,800 individuals were recorded as residing in the district of Puna; the smallest total district population on the island of Hawai‘i. In 1841, Titus Coan recorded that most of the 4,371 recorded residents of Puna, lived near the shore, though there were hundreds of individuals who lived inland. One of the coastal settlement areas was Maku‘u, in the vicinity of the Gapp property.

In 1846, Chester S. Lyman, “a sometime professor” at Yale University visited Hilo, Hawai‘i, staying with Titus Coan (Maly 1998). Traveling the almost 100 mile long stretch of the “Diocese” of Mr. Coan, Lyman reported that the district of Puna had somewhere between 3,000 to 4,000 inhabitants (Ibid). Entering Puna from Hilo, and traveling to Kea‘au along the coast, Lyman offered the following observations:

> “The groves of Pandanus were very beautiful, and are the principal tree of the region. There is some grass and ferns, and many shrubs; but the soil is very scanty. Potatoes are almost the only vegetable that can be raised, and these seem to flourish well amid heaps of stone where scarcely a particle of soil could be discovered. The natives pick out the stones to the depth often of from 2 to 4 feet, and in the bottom plant the potato–how it can expand in such a place is a wonder.
>
> Nearly all Puna is like this. The people are necessarily poor—a bare subsistence is all they can obtain, and scarcely that. Probably there are not $10 in money in all Puna, and it is thought that not over one in five hundred has a single cent. The sight of some of these potatoe patches would make a discontented N.E. farmer satisfied with his lot. Yet, I have nowhere seen the people apparently more contented & happy” (Maly 1998:35).

The *Mahele ‘Aina* took place in 1848, placing all land in Hawai‘i into three categories: Crown Lands, Government Lands and Konohiki Lands. Ownership rights were “subject to the rights of the native tenants,” or those individuals who lived on the land and worked it for their subsistence and for their chiefs. As a result of the Māhele of 1848, the *ahupua‘a* of Maku‘u was retained as Government Lands, and no *kuleana* parcels were awarded in the *ahupua‘a*. Between 1852 and 1855 portions of the *ahupua‘a* were divided and sold as fee simple Land Grants. The Land Grants were sold to Native tenants who were interested in acquiring the land upon which they lived, or land that they felt they could cultivate. The Gapp property is a portion of Lot 1 of Grant No. 1013 to D.W. Maiau.

In 1848, the Hawaiian Government also conducted a survey of schools on the Island of Hawai‘i. The survey included a school in Maku‘u Ahupua‘a. The location of the Maku‘u school lot is not known from any maps, but interestingly, the 1848 school report lists Maiau, who received Grant No. 1013, as the teacher in Maku‘u. The report lists Maiau’s salary as 12½ cents per day, the number of students taught as 18, and the subjects taught as reading, arithmetic, geography, penmanship, philosophy, science, and religion (Maly 1999:63). The school continued until about 1891, according to reports.

By 1873, the Government Road from Hilo through Puna had been completed to at least Maku‘u (Maly 1999). The road likely followed the route of an older pedestrian trail. Cattle ranching got its start in the area around this time. In 1872, Obed B. Spencer, a rancher, leased the massive Kea‘au Ahupua‘a northwest of Maku‘u Ahupua‘a from Charles Kanaina and Charles R. Bishop, guardians of William C.

Lunalilo for a term of ten years beginning September 1, 1873. Spencer then transferred the lease and sold his personal property to J.O. Dominis and R. A. Lyman. In 1874, the two men expanded into additional *ahupua'a*, including Makuʻu, Hālona, Keoneopoko Iki, Kaʻohe, and Pōpōkī for a term of ten years (Maly 1999). After several more transfers, by 1879 J. Elderts and W.H. Shipman's Keaʻau Ranch included most of the lands between Keaʻau and Kapoho Ahupuaʻa (Cahill 1996).

On February 28th, 1876, the Boundary Commission heard testimony from Palau, a resident of Makuʻu, concerning the boundaries of Waikahekahe Iki Ahupuaʻa (along the northwestern boundary of Makuʻu Ahupuaʻa). Palau's statement for the adjacent property provides a fascinating glimpse into the deep knowledge and presumed utility of local botanical and geological features:

> "…I was born at Waikahekaheiki Puna, Hawaiʻi, at the time of Niaukani o Kalii (ca. 1811) and was grown up when missionaries first came to Hilo. I now live at Makuu the adjoining land. Have always lived on these two lands. I am a kamaaina of Waikahekaheiki. My mother Mau was a kamaaina of the land, and showed me the boundaries. The boundary at the shore between this land and land of Makuu, is at a kaulapa [a ridgeline or point] called Kuwelu [Kuʻuwelo], there is also a mauwae [fissure] there: Thence the boundary runs mauka along the Kaulapa to the end of it, and on across the Govt. road to an ahu Pahoehoe [pāhoehoe rock cairn] near the road; thence mauka to old road to an ahu pohaku [stone cairn] at place called Kaumanumanu, thence mauka across old pahoehoe to the pili place called Kulanapahu. Thence to pili on Hilo side of grove of breadfruit trees at place called Kahoolua. Thence mauka to pili on Hilo side of Puunanaio, a breadfruit tree and old mahina ai [cultivated field]. Thence boundary runs mauka across pahoehoe to place called Papamaihi ani oioina [trail side resting place] on the old road from Kaimu. Thence mauka to Puna side (or Kau side) of where houses used to be at old cultivating ground at place called Wahileolae. The point of woods called Makaohe are on Makuu, and part of pahoehoe. Thence the boundary runs mauka to old road from Kaunamano to Kalae, where I was told Waikahekaheiki ends. This land is bounded makai by the sea. The ancient fishing rights extend way out to sea…" (Volume B:399-400 in Maly 1999:56-57).

In 1877, H.R. Hitchcock, the Inspector General of schools, reported that the schools in Puna had deteriorated from their former good standing owing to the resignation of some of the best teachers (Maly 1999:83). He noted that "the schools in Keauhou and Makuu are both very small, and as they are within three miles of each other, I have told the school agent to unite the two under one teacher, who shall teach two or more hours at each place, daily" (in Maly 1999:83). Hitchcock also described the difficulty students had keeping animals out of their fields (the produce from the fields was used to finance the school's operation). Typically, to keep the animals out, they had to enclose the school lots with high walls and not include a gateway.

Around this time Henry M. Whitney, editor of the Hawaiian Gazette began publishing promotional guides of Hawaiʻi to encourage tourism to the Islands. In 1890 he published an account of travel along the Hilo and Puna coastal road. He observed that at "Makuu, 15 miles from Hilo, there is quite a little settlement" (Whitney in Maly 1999:40). A survey for a new inland road through Puna District was completed in 1891. Prof. W. D. Alexander, the Surveyor General for this Hawaiian Government Survey, included several

interesting notes on the terrain, vegetation, and population distribution of Makuʻu Ahupuaʻa and neighboring lands in his report on the progress of the survey. He noted the sparse *ʻohiʻa* forests, the numerous *ʻawa* and banana shrubs, the occasional remaining inhabitant, and the ever-worsening state of the coastal road.

Land use in the Puna District changed quickly in the late 19th century. By 1900, the new inland highway had been completed. Between 1894 and 1900, W. H. Shipman, who had by that time acquired sole interest in Keaʻau Ahupuaʻa and neighboring lands, sold nearly 4,000 acres to various individuals for the cultivation of coffee and in 1899 he leased nearly 4,000 acres to the Olaʻa Sugar Company, Ltd. (Maly 1999). In 1901, 1911, and 1912, A. B. Loebstien and T. Cook surveyed the boundaries of Shipman's lands. Many of the informants for the surveys were native residents of Keaʻau and Makuʻu. Interestingly, Grant No. 1013, of which the Gapp property is a part, was transferred in the early 1900s to Keanalia Puʻukoholā, one of the informants for T. Cook (Maly 1999). Register map No. 2258 (ca. 1903) shows a single house within the boundaries of Grant No. 1013:1 (see Figure 6 of CIA in Appendix 2). The house is located in the southern corner of the grant boundary near the Government Beach Road, outside of the Gapp property. A 1924 Makuʻu U.S.G.S. Quadrangle map shows two different houses within the grant parcel; both are located in the northern corner of the parcel near the coast, outside the Gapp property.

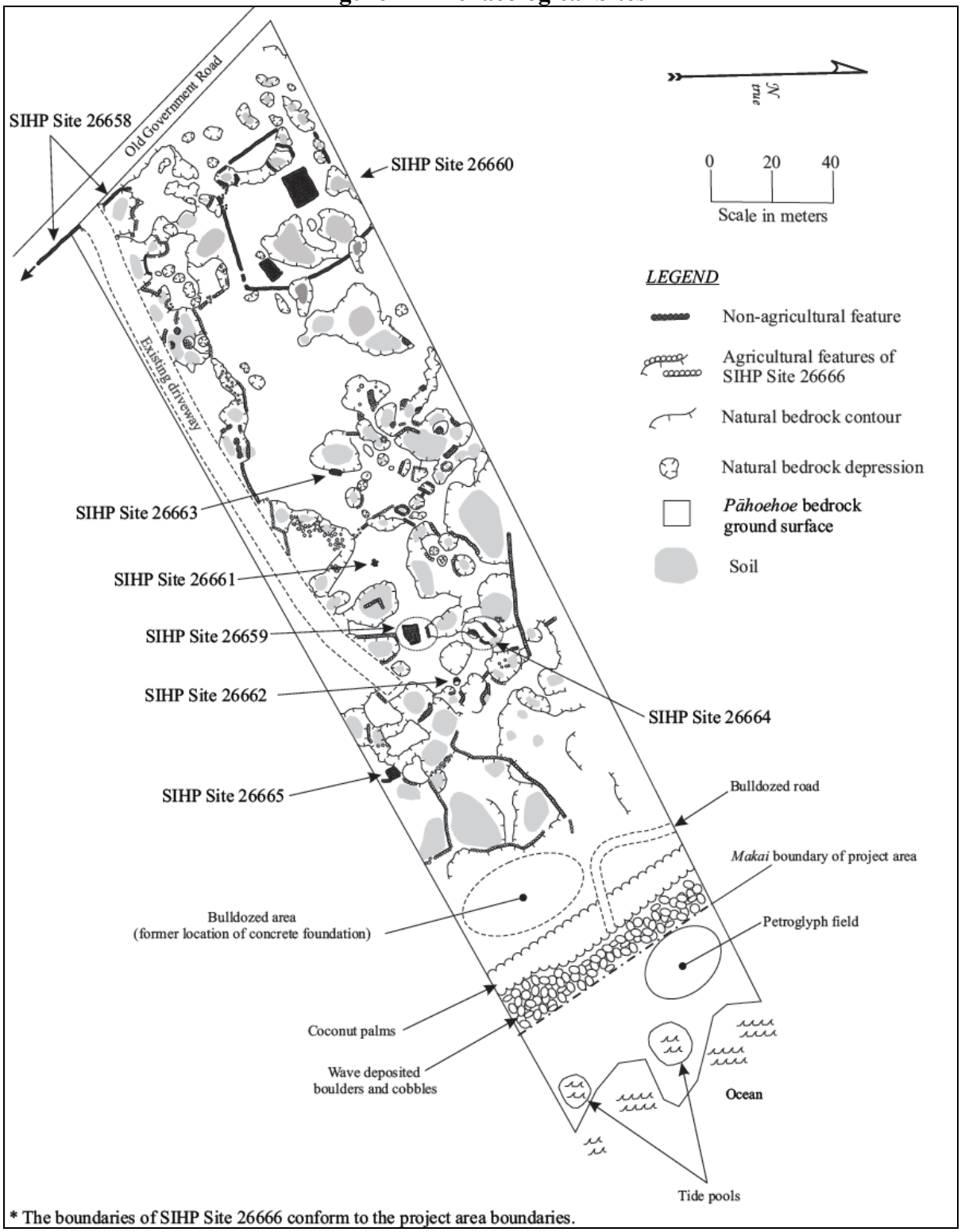
During the early part of the 20th century the Puna District underwent further and even more drastic changes. The native system of agricultural had nearly completely disappeared as a result the drastic population decline, and ranching, sugarcane, coffee, and lumber became the dominant industries. The Keaau Ranch had begun grazing cattle as early as the 1850s and ranching operations continued to expand during this time. The Olaa and Puna Sugar Companies operated in Puna from 1900 until the 1980s. Beginning in 1900, railroad tracks were laid by the Hawaii Railway Company for hauling sugarcane (and passenger travel) from the fields in lower Puna to the mills in Pahoa and Keaʻau. The railroad passed through Makuʻu Ahupuaʻa several miles *mauka* of the shore, stopping at the Makuʻu Station house. The railroad ceased operations in 1946. By 1950, most inhabitants of this part of the Puna coast moved away.

Archaeological Investigations and Resources

As perhaps indicated by the cultural and historical background, the diverse activities on and about the current Gapp property throughout several eras can be expected to have left abundant remains. The property was subject to an archaeological inventory survey conducted by Rechtman Consulting, LLC (Clark et al. (2008), as a result of which, nine archaeological sites containing sixty-seven features were recorded. Table 1 summarizes information about the sites, details of which can be found in Appendices 2a-c. As can be seen in Figure 4, the sites are distributed in most areas of the property except the *makai*-most area.

The two habitation sites (Sites 26659 and 26660) and the modified bedrock hole (Site 26661) are located on a raised linear spine of pahoehoe bedrock that runs from the Government Beach Road to the *makai* portion of project area near the coast. This area is elevated so that it stays dry during times of heavy rain, and it provides the easiest *mauka-makai* pedestrian access across the parcel. The bedrock ground surface is also unsuitable for agriculture, as very little soil is present. The remaining sites and features are

Figure 4 Archaeological Sites



* The boundaries of SIHP Site 26666 conform to the project area boundaries.

constructed along the north and south edges of this raised bedrock spine, or within natural, vertical sided depressions in the bedrock. Three of the depressions have overhanging edges that were blocked with walls to conceal Historic Period burials (Sites 26662, 26663, and 26664). Nearly all of the depressions contain at least thin soil, and many have been cleared and modified along their edges for planting purposes.

Table 1 Archaeological Sites

SIHP Site #*	***Formal Type***	***Functional Type***	***Temporal Association***
26658	Core-filled wall	Ranching/boundary	Historic
26659	Enclosure/pavement	Habitation	Historic
26660	Complex	Habitation	Historic
26661	Modified bedrock hole	Water collection/storage	Historic
26662	Concealed overhang	Burial	Historic
26663	Concealed overhang	Burial	Historic
26664	Concealed overhang	Burial	Historic
26665	Platform	Burial	Precontact
26666	Complex	Agriculture	Precontact/Historic

*All SIHP site numbers within the project area are preceded by the state, island, and quad prefix 50-10-45.

Evidence of Historic Period use of the project area is more prevalent at the recorded sites than Precontact Period use. Use of only one recorded site appears to date solely to Precontact times – Site 26665, a burial platform. It is likely however, that Precontact use was just as widespread, but that it was obscured by later Historic use. The features of the agricultural complex (Site 26666) appear to embody the formal attributes of both periods. These features were adapted over time, and new features were built, to suit the changing needs of the residents of this area, such as the need to keep cattle and goats out of agricultural areas. Evidence of Modern use of the project area is also widespread. Numerous plastic grow bags, fertilizer bags, plastic water bottles, and related agricultural items are littered on ground surface within the project area. Modern cultivation and bulldozing within the project area has likely affected some of the recorded features.

The archaeologist performing the inventory survey assessed the two habitation sites and the four burial sites as significant for preservation. The archaeologist's assessments and recommendations were concurred with by the State Historic Preservation Division. For preservation purposes, the sites were grouped into four preservation areas. Two of the preserve areas are exclusively in the Agricultural District portion of the parcel, one is within the Conservation District portion of the parcel, and one spans both Districts (see Figure 14 in Appendix 3a for map of preservation areas). Follow-up preservation plans (see Appendices 3b-c) were prepared for these six sites by Scientific Consultant Services, Inc.

Impacts and Mitigation for Archaeological Resources

Because of the widespread archaeological sites on this property, which is adjacent to a popular shoreline recreation area and has already experienced degradation of sites through inadvertent and careless grading, trash dumping, and marijuana cultivation, protection of the sites will require implementation of the

preservation plans and other precautions prior to construction. The presence of full-time residents, if they are mindful of the importance of preserving the sites, can actually assist in preservation through preventing unauthorized use.

The preservation plan for Site 26660 specified interim preservation measures that include setting up orange construction fencing around the site to create a 20-foot buffer zone within which no development activities can take place. Permanent preservation at this site will include delineating the 20-foot buffer with either a gated fence and/or natural landscaping barrier. The burial treatment plan was prepared for Sites 26662, 26663, 26664, and 26665, and was expanded to include the non-burial site 26659. Sites 26662, 26664, and 26659 are all contained within a single preserve area that measures 40 feet by 30 feet, with a 20-foot buffer measured from the outer edges of each site. Sites 26663 and 26665 each have a buffer of 20 feet from their outer edges. In addition to the buffers around the three-foot preservation buffer. Access to the burial sites by formally recognized lineal and/or cultural descendants is to be allowed with prior permission from the landowner.

In addition, both of the preservation plans specify that an archaeological monitor will be present during all earth-moving activities associated with development of the parcel. As a further precaution, in the unlikely event that additional undocumented archaeological resources, including shell, bones, midden deposits, lava tubes, or similar finds, are encountered during construction within the project site, it is recommended that work in the immediate area of the discovery shall be halted and SHPD contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

In order to ensure that impacts are avoided, it is recommended that full implementation of the preservation plan within a designated period of time, as well as the additional precautions listed above, be required as a condition of the Conservation District Use Permit for the single-family residence.

Other Cultural Resources and Practices

The burials and archaeological sites are significant culturally important resources on the property. The investigations of the property and its history did not reveal any cultural resources or practices aside from these resources. The consulted individuals with ties to and history with the area did not have any information concerning the specific property, but they did have many memories of traditional gathering and fishing on the shoreline with extended family. Fishing and gathering still occur on the shoreline *makai* of the property in an area. While some users are newcomers simply engaging in recreation and/or collecting food, others have deeper ties and are undertaking cultural practices as well. The Gapp property does not contain any springs, *pu‘u*, or caves (other than the burial overhangs) that might be important cultural sites. The dense vegetation consists mainly of weedy trees and herbs with no cultural values or associations. However, the coconut grove on the shoreline provides nuts that fall onto the coastal basalt shelf and can continue to be used, and the *hala* adjacent to the shoreline can potentially be utilized.

Impacts and Mitigation Measures to Other Cultural Resources

The burials and archaeological sites are the most significant cultural resources on the property. Adverse effects can be completely prevented through implementation of the Burial Treatment Plan and archaeological site preservation plan, as well as precautionary measures specified above. The applicants recognize the responsibility to allow visitation by recognized lineal descendants and to perpetually preserve the burial sites. The Gapps have proactively coordinated with lineal descendant Nicole Lui, who endorsed the decision to locate the home closer to the shoreline and away from the burials, so that lineal descendants visits to the burial area are facilitated and do not require any disturbance of the residents of the home (see emails in Appendix 1a). Ms. Lui also requested that the coconut and *hala* areas be somewhat preserved. Shoreline access and the cultural activities this affords will not be affected. The thick grove coconuts and *hala* present in the 40-foot shoreline setback would not be affected.

It is reasonable to conclude, based upon the limited range of resources and the proposed mitigation to all affected resources, that the exercise of native Hawaiian rights related to gathering, access or other customary activities will not be affected, and there will be no adverse effect upon cultural practices or beliefs. This Draft EA was distributed to agencies and groups who might have knowledge in order to confirm this finding. None provided further information on cultural practices, resources or impacts.

3.3 Public Roads, Services and Utilities

3.3.1 Roads and Access

Existing Environment, Impacts and Mitigation Measures

The sole access to the project site is from the Government Beach Road, an unimproved, narrow, mostly unpaved public roadway extending from Beach Road in Hawaiian Paradise Park to Papio Street in Hawaiian Shores Recreational Estates to Kapoho (see Figure 1a and 1b).

3.3.2 Public Utilities and Services

Environmental Setting, Impacts and Mitigation Measures

Electricity and telephone poles and lines are present on Government Beach Road, and these services would be extended through underground conduits along the driveway to service the home. Domestic water supply would be through a water well, as utilized by many ~~catchment, the most common method used by thousands of~~ properties nearby in Hawaiian Paradise Park. Wastewater would be treated with a septic system in conformance with requirements of the State Department of Health (see Figure 3 for location). No parks, schools or other public facilities are present nearby. Police, fire and emergency medical service are available about ten miles away in Pahoa or Keaau.

There will be no adverse impact to any public or private utilities. The addition of one single-family home will have no measurable adverse impact to or additional demand on public facilities such as schools,

police or fire services, or recreational areas. The applicants acknowledge and understand that this lot, along with others in this part of the Puna District, is remote from emergency services. In a comment letter to the Draft EA, the Fire Department provided applicable standards from the Fire Code (see Appendix 1b). Many of the standards related to commercial buildings in urban areas with access to municipal water supplies. For single-family homes in the rural Puna District, where municipal water systems are very limited, the standards at 18.3.8, including sections (1)-(3) and (5)-(6) apply, dealing with minimum tank size, pipe sizes, tank and valve construction and location, and inspection and maintenance. The applicant will provide a minimum 12,000-gallon water tank devoted expressly for firefighting purposes. It should be noted that when water variances to allow the use of water catchment system are issued by the County of Hawai‘i Planning Department, the Department – based on input from the Water and Fire Departments – require a minimum 9,000 gallon water storage system, 6,000 gallons of which would be for potable purposes and the remaining 3,000 for firefighting and emergency purposes. Further, the location and capacity of the emergency water system, including the necessary compatible connector system, has to meet with the approval of the Hawai‘i County Fire Department. The applicant will abide by these standards.

3.4 Secondary and Cumulative Impacts

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

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. There are a number of single-family homes located on this section of Government Beach Road, and occasionally there are two or more houses under construction. Although the County of Hawai‘i in the past has discussed the possibility of paving and minor widening of the Government Beach Road, at this time there are no plans to do so. The adverse effects of building a single-family residence in this context are very minor and involve temporary disturbances to air quality, noise, traffic and visual quality during construction. It should again be noted that the proposed home is in a somewhat isolated, sparsely populated area, and no accumulation of adverse construction effects would be expected. Other than the precautions for preventing adverse impacts during construction listed above in Sections 3.1.3 and 3.1.6, no special mitigation measures should be required to counteract the small adverse cumulative effect.

3.5 Required Permits and Approvals

County of Hawai‘i:

Special Management Area Exemption (obtained)
Plan Approval and Grubbing, Grading, and Building Permits

State of Hawai‘i:

Conservation District Use Permit
National Pollutant Discharge Elimination System Permit (potential)
Well Permits from Commission on Water Resources Management

3.6 Consistency With Government Plans and Policies

3.6.1 Hawai‘i County Land Use Designations and General Plan

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

ECONOMIC GOALS

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

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

ENVIRONMENTAL QUALITY GOALS

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

ENVIRONMENTAL QUALITY POLICIES

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

ENVIRONMENTAL QUALITY STANDARDS

(a) Pollution shall be prevented, abated, and controlled at levels that will protect and preserve the public

health and well being, through the enforcement of appropriate Federal, State and County standards.
(b) Incorporate environmental quality controls either as standards in appropriate ordinances or as conditions of approval.
(c) Federal and State environmental regulations shall be adhered to.

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

HISTORIC SITES GOALS

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

HISTORIC SITES POLICIES

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

Discussion: The archaeological inventory survey and burial treatment plan have properly documented and mitigated impacts to historic sites and provided fuller protection to a Hawaiian cultural resource.

FLOOD CONTROL AND DRAINAGE GOALS

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

FLOOD CONTROL AND DRAINAGE POLICIES

(a) Enact restrictive land use and building structure regulations in areas vulnerable to severe damage due

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

FLOOD CONTROL AND DRAINAGE STANDARDS

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

Discussion: The property is within the Zone X, or areas outside of the 500-year Floodplain as determined by detailed methods in the community flood insurance study, according to the Flood Insurance Rate Maps (FIRM). The project will conform to applicable drainage regulations and policies of the County of Hawai‘i.

NATURAL BEAUTY GOALS

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

NATURAL BEAUTY POLICIES

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

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

NATURAL RESOURCES AND SHORELINES GOALS

(a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
(b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.

(c) Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.
(d) Protect rare or endangered species and habitats native to Hawaii.
(e) Protect and effectively manage Hawaii's open space, watersheds, shoreline, and natural areas.
(f) Ensure that alterations to existing land forms, vegetation, and construction of structures cause minimum adverse effect to water resources, and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.

NATURAL RESOURCES AND SHORELINES POLICIES

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

Discussion: The home would be set back as far as feasible on the lot, about 200 feet from the shoreline ~~(with the cabana/pavilion about 60 feet away),~~ at an elevation of about 15 feet above sea level, and would not affect shoreline resources or be damaged by waves or tides.

3.6.2 Hawai‘i County Zoning and Special Management Area

The State Land Use District for the area for the area of the property proposed for the single-family home is Conservation. *Mauka* of this coastal portion the property is within the State Land Use Agricultural District. The entire property is zoned by the County of Hawai‘i as within the Agricultural District, minimum lot size of one acre (A-1a), although County zoning does not apply in the Conservation District portion of the property. No aspect of the project appears to be inconsistent with County zoning.

The entire property is within the Special Management Area. Single-family residences may be determined to be an exempt action under the County's Special Management Area (SMA) guidelines. The County of Hawai‘i Planning Department requires preparation of an SMA Assessment Application, in which SMA issues are expressly dealt with. A summary of consistency is provided below.

The proposed land use complies with provisions and guidelines contained in Chapter 205A, Hawai‘i Revised Statutes (HRS), entitled *Coastal Zone Management*. Single-family residences may be determined to be an exempt action under the County's Special Management Area (SMA) guidelines. The proposed use would be consistent with Chapter 205A because it would not affect public access to recreational areas,

historic resources, scenic and open space resources, coastal ecosystems, economic uses, or coastal hazards.

The proposed improvements are not likely to result in any substantial adverse impact on the surrounding environment. The house site is set back from the shoreline and will not restrict any shoreline uses such as hiking, fishing or water sports. Lateral pedestrian use of the shoreline area will not be impacted and there will be no effect on the public's access to or enjoyment of this shoreline area. Furthermore, viewplanes towards the project site will not be adversely impacted in any substantial way, as views from the Government Road are totally blocked by trees. It is expected that the project will not result in any impact on the biological or economic aspects of the coastal ecosystem. The project site is not situated over any natural drainage system or water feature that would flow into the nearby coastal system. The property contains mostly non-native and a few common native plants. No floodplains are present in the area. In terms of beach protection, construction is set back from the shoreline and would not affect any beaches nor adversely affect public use and recreation of the shoreline in this area. No impacts on marine resources are likely to occur. Historic sites and cultural uses have been properly assessed.

The Planning Director has made the determination that the proposed development of a single-family home is not considered a "development" under Special Management Area Rules and Regulations of the County of Hawai'i, Section 9-4 (10) (B) (see Appendix 1b for letter).

3.6.3 Conservation District

The State Land Use District for the *makai* third of this property and adjacent properties is Conservation, as illustrated on Figure 3. Its subzone is Resource, for which, according to Hawai'i Administrative Rules (HAR) §13-5-15, a single-family residence is an identified use. The portion of the property proposed for use is in the State Land Use Conservation District, Resource subzone. Any proposed use must undergo an examination for its consistency with the goals and rules of this district and subzone. The applicant has concurrently prepared a Conservation District Use Application (CDUA), to which this EA is an appendix. The CDUA includes a detailed evaluation of the consistency of the project with the criteria of the Conservation District permit process. Briefly, the following individual consistency criteria should be noted:

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

The development of the single-family residence is in conformance with the purpose of the Conservation District. The proposed use of the subject property for a single-family residence is an identified use within the Conservation District, requiring a Board Permit for such use. A commitment by the applicants to management of the site will conserve, protect and preserve the natural features on the subject property. The proposed use will not impact the lateral public access or the public's ability to utilize the coastal resources that front this property. Additionally, due to the careful and limited nature of the proposed development, there would be no significant impacts to the natural or cultural resources of the area.

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

The objective of the Resource subzone "…*is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas."* This identified use, which conforms to the design standards in 13-5-41, will ensure the sustained use of the natural resources in the project area by mitigating potential impacts as outlined in this document. Single-family residences are an identified use in the Resource subzone under HAR 13-5-24, R-8.

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

The proposed land use complies with provisions and guidelines contained in Chapter 205A, Hawai‘i Revised Statutes (HRS), entitled *Coastal Zone Management*, as discussed above in Section 3.6.2.

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

Because of the relatively minor nature of the project and the lack of native terrestrial ecosystems and threatened or endangered plant species, construction and use of the property for a single-family residence is not likely to cause adverse biological impacts. Impacts to the island wide-ranging endangered Hawaiian hoary bat and Hawaiian Hawk will be avoided through timing of vegetation removal and/or hawk nest survey. The applicants are planning to implement modest landscaping of the property, which, in part, is intended to minimize the visual impact of the structure as seen from adjacent public areas. Additionally, the construction of the proposed residence will allow for the management of the property, including preventing illegal dumping and inappropriate entry into the area containing the burial site. No effect on any coastal ecosystem will occur, because of the extensive vegetated area fronting the proposed home site, and the planned precautions for preventing soil runoff during constructions. The proposed action will also have no impact on the public's current access to or use of the shoreline area.

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

The proposed use is consistent with single-family residential use in the area. The home will have low-key design of one story with 5,000 square feet total for all features, set back 200 feet from the shoreline in an area that will not be visible to the public. This identified use, which conforms to the design standards in HAR 13-5-41, will ensure the sustained use of the natural resources in the project area by mitigating impacts. The use will not adversely affect the surrounding properties or how these properties are utilized.

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

The proposed use of the subject property for a single-family residence and commitment to management of the site will help conserve, protect and preserve the natural features of the area. Although some vegetation, including mostly non-native trees but also *hala* and few coconut trees, will be removed to provide an area for the home, the physical beauty characteristics of the existing lot will be enhanced by landscaping with native species, including *hala*.

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

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

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

The general area is already in use for recreation by the public and the proposed single-family residence will not be detrimental to the public health, safety, and welfare.

PART 4: DETERMINATION, FINDINGS AND REASONS

4.1 Determination

Based on the findings below, and upon consideration of comments to the Draft EA, the Hawai‘i State Board of Land and Natural Resources is expected to determine that the Proposed Action will not significantly alter the environment, as impacts will be minimal, and is expected therefore to issue a Finding of No Significant Impact (FONSI).

4.2 Findings and Supporting Reasons

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resource would be committed or lost. Common native plants are present but native ecosystems would not be adversely affected. Valuable cultural resources in the form of four burial sites and archaeological sites will be preserved in place with more protection than exists currently. No valuable cultural resources and practices such as coastal access, fishing, gathering, hunting, or access to ceremonial sites would be affected in any way.

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

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

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

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

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

7. *The proposed project will not involve a substantial degradation of environmental quality*. The project is minor and environmentally benign, and thus it would not contribute to environmental degradation.

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

9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The adverse effects of building a single-family residence are very minor and temporary disturbance to traffic, air quality, noise, and visual quality during construction. This area is fairly isolated from other residences, and no accumulation of adverse construction effects would be expected. Other than the precautions for preventing adverse effects during construction listed above, no special mitigation measures should be required to counteract the small adverse cumulative effect.

10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No substantial effects to air, water, or ambient noise would occur. Brief, temporary effects would occur during construction and would be mitigated.

11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* The proposed home is not located in a flood zone. The project site is about 15 feet above sea level and about 200 feet from the shoreline, outside the area historically affected by tsunami.

12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic views are located nearby or would be affected in any way. Coastal views from the Government Beach Road are totally obstructed by 1,000 feet of dense vegetation. The attractive

design of the home and the landscaping, given the existing context in which the home would not be visible from public vantage points, would not materially degrade the scenery of the project area.

13. *The project will not require substantial energy consumption*. Negligible amounts of energy input would be required for construction.

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ENVIRONMENTAL ASSESSMENT

GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

APPENDIX 1a
Comments in Response to Early Consultation/SHPD Letters

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William P. Kenoi
Mayor

Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

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

August 9, 2011

Mr. Ron Terry
Geometrician Associates
P. O. Box 396
Hilo, Hawai'i 96720

Dear Mr. Terry:

SUBJECT: CONSULTATION OF PROPOSED SINGLE FAMILY HOME IN MAKU'U CONSERVATION DISTRICT (TMK 1-5-010:032)

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

Thank you for allowing us the opportunity to comment.

If there are any questions regarding this matter, please contact Captain Samuel Jelsma, Puna District Patrol, at 965-2716.

Sincerely,

HENRY J. TAVARES, JR.
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

SJ:lli

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

REF:OCCL:DH

Correspondence: HA-12-20

AUG 1 2 2011

Ron Terry, Principal
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry,

SUBJECT: Consultation for Environmental Assessment for Gapp's Proposed Single Family Residence (SFR), Puna District, Island of Hawaii, Subject Parcel TMK: (3) 1-5-010:032

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter, dated August 2, 2011, regarding the consultation for the Environmental Assessment for the Gapp's proposed SFR, Puna District, Island of Hawaii, Subject Parcel TMK: (3) 1-5-010:032.

According to your information, your client proposes to construct a one story SFR (three bedrooms, three bathrooms), garage, pool, and cabana. Other features include a driveway, walkways, and a fenced garden.

The OCCL notes the subject parcel is located in the State Land Use (SLU) Conservation District, Resource subzone. The OCCL notes the Department looks forward to the submittal and processing of your Conservation District Use Application (CDUA) and Draft Environmental Assessment (DEA) for the proposed project.

The OCCL notes there are proposed amendments to Chapter 13-5, Hawaii Administrative Rules (HAR) that are scheduled for the August 12, 2011 BLNR meeting. Should the BLNR approve the amendments to Chapter 13-5, HAR, the SFR design standards will change. Therefore, please refer to Exhibit 4 to ensure the proposed project will comply with the proposed amendments to Chapter 13-5, HAR. Should you wish to review the changes they can be found at: http://hawaii.gov/dlnr/occl/documents-forms/rules/13-5Final.pdf. Should you have any questions, please feel free to contact Dawn Hegger, Senior Planner of our Office of Conservation and Coastal Lands at 587-0380.

Sincerely,

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

c: HDLO/County of Hawaii Planning Department

William P. Kenoi
Mayor

Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

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

August 22, 2011

Mr. Ron Terry
Geometrican Associates, LLC
PO Box 396
Hilo, Hawai'i 96721

SUBJECT: EARLY CONSULTATION FOR ENVIRONMENTAL ASSESSMENT FOR SINGLE-FAMILY HOME IN THE CONSERVATION DISTRICT AT MAKU'U, PUNA DISTRICT, ISLAND OF HAWAI'I
TMK: 1-5-010:032

In regards to the above-mentioned early consultation Environmental Assessment, no special environmental impacts or conditions however the Fire Department would require the following, at a minimum:

Fire apparatus access roads shall be in accordance with UFC Section 10.207:

"Fire Apparatus Access Roads

"Sec. 10.207. (a) **General.** Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section.

"(b) **Where Required.** Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building.

"**EXCEPTIONS:** 1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified.

"2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b).

"3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired.

"More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

"For high-piled combustible storage, see Section 81.109.

"(c) **Width.** The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction.

"(d) **Vertical Clearance.** Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.

"**EXCEPTION:** Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.

"(e) **Permissible Modifications.** Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access.

"(f) **Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons)

"(g) **Turning Radius.** The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet)

"(h) **Turnarounds.** All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

"(i) **Bridges.** When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus.

"(j) **Grade.** The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%)

"(k) **Obstruction.** The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times.

"(l) **Signs.** When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both."

DARRYL OLIVEIRA
Fire Chief

GA:lpc

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

08030PJF.11

August 25, 2011

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

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment (EA) for Single-Family Home in the Conservation District at Maku`u Puna District, Island of Hawaii, Hawaii TMK: (3) 1-5-010:032

The Department of Health, Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving
   State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for an NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. This includes areas used for a construction base yard and the storage of any construction related equipment, material, and waste products. An NPDES permit is required before the start of the construction activities.

a. Hydrotesting water.

b. Construction dewatering effluent.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

3. For other types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 1 or Class AA waters, an NPDES individual permit will need to be obtained. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://hawaii.gov/health/environmental/water/cleanwater/forms/environmental/water/cleanwater/forms/indiv-index.html.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage is required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Darryl Lum TA for

ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:ml

c: DOH-EPO #11-155 [via email only]

Aloha Ron- The Office of Hawaiian Affairs is in receipt of your August 2, 2011 letter seeking comments ahead of a draft environmental assessment (DEA) which will be prepared to support a CDUA for the construction of an SFR on a 5.586 acre property in Maku'u on the Island of Hawai'i. Based on the information within your letter, it is our understanding approximately 4 acres of the property are within the State Land Use Agriculture District and the remaining is in the State Land Use Conservation District.

While we understand that the burial and archaeological sites referenced in your letter are within the Agricultural District, we do look forward to seeing some discussion on the preservation/mitigation plans for these sites discussed and/or referenced in the DEA. We do note that by letter dated April 27. 2009 OHA provided comments to Scientific Consulting Services, Inc., who we understood was preparing a burial treatment and preservation plans for certain sites situated on this tax map key parcel. These may be the plans reference in your letter and we seek confirmation the Burial treatment Plan has been presented to the Hawaii island Burial Council and the preservation plan has been approved by the SHPD.

OHA suggests that native plant species adapted to the area be considered in landscaping designs. The DEA should also include a discussion on how adverse impact to lateral shoreline access will be avoided.

We have no additional comments at this time. We do request that one electronic copy of the DEA be sent to OHA attn: Compliance Monitoring Program when it becomes available.

Please feel free to contact me with any questions.

Thanks, Keola

Keola Lindsey
Office of Hawaiian Affairs
Compliance Monitoring Program
711 Kapiolani Boulevard
Honolulu, Hawaii 96813
keolal@oha.org (email)
(808) 594-0244 (office)

From: Maureen M Gapp <maureen@ilhawaii.net>
To: nicolelui38@yahoo.com
Sent: Monday, September 19, 2011 7:07 AM
Subject: Maureen Gapp

Aloha Nicole, It was so nice to speak with you last week. I met with Ron Terry at the property this weekend. He is doing the environmental assessment of the property. Our plan is to build on the makai side of the property and to leave most of the Mauka area untouched. This would preserve the old Makuu school foundation, the old walls and the two burial sites. Ron mentioned that DLNR could ask us to build on the mauka portion.

The property is primarily zoned agricultural and the area 300 feet up from the shoreline is conservation. We feel it makes more sense to build closer to the ocean in the conservation area so that we can leave all the historically significant areas untouched and the grave sites accessible to the descendants. I would like to ask you for a letter from you on behalf of your ohana stating that you would agree that we build closer to the ocean and not between the grave sites. Ron Terry and I feel that it is important to get input from your family. I have included a copy of the Burial treatment plan for you to look at. Pages 4-5 show the maps of the property and where we would build.

Thank you for any assistance you can give us. Maureen Gapp
My mailing address is PO Box 1128 Pahoa, HI 96778

From: **Nicole Lui** <nicolelui38@yahoo.com>
Date: Sep 30, 2011
Subject: Re: Letter in agreement to build oceanfront
To: Maureen M Gapp <maureen@ilhawaii.net>

Aloha and To whom it may concern-

I Nicole, on behalf of the Lui Ohana would like to first , thank you and your family for including us in your decision to build closer to the oceanfront. We would only ask that any Lauhala grove or coconut grove that has been there for a long time be somewhat preserved. Coconut groves can come in very handy when you need food, but of course the maintainance can be time consuming. It is our hope that all will be done in a correct and culturally sensitive way, to which we know you will. This is our mana'o (thought). We give our blessing along with the Kupuna of the past. May God bless you and your aina and may our Kupuna watch over you also. Please make their resting place beautiful as well . We cannot wait to see it when the time comes.

Sincerely Yours, The Lui Ohana

MahaloAloha, we plan to clear the area around the lower burial site and actually have the driveway go around it (it's a large area) We will encircle it with ti and remove the rubbish trees to stop any further damage to the area. This will make it so you can visit this area wether or not we are there or not. The upper grave area is easier walking (much flatter) and that area will be left untouched. I'll send photos as we progress, we will also do a blessing of the site before we begin and of course we would want someone from your family to be there. Thank you again for your support. Maureen

On Sat, Nov 5, 2011 at 11:11 PM, Nicole Lui <nicolelui38@yahoo.com> wrote:
glad to help Maureen hope all goes well. I had one question, in the future will we be able to actually visit the burials like without having to worry about getting hurt. I mean I am not asking that you make special pathways or anything just a little safer. It will probably be just me who will come and visit. My parents are getting on in years and it not like we will be there next week so I just thought I put my thought out there. Mahalo Nicole and yes keep me informed please.

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

September 25, 2008

Robert B. Rechtman, Ph.D.
Rechtman Consulting, LLC
HC 1 Box 4149
Keaau, HI 96749-9710

LOG NO: 2008.4261
DOC NO: 0809MD84
Archaeology

Dear Dr. Rechtman:

SUBJECT: Chapter 6E-42 Historic Preservation Review –
Archaeological Inventory Survey of a 5.586-acre parcel with nine (9) new sites
Maku'u Ahupua'a, Puna District, Island of Hawai'i
TMK: (3) 1-5-010:032

This letter reviews the aforementioned report which we received on September 23, 2008 (*Clark, Ketner and Rechtman 2008; An Archaeological Inventory Survey of TMK:3-1-5-010:032, Maku'u Ahupua'a, Puna District, Island of Hawai'i; RC-0542*). Nine new sites were documented: Site 50-10-45-26658 (an historic core-filled wall); -26659 (an historic enclosure/pavement); -26660 (an historic habitation complex); -26661 (an historic modified bedrock hole); -26662, -26663 and 26664 (historic probable burials); -26665 (a Precontact probable burial); and -26666 (a Precontact/historical agricultural complex). All are considered significant under criterion "d", and we concur with this assessment. In addition, the four probable burials are also considered significant under criterion "e" and we concur with this assessment.

We concur with your recommendation that your work documenting three of the sites (50-10-45-26658, -26661 and 2666) is sufficient and no further work is required. We concur with your recommendation that two sites (-26659 and -26660) be preserved, and look forward to reviewing the preservation plan for them. We also look forward to reviewing a burial treatment plan for the four probable burial sites (-26662, -26663, -26664 and -26665).

We accept this archaeological inventory survey as final pursuant to HAR § 13-276. Upon receipt of this letter please submit one paper copy of your report marked "Final" to our Kapolei office along with a CD containing a pdf version of the final report and a copy of this approval letter, marked to the attention of the "Kapolei Library." Please contact Morgan Davis at (808) 981-2979 if you have any questions or concerns regarding this letter.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
and Historic Preservation Manager
State Historic Preservation Division

Pod: 1010

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

May 5, 2009

Robert Spear, Ph.D.
Scientific Consulting Services, Inc.
711 Kapiolani Blvd., Suite 975
Honolulu, Hawaii 96813

LOG NO: 2009.1462
DOC NO: 0905MD02
Archaeology

Dear Dr. Spear:

SUBJECT: Chapter 6E-42 Historic Preservation Review –
Draft Preservation Plan for a Historic Habitation Enclosure
Maku`u Ahupua`a, Puna District, Island of Hawai`i
TMK: (3) 1-5-010:032 (por.)

This letter reviews the aforementioned plan, which we received on April 23, 2009 (*Pestana, Dagher and Spear 2009; A Preservation Plan for Site 50-10-45-26660 Located on a 5.59 Acre Parcel in Maku`u Ahupua`a, Puna District, Island of Hawaii [TMK (3) 1-5-010:032]; SCS Project Number 1010-PP-2*). This preservation plan follows an archaeological inventory survey (*Clark, Ketner and Rechtman 2008*) accepted by SHPD in September 2008 (*Log No. 2008.4261, 0809MD84*). A separate burial treatment plan has been prepared and submitted to our Culture and History Branch for review for this same parcel but will be reviewed separately.

Site 50-10-45-26660 is a multi-feature Historic period habitation site which will be permanently preserved with a 20-foot buffer. We approve this recommended treatment. Preservation will be by conservation, not interpretation. Interim protection will include orange construction fencing placed at the outside edge of the approved 20-foot buffer. Permanent protection will include landscape plantings and/or a wall/fence, placed at the edge of the 20-foot buffer. Only hand-held machinery may be used during any work in this 20' buffer. Should construction occur after installation of permanent protection measures, orange construction fencing is to be placed along the outer edge of the fence/wall/landscaping. Any construction utilizing non-handheld machinery during initial ground-altering activities is subject to on-site monitoring by a qualified archaeologist, including a pre-construction meeting. This will be a requirement under the burial treatment plan once it is approved, and may occur at the same time as any other monitoring/meeting required pursuant to it.

This plan is accepted as final pursuant to HAR §13-277. Upon receipt of this letter please submit one paper copy of your report marked "Final" to our Kapolei office along with a CD containing a searchable pdf version of the final report and a copy of this approval letter, marked to the attention of the "**Kapolei Library**."

If you have questions about this letter please contact Morgan Davis of our Hawaii Island Section at (808) 933-7650.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
and Historic Preservation Manager
State Historic Preservation Division

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

December 17, 2009

Robert L. Spear, Ph. D.
Scientific Consultant Services, Inc.
711 Kapiolani Blvd., Suite 975
Honolulu, Hawaii 96813

LOG NO: 2009.4225
DOC NO: 0912AJ29

Dear Dr. Spear:

Subject: **Chapter 6E-43 Historic Preservation Review –**
Burial Treatment Plan - Four Burial Sites (SIHP Sites 26662, 26663, 26664, and 26665)
Ahupua'a of Makuu, Puna District, Island of Hawai'i
TMK (3) 1-5-010: 032

Thank you for the opportunity to review the Final Burial Treatment Plan (BTP) for the four burial features located on the subject 5.59-acre parcel and entitled, *Burial Site Component of a Preservation Plan for Sites 50-10-45-26659, -26662, -26663, -26664, and -26665 Located on a 5.59-Acre Parcel in Makuu Ahupuaa, Puna District Island of Hawaii [TMK: (3) 1-5-010:032]*, Robert L. Spear, Ph.D., et al., Final November 30, 2009.

Pursuant to Hawai'i Administrative Rules (HAR) 13-300-38 the Hawai'i Island Burial Council (HIBC) voted unanimously and determined to "Preserve the burials place."

The State Historic Preservation Division (SHPD) has consulted with the applicant, the HIBC, and the known lineal and cultural descendants. The SHPD approves of the aforementioned BTP and therefore accepts the plan as final.

If you have any questions feel free to contact Analu Kameeiamoku Josephides, Cultural Historian at 808-933-7652.

Sincerely,

Phyllis Coochie Cayan

Phyllis Coochie Cayan
History and Culture Branch Chief

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ENVIRONMENTAL ASSESSMENT

GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

APPENDIX 1b
Comments to Draft EA and Responses

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NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

CDUA: HA-3626
Acceptance Date: May 18, 2012
180-Day Exp. Date: November 14, 2012

Sidney Fuke
Planning Consultant
100 Pauahi St. Suite 212
Hilo, HI 96720

JUL 12 2012

SUBJECT: Conservation District Use Application (CDUA) HA-3626 for a Single Family Residence and Related Improvements Located at Maku`u, Puna, County of Hawaii, TMK: (3) 1-5-010:032

Dear Mr. Fuke:

This letter is regarding the processing of CDUA HA-3626. The public and agency comment period on this application has closed (July 9, 2012). Attached to this letter are copies of the comments received by the Office of Conservation and Coastal Lands (OCCL) regarding the CDUA. Please send copies of your responses to the questions raised in these letters directly to the authoring agency as well as to the OCCL. Should you have received comments directly, please include a copy of the comments and your response to the OCCL also. The final copy of this project's Environmental Assessment (EA) needs to include your responses to the queries raised in these letters. These responses can be attached to the end of the Final EA document.

As previously stated, the proposed detached cabana with kitchen facilities is not consistent with Chapter 13-5, Exhibit 4 Single Family Residential Standards: August 12, 2012, Compatibility Provisions-All structures connected or best alternative. Residential uses approved by the Board must comply with Exhibit 4. Please review §13-5-41 and Exhibit 4, HAR. Your client may wish to re-site or delete this improvement.

In addition, as noted in the Acceptance letter, the rockwalls, pool catchment basin, and landscaping needs to be described in more detail. Are the walls decorative, for privacy or for erosion control? What is the native vegetation to be incorporated into the project? Please submit a descriptive topographical map of the Conservation portion of the property discussing the 4-foot drop and siting of the pool and basin. Regarding the proposed pool, please discuss sanitation and maintenance. How will the pool wastewater be handled?

In addition, please submit legible plans for the residence with dimensions specifically **Figure 3** in the CDUA. It is unclear from the plans where the 3rd bedroom and 3rd bathroom are sited. Please site the water catchment system.

Regarding the siting of the residence in the Conservation District versus the Agricultural District, there appears to be ample space to site a residence within the Agricultural District while still maintaining preserved areas. The Agricultural/Conservation District boundary was established to preserve the scenic coastline. Within the Environmental Assessment, siting the residence in the Agricultural District should be discussed under Alternatives.

These issues must be addressed in the Final Environmental Assessment for the OCCL to make a determination in regards to declaring a Finding of No Significant Impact.

The OCCL has previously informed you of a subdivision involving Conservation District land authorized by the County of Hawaii Planning Director dated APR 16 1999. It appears that parcel 011 that was dual zoned containing both Agricultural and Conservation District land and parcel 032 that once lied solely within the Agricultural District was consolidated and then subdivided into 2 parcels containing both Agriculture and Conservation District land **(Exhibit A)**.

Our records do not indicate any authorization for subdivision at the subject location. Pursuant to the Hawaii Administrative Rules (HAR) §13-5-22, Subdivision of Conservation District land must be for a public purpose and must be approved by the Board of Land and Natural Resources. In this particular case, the County approved subdivision outcome is not an identified land use that could be applied for within the Conservation District.

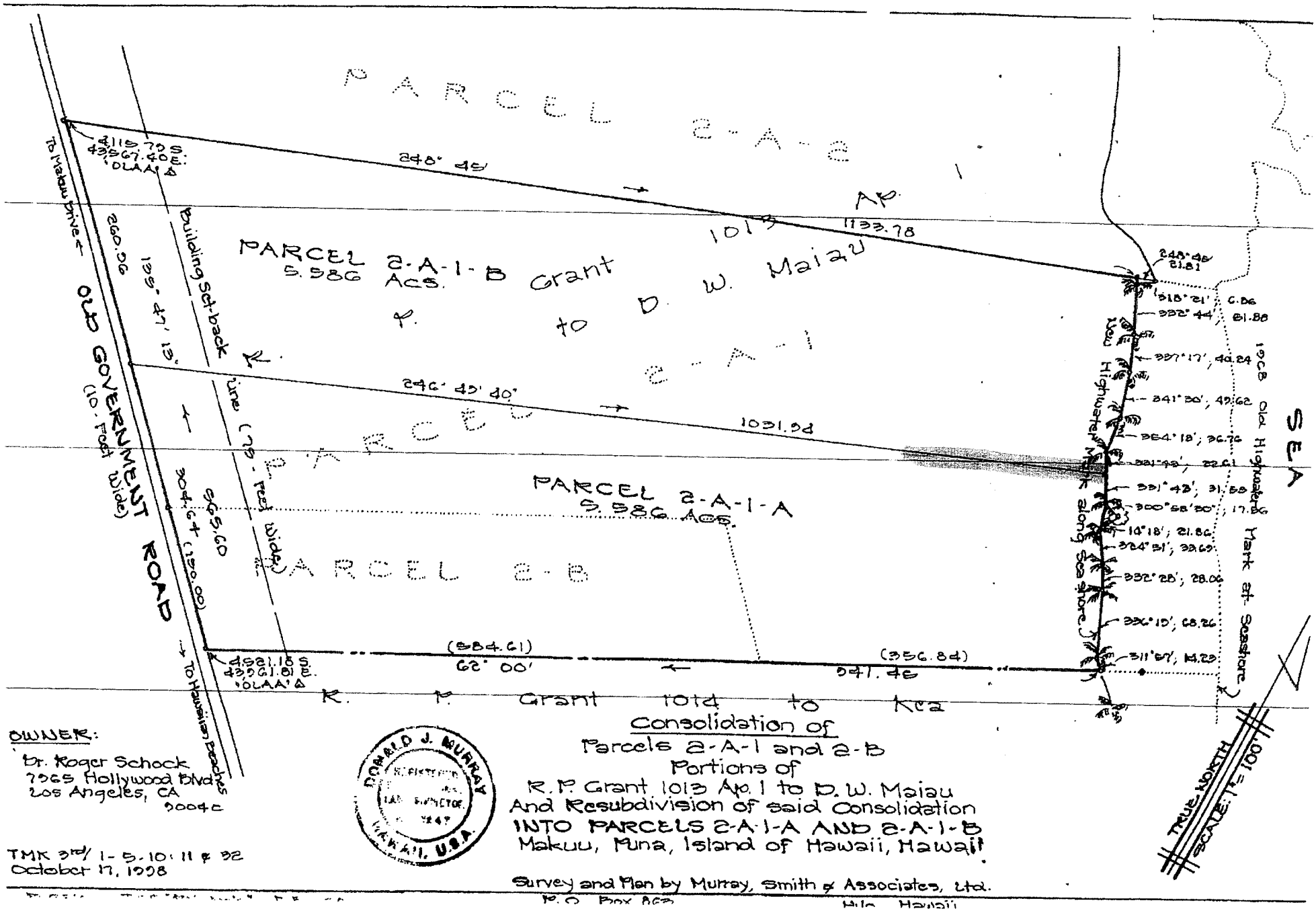
We wish to bring this to your attention as this matter may come up during the processing of your client's CDUA.

Please send 4 hard copies and 1 CD in pdf. format of your final EA to the OCCL. In addition, please send an electronic copy of the Office of Environmental Quality Control (OEQC) Publication Form to OCCL staff at kimberly.mills@hawaii.gov. If the project summary has changed, include a new summary. Please include a hard copy of the submitted publication form with the Final EAs. Should the OCCL determine a Finding of No Significant Impact (FONSI) for the final version of the Environmental Assessment, we shall forward the final EA and publication form to the OEQC.

Should you have any questions regarding matters pertaining to CDUA HA-3626, contact Tiger Mills of our Office of Conservation and Coastal Lands at (808) 587-0382.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Land



OWNER:
Dr. Roger Schock
7065 Hollywood Blvd
Los Angeles, CA
90068

TMK 3rd/ 1-5-10: 11 & 32
October 17, 1998

DONALD J. MURRAY
REGISTERED LAND SURVEYOR
HAWAII, U.S.A.

Consolidation of
Parcels 2-A-1 and 2-B
Portions of
R.P. Grant 1013 Ap. 1 to D.W. Maiau
And Resubdivision of said Consolidation
INTO PARCELS 2-A-1-A AND 2-A-1-B
Makuu, Puna, Island of Hawaii, Hawaii

Survey and Plan by Murray, Smith & Associates, Ltd.
P.O. Box 868 Hilo Hawaii

EXHIBIT A

SUBDIVISION NUMBER 7110
APPROVED FOR RECORDATION with the Bureau of Conveyances, State of Hawaii

Planning Director, County of Hawaii

Date: APR 16 1999

PLANNING DEPARTMENT
COUNTY OF HAWAII

SUB: 98 129
PPM/FPM: 10-17-98 (REV.)
RECEIVED: 4-15-99

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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AQUATIC RESOURCES
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STATE OF HAWAI`I
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAI`I 96809

REF:OCCL:TM

CDUA: HA-3626
Acceptance Date: May 18, 2012
180-Day Exp. Date: November 14, 2012
SUSPENSE DATE: 21 Days from stamped date

MAY 22 2012

MEMORANDUM

TO:

State Agencies
✓ DLNR-Resource Enforcement
____ DLNR-Engineering
____ DLNR-Hawaii District Land Office
____ DLNR-Forestry and Wildlife
____ DLNR-Historic Preservation
____ DLNR-Na Ala Hele
____ DOH-Environmental Planning Office
____ Office of Hawaiian Affairs

County Agencies:
____ Planning Department
____ Department of Public Works
____ Fire Department

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application (CDUA) HA-3626
Single Family Residence and Associated Improvements

APPLICANT: John & Maureen Gapp
TMK: (3) 1-5-010:032

LOCATION: Maku`u, Puna, County of Hawai`i
PUBLIC HEARING: No

RECEIVED
2012 MAY 25 P 1:
DOCARE
HILO, HAWAII

RECEIVED
2012 MAY 29 P 3:
DOCARE
NATURAL RESOURCES
HILO, HAWAII

Attached please find CDUA HA-3626, a CD of the Environmental Assessment and our Department's notice to the applicant. We would appreciate your agency's review and comment on this application. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

Contact Tiger Mills at (808) 587-0382 should you have any questions on this matter.

( ) Comments Attached

(X) No Comments

CRED IV

Signature/ Print your Name and Title

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2012 JUN 13 P 4: 03
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAI`I
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAI`I 96809

REF:OCCL:TM

CDUA: HA-3626
Acceptance Date: May 18, 2012
180-Day Exp. Date: November 14, 2012
SUSPENSE DATE: 21 Days from stamped date

MEMORANDUM

MAY 22 2012

'12 MAY 22 P4:58 ENGINEERING

TO:

State Agencies

_____ DLNR-Resource Enforcement
__✓__ DLNR-Engineering
_____ DLNR-Hawaii District Land Office
_____ DLNR-Forestry and Wildlife
_____ DLNR-Historic Preservation
_____ DLNR-Na Ala Hele

_____ DOH-Environmental Planning Office
_____ Office of Hawaiian Affairs

County Agencies:

_____ Planning Department
_____ Department of Public Works
_____ Fire Department

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application (CDUA) HA-3626
Single Family Residence and Associated Improvements

APPLICANT: John & Maureen Gapp
TMK: (3) 1-5-010:032

LOCATION: Maku`u, Puna, County of Hawai`i
PUBLIC HEARING: No

Attached please find CDUA HA-3626, a CD of the Environmental Assessment and our Department's notice to the applicant. We would appreciate your agency's review and comment on this application. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

Contact Tiger Mills at (808) 587-0382 should you have any questions on this matter.

(✓) Comments Attached

( ) No Comments

Signature/ Print your Name and Title
for CARTY CHANG, Chief Engineer.

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

OCCL/TigerMills
REF.:CDUA:HA-3626SFRJohn&MaureenGapp
Hawaii.562

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone____.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting..

( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

( ) he applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update

( ) Additional Comments: _____

_____

( ) Other: _____

_____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
For CARTY S. CHANG, CHIEF ENGINEER

Date: 6/8/12

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAI`I
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAI`I 96809

REF:OCCL:TM

CDUA: HA-3626
Acceptance Date: May 18, 2012
180-Day Exp. Date: November 14, 2012
SUSPENSE DATE: 21 Days from stamped date

MAY 22 2012

MEMORANDUM

TO:

State Agencies

_____ DLNR-Resource Enforcement
_____ DLNR-Engineering
✓ DLNR-Hawaii District Land Office
_____ DLNR-Forestry and Wildlife
_____ DLNR-Historic Preservation
_____ DLNR-Na Ala Hele

_____ DOH-Environmental Planning Office
_____ Office of Hawaiian Affairs

County Agencies:

_____ Planning Department
_____ Department of Public Works
_____ Fire Department

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application (CDUA) HA-3626
Single Family Residence and Associated Improvements

APPLICANT: John & Maureen Gapp
TMK: (3) 1-5-010:032

LOCATION: Maku`u, Puna, County of Hawai`i
PUBLIC HEARING: No

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2012 MAY 21 A 11: 07

RECEIVED
LAND DIVISION
HILO, HAWAII
2012 MAY 23 P 12:45

Attached please find CDUA HA-3626, a CD of the Environmental Assessment and our Department's notice to the applicant. We would appreciate your agency's review and comment on this application. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

Contact Tiger Mills at (808) 587-0382 should you have any questions on this matter.

( ) Comments Attached

(✓) No Comments

Gordon C. Hirt District Land Agent
Signature/ Print your Name and Title

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

DOH-EPO
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'12 MAY 25 A9:15

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
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HONOLULU, HAWAI'I 96809

2012 MAY 2 A 11: 09

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MEMORANDUM

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County Agencies:

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_____ Fire Department

FROM: Samuel J. Lemmo, Administrator
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Conservation District Use Application (CDUA) HA-3626
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APPLICANT: John & Maureen Gapp
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LOCATION: Maku`u, Puna, County of Hawai`i
PUBLIC HEARING: No

Attached please find CDUA HA-3626, a CD of the Environmental Assessment and our Department's notice to the applicant. We would appreciate your agency's review and comment on this application. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

Contact Tiger Mills at (808) 587-0382 should you have any questions on this matter.

( ) Comments Attached

(X) No Comments

/ Laura McIntyre, (DOH EHA) EPO Manager
Signature/ Print your Name and Title

12-099

geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

August 20, 2012

Sam Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

Subject: Comments to CDUA/Draft Environmental Assessment for Gapp Single-Family Residence in the Conservation District at Makuʻu, Puna District, Island of Hawaiʻi, TMK (3rd.) 1-5-010:032

I am in receipt of your letter to project planner Sid Fuke of July 12, 2102, containing OCCL's comments, referencing a previous submittal transmitted by Planner Kimberly Mills of your staff that contained comments from other agencies that OCCL had compiled, and providing instructions for submittal of the Final EA to your office.

In the interest of a complete record on comment letters to the EA/CDUA, I would like to acknowledge receipt of comments contained within your transmittal letter as well as form memos circulated by your office.

We acknowledge here the *no-comment* remarks of those agencies that reviewed the EA, for which no response is necessary (DOCARE, the Land Division, Hawaiʻi District Land Office, and the Department of Health, Environmental Planning Office).

The Engineering Division commented that the project site is within Flood Zone X. We appreciate the confirmation of this information contained in the Draft EA. We have copied the Engineering Division on this letter.

For the letters from the Planning Department and Fire Department, we have prepared individual responses, which are attached to this letter.

In answer to the specific comments from OCCL, we offer the following:

1. *Pavilion with kitchen facilities*. The Gapps understand your concerns but still propose to have the pavilion be detached from the main dwelling in an area convenient for their fishing. It is a simple, open pavilion to be used as a staging and storage area for gardening and recreational fishing by the owners, including throw nets, poles and tackle. A location adjacent to the home would not be as appropriate for

this element. It would not be lived in or rented. Considering the proposed function of the home, the detached pavilion is the best alternate to an all-connected design. It was never designed to have a kitchen but was to have had a deep sink for cleaning fish; the Gapps are willing to delete the sink. John Gapp desired that we include this statement from him concerning the need for the pavilion and his motivation for the home design:

> "Ancient Hawaiians drew their sustenance - physical and spiritual - from the land and sea around them. In Hawaiian culture fishing holds a central role. When I moved to Kalapana in 1978 I learned to fish and throw net in Kaimu Bay and canoe landing. The local fishermen taught me not just how fishing could feed my family but it was a way of life. Fishing gave me a spiritual relationship with the sea. It taught me about the culture of this island I had made my home.
>
> In 1990 we were all devastated by the destruction of Kalapana by Pele. Those who had taught me so much, my Kalapana ʻohana, were now left with finding new fishing grounds. Our new homes were scattered throughout the Big Island. Getting together to fish became more and more difficult.
>
> In 2002 I found a property on the ocean in the Makuʻu ahupuaʻa. This property for me replaced what we lost in Kalapana and provided an area for myself and my friends from Kalapana to get together and fish. The land is rough terrain and heavily wooded making it somewhat difficult to access for the older members of my Kalapana ohana. The property has a koʻa (fishing ground) accessible along the shoreline. Since we bought the property we have all met down there to fish. I have taught my own son the lessons I was taught and he now makes his living fishing. He has learned to respect the sea and to value the traditions we have passed on to him.
>
> Our plan is to build our home approximately 200 feet up from the shore where the property rises up (about 10 feet) and to build a fishing hale pavilion 60 feet from the shore. It will be 500 sq feet and utilized to store fishing equipment and an area to clean fish.
>
> My dream is to replace my home I lost in Kalapana and to recreate a small easily accessible area for fishing. Where my ohana and I can come together and fish and to teach our ever growing families to form a spiritual relationship with the sea and to learn the cultural values that make the Big Island so special. Those that respect the sea will protect it."

2. *Rock walls, pool catchment basin, landscaping, topography and water supply.* The Final EA contains improved, detailed Site Plans that clearly indicate the location and function of landscape elements. The saltwater pool basin overflow/waste water will go to an aerobic septic system. To make the property, most of which is covered densely with non-native vegetation, a more hospitable place to live, the Gapps wish to remove the invasive plants in the conservation area and replace them with native, Polynesian and 19th century period trees, with a focus on plants that provide a sustainable resource like mango, ulu, and bananas. They will also preserve most of the existing lauhala, coconuts and naupaka. Removing the dense invasive plants will leave the area open to sea breezes and light, which will decrease the heavy mosquito population. This information has been added to the Final EA.

Concerning the topography, the lot has a generally low slope, with a rise of only about 40 feet over 1,000 feet from the ocean to the road. The topography is hummocky. The area for the home is situated at about 25 feet above sea level, and there is a low pali on the makai side that where the topography

steps down to an elevation of about 10-15 feet above sea level. This is now indicated on the Site Plan. There is no problem with erosion or slope stability on the property, and the walls are not for these functions, but merely to mark the edge of the low dropoff for safety reasons and provide a decorative element to the yard.

The owners have determined that they will utilize a water well for water supply, as do many residents in this area. The approximate location for the well is now marked on the Site Plan. The well will be permitted through appropriate government agencies. This information has been added to the Final EA.

3. *Legible plans and location of 3rd bedroom and bathroom*. A new floor plan has been developed that clearly indicates the location of all features. There will be only two bathrooms, a change which has been noted in the Final EA.

4. *Siting of residence in Agricultural District.* The home is sited in the only appropriate location on the property, as the agricultural district contains a number of burial sites and a significant and unique archaeological site (the 19th century school remnants) that require preservation with buffers.

It should be noted that when the applicants originally envisioned a home on the property prior to detailed investigation of site conditions, they **did** site it within the Agricultural District. The applied for a Special Management Area permit and consulted the State Historic Preservation Division, which failed to respond to the Planning Department within the allotted time, and the SMA was granted. As the applicants began site preparation in 2007, they noted archaeological sites and immediately ceased work and consulted Dawn Hegger of your office, who instructed them to conduct an archaeological inventory survey, for which they contracted a professional archaeologist. The Gapps have diligently prepared all plans recommended by the archaeologist, including preservation plans and a burial treatment plan (during which they worked with the lineal descendants), which have been fully accepted. The original planned building site turned out to have the largest of the two grave sites. The area between the school site and the grave sites contains numerous old walls and agricultural pens and has many deep fissures. It is not feasible to build between the school site and the first burial site as this area is a large fissure. The school site provides a valuable resource for the local schools to visit and explore, which the applicants wish to make available in an undisturbed context. The identified lineal descendant for the property, Nicole Lui, visited the site and requested that the Gapps make the grave sites more accessible for their visits, as documented in the Draft EA. Accordingly, the driveway was designed to pass around one site, as proposed in the burial preservation plan, making both sites accessible to the family. Only the proposed location in the Conservation District, on the site of a former residence, satisfies archaeological and cultural concerns. This explanation for the location of the home will be added to the discussion of alternatives that were considered but rejected because of adverse environmental impact. Please note that the home as designed will have *no effect* on views to, from or along the coast.

5. *Subdivision never approved by DLNR*. The subdivision was done in 199 by other parties and approved by the County of Hawai‘i prior to the Gapps’ purchase of the property in 2002. The Gapps bought the property unaware of the alleged defect in the subdivision process, and they have been paying taxes on the property for ten years. They have applied for and received approval for construction of a home on the property at several times and were never informed of a problem. The Gapps have no ability to rectify the matter.

Thank you for circulating the EA and CDUA for review by DLNR and other agencies. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project or CDUA, please contact Sid Fuke, Project Planner, at (808) 969-1522.

Sincerely,

Ron Terry

Ron Terry, Principal
Geometrician Associates

Cc: Sam Lemmo, DLNR-OCCL
Sid Fuke, Project Planner
Engineering Division (no attachments)

William P. Kenoi
Mayor

BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

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

County of Hawai'i

PLANNING DEPARTMENT

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

June 12, 2012

Mr. Samuel J. Lemmo
Administrator
Office of Conservation and Coastal Land
Department of Land and Natural Resources
State of Hawai'i
P. O. Box 621
Honolulu, HI 96809

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2012 JUN 11 A 11: 17
DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Dear Mr. Lemmo:

SUBJECT: Conservation District Use Permit Application
Applicant: John & Maureen Gapp
Project: Single Family Residence and Associated Improvements
TMK: (3) 1-5-010:032; Portion of Maku'u and Keonepoko Nui, Puna, Hawai'i

This is in response to your request for comments on the above referenced application. We have reviewed the subject Conservation District Use Application (HA-3626) for a single family residence and associated improvements on the subject property.

The subject parcel consists of 5.586 acres and are zoned A-1a (Agricultural- minimum one acre lot size). The parcel is located in the State Land Use Agricultural and Conservation Districts and designated as Extensive Agricultural and Open by the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map. In addition, the subject parcel is located entirely within the Special Management Area (SMA) with frontage along the shoreline.

Special Management Area Determination:
A Special Management Area Use Permit Assessment Application (SAA-12-000794) was submitted for our review on April 16, 2012. According to Chapter 205A-22, HRS and Planning Commission Rule 9 relating to Special Management Area, "development" does not include *"Construction or reconstruction of a single-family residence that is less than seven thousand five hundred square feet of floor area and is not part of a larger*

development." Therefore, the construction of the 5,000 square-foot single-family dwelling and related improvements may be exempt from the definition of "development".

However, because the project location appears to be located in the State Land Use Conservation District, prior to the processing of the SMA determination, compliance with Hawai'i Revised Statutes, Chapter 343 Environmental Impact Statements must be satisfied.

The Draft Environmental Assessment was posted in the June 8, 2012 Department of Health, Office of Environmental Quality Control, Environmental Notice. The comment period will end on July 9, 2012. We understand that your Department has found that a finding of no significant impact to the environment (FONSI) is anticipated for the proposed project.

Therefore, with the compliance of HRS Chapter 343, we will continue processing our SMA determination and forward it to your office. We have no further comments to offer at this time. If you have any questions, please feel free to contact Bethany Morrison of our office at (808) 961-8138.

Sincerely,

for BJ LEITHEAD TODD
Planning Director

BJM:bjm
P:\wpwin60\Bethany\General Zoning Inquiries\CDUA John ad Maureen Gapp- Lilikoi Trust.doc

xc: Mr. Sidney M. Fuke
100 Pauahi Street, Suite 212
Hilo, HI 96720

geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

August 20, 2012

Bobby Jean Leithead-Todd, Director
Hawai`i County Planning Dept.
101 Pauahi Street, Suite 3
Hilo HI 96720

Dear Ms. Leithead-Todd:

Subject: Comments to CDUA/Draft Environmental Assessment for Gapp Single-Family Residence in the Conservation District at Maku‘u, Puna District, Island of Hawai‘i, TMK (3rd.) 1-5-010:032

Thank you for your comment letter dated June 12, 2012, on the Draft EA. In answer to your specific comments:

1. *Land use designations*. Thank you for confirming the land use designation information contained in the EA.

2. *SMA*. Thank you for providing Mr. Lemmo with the information on the status of the SMA.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,

Ron Terry, Principal
Geometrician Associates

Cc: Sam Lemmo, DLNR-OCCL
Sid Fuke, Project Planner

William P. Kenoi
Mayor

Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

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

May 29, 2012

Mr. Samuel J. Lemmo
State of Hawai'i - Department of Land and Natural Resources
Office of Conservation and Coastal Lands
PO Box 621
Honolulu, Hawai'i 967809

SUBJECT: CONSERVATION DISTRICT USE APPLICATION (CDUA) HA-3626
SINGLE FAMILY RESIDENCE & ASSOCIATED IMPROVEMENTS
APPLICANT: JOHN & MAUREEN GAPP
TMK: (3) 1-5-010:032

In regards to the above-mentioned Conservation District Use Application, the following shall be in accordance:

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

Chapter 18 Fire Department Access and Water Supply

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

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

18.1.1 Plans.

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

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

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

18.2 Fire Department Access.

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

18.2.2* Access to Structures or Areas.

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

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

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

18.2.3 Fire Department Access Roads.

18.2.3.1 Required Access.

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

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

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

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

18.2.3.2 Access to Building.

18.2.3.2.1 A fire department access road shall extend to within in 50 ft (15 m) of at least one exterior door that can be opened from the outside and that provided access to the interior of the building.

18.2.3.2.1.1 When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.2 shall be permitted to be increased to 300 feet.

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

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

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

18.2.3.4 Specifications.

18.2.3.4.1 Dimensions.

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

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

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

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

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

18.2.3.4.3 Turning Radius.

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

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

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

18.2.3.4.5 Bridges.

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

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

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

18.2.3.4.6 Grade.

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

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

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

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

18.2.3.5 Marking of Fire Apparatus Access Road.

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

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

18.2.4* Obstruction and Control of Fire Department Access Road.

18.2.4.1 General.

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

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

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

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

18.2.4.2 Closure of Accessways.

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

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

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

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

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

18.3 Water Supplies and Fire Hydrants

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

EXCEPTIONS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

EXCEPTIONS TO SECTION 18.3.8:

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

(2) Buildings less than 800 square feet in size that meets the minimum Fire Department Access Road requirements.
(3) For one and two family dwellings, agricultural buildings, storage sheds, and detached garages 800 to 2000 square feet in size, and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 1000 feet.
(4) For one and two family dwellings, agricultural buildings, and storage sheds greater than 2000square feet, but less than 3000 square feet and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 500 feet.
(5) For buildings with an approved automatic sprinkler system, the minimum water supply required may be modified.

If there are any questions regarding these requirements, please contact the Fire Prevention Bureau at (808) 932-2912.

DARREN J. ROSARIO
Fire Chief

KT/lc

geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

August 20, 2012

Darren J. Rosario, Chief
Hawai‘i Fire Department
25 Aupuni Street, Room 2501
Hilo HI 96720

Dear Chief Rosario:

Subject: Comments to CDUA/Draft Environmental Assessment for Gapp Single-Family Residence in the Conservation District at Maku‘u, Puna District, Island of Hawai‘i, TMK (3rd.) 1-5-010:032

Thank you for the comment letter dated May 29, 2012, providing information regarding the NFPA Uniform Fire Code. The applicant will conform with all applicable regulations related to single-family residences.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,

Ron Terry

Ron Terry, Principal
Geometrician Associates

Cc: Sam Lemmo, DLNR-OCCL
Sid Fuke, Project Planner

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

PAUL J. CONRY
INTERIM FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

REF:OCCL:TM

CDUA: HA-3626
Acceptance Date: May 18, 2012
180-Day Exp. Date: November 14, 2012

Sidney Fuke
Planning Consultant
100 Pauahi St. Suite 212
Hilo, HI 96720

AUG 2 9 2012

SUBJECT: Final Environmental Assessment (EA) for Conservation District Use Application (CDUA) HA-3626 for a Single Family Residence and Related Improvements Located at Maku`u, Puna, County of Hawaii, TMK: (3) 1-5-010:032

Dear Mr. Fuke:

The Office of Conservation and Coastal Lands (OCCL) has reviewed the proposed Final Environmental Assessment and note that our comments were not adequately addressed in the document. Therefore it appears that we cannot issue a Finding of No Significant Impact (FONSI).

The OCCL requested that other **alternatives** be explored such as siting the residence in the Agricultural District. The response to our Office was, *"The home is sited in the only appropriate location in the property, as the agricultural district contains a number of burials sites and a significant and unique archaeological site that require preservation with buffers."*

Attached is the proposed development plan from the Cultural Impact Assessment **(Exhibit A)**. As previously stated, there appears to be ample room to site improvements in the Agricultural District. Your client may wish to consider reducing the size of development to reduce the imposition on the preservation areas. Please present alternatives other than no action in the final EA.

The OCCL requested a discussion of sanitation and maintenance of the pool and asked how the pool wastewater would be handled. The response was: *The saltwater pool basin overflow/waste water will go to an aerobic septic system.* The word saltwater was added to section **1.1 Project Description and Location** of the final EA but the document does not contain any discussion regarding pool maintenance. While an aerobic septic system is sited on the lot, an Individual Wastewater System is not sited. The two types of generated wastewater should not be comingled as salt is corrosive and may interfere with the delicate balance of bacteria and waste. Address pool maintenance and wastewater handling in more detail.

In regards to the Fire Department comments, as there does not appear to be any connection to County water, please include discussion of how the proposal will comply with the Fire Department's minimum of 12,000 gallons of water available for firefighting. Include the siting of improvements as necessary.

Regarding the newly proposed water well in the final EA, please consult with the Commission of Water Resource Management (CWRM) concerning this new proposal.

Regarding the detached pavilion, no proposal to attach the pavilion or to delete the use to comply with the Hawaii Administrative Rules (HAR), Chapter 13-5 Single Family Residential Standards, were included.

The lack of the subdivision approval is of a foremost concern. The subdivision would not have been permitted under our administrative rules. Subdivision of land that may increase density and does not serve a public purpose is inconsistent with the Conservation District. While the OCCL agrees there does not appear to be any method to rectify this situation, the fact remains that the subdivision is unauthorized and a major issue in this case.

Your client should seriously consider locating the structure in the agricultural portion of the property. However should you wish to proceed with this matter, the final Environmental Assessment must be improved and our concerns must be addressed in more detail within the document, for the OCCL to continue processing the EA, time permitting. Please arrange to have the proposed final EAs picked up at our Office within 30 days or we shall recycle the documents. Should you have any questions regarding this correspondence contact Tiger Mills of our Office at (808) 587-0382.

Sincerely,

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

C: Chairperson
OEQC
County of Hawaii, Planning Dept.

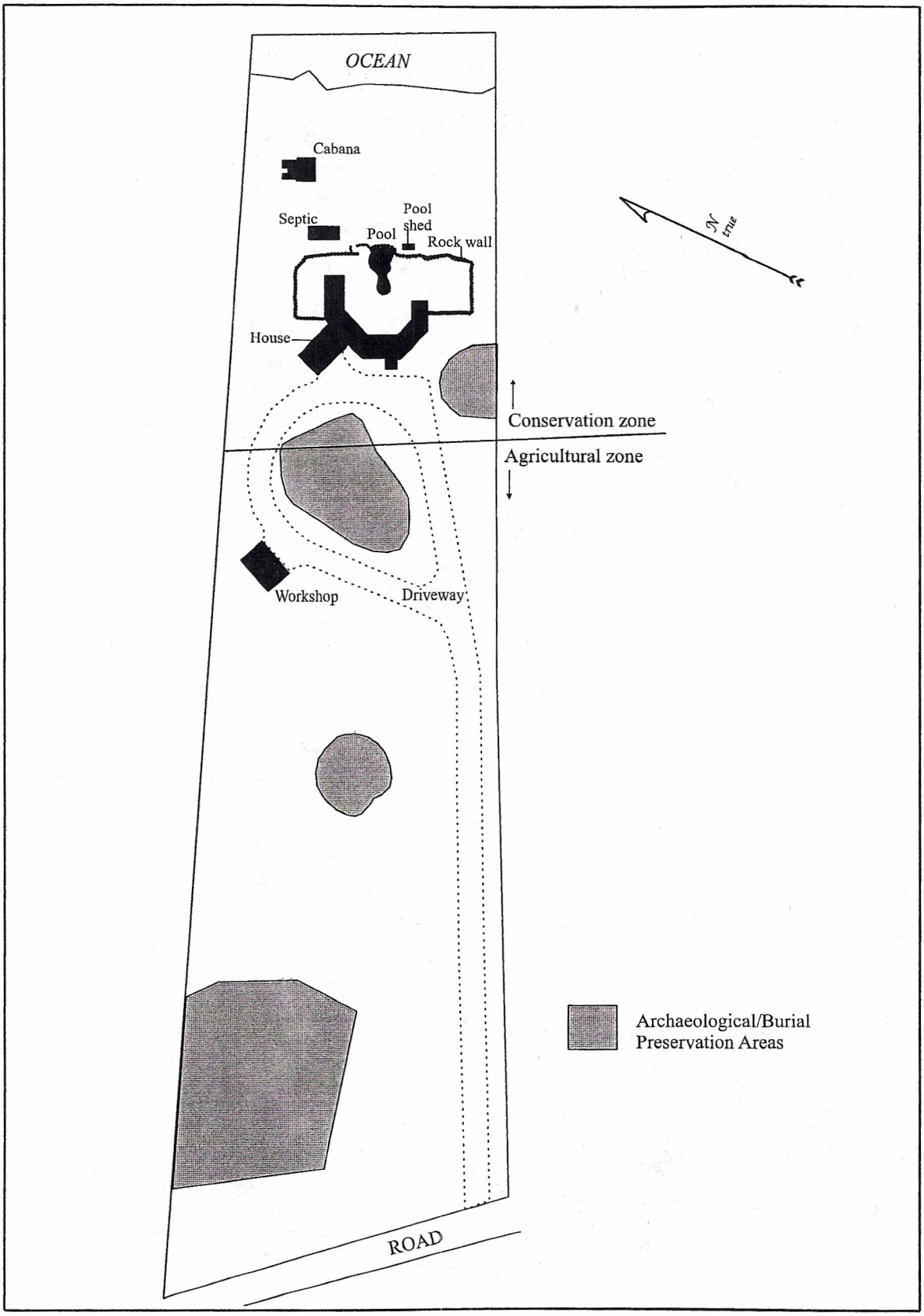


Figure 5. Proposed development plan.

EXHIBIT A

geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

September 12, 2012

Sam Lemmo, Administrator
And Kimberly Mills, Planner
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809
Via email:

Subject: DLNR Review of Applicant's Final Environmental Assessment for Gapp Single-Family Residence in the Conservation District at Makuʻu, Puna District, Island of Hawaiʻi, TMK (3rd.) 1-5-010:032

Dear Mr. Lemmo and Ms. Mills:

This letter is to respond to your August 29, 2012 letter to project planner Sid Fuke on the Final EA. We note your request to 1) revise the project by altering certain aspects that your office feels violated Conservation District standards or created significant environmental impacts, and 2) to revise the EA by providing more specifics on aspects of the project and their environmental impacts.

First of all, we are informing you that the applicants, John and Maureen Gapp, have revised the project by removing the cabana/pavilion, which your office contends does not conform to the standard of all structures connected or best alternative. The applicants have carefully considered your argument and consulted with cultural experts and the lineal descendant regarding relocating the home within the Agricultural District portion of the property, and have determined that this location would generate greater cultural impacts and is imprudent.

The main body of the revised Final EA has been included as an attachment to this message, along with several pertinent letters that are intended to be included in Appendix 1b. **We would kindly request that you please accept the digital copy of this letter and the EA for review rather than requiring us to submit three bound copies by mail, as time is getting to be of the essence and we have the burden of being on an outer island.** The changes from the Draft EA to the original Final EA (which your office rejected) are denoted in blue double-underlines. New text to address your concerns is denoted in green font double-underlines. Both colors will be removed upon printing, leaving the double underlines to guide the reader as to non-procedural changes from Draft to Final EA.

In order to facilitate and expedite your review, we offer the following to demonstrate how the revised Final EA has responded to your concerns:

1. "The OCCL requested that other alternatives be explored such as siting the residence in the Agricultural District. The response to our Office was, *"The home is sited in the only appropriate location in the property, as the agricultural district contains a number of burials sites and a significant and unique archaeological site that require preservation with buffers."* Attached is the proposed development plan from the Cultural Impact Assessment (Exhibit A). As previously stated, there appears to be ample room to site improvements in the Agricultural District. Your client may wish to consider reducing the size of development to reduce the imposition on the preservation areas. Please present alternatives other than no action in the final EA.

The revised FEA includes a statement from an archaeologist (please see attached letter) noting that having a dwelling situated within the Agricultural District area would not be prudent, given the burials and cultural remains in that area.

Dr. Robert Rechtman, the cultural resource specialist who prepared the Archaeological Inventory Survey and Cultural Impact Assessment for the Environmental Assessment, was asked to comment on the suggestion by OCCL to move the proposed home to the Agricultural District. Dr. Rechtman's letter is contained at the end of Appendix 1b. He notes in the letter that:

> "…there are three large Archaeological/Burial preservation areas containing five sites (SIHP Sites 26659, 26660, 26662, 26663, and 26664) within the Agricultural District portion of the parcel. A small portion of one of these preservation areas extends into the Conservation District portion of the parcel where there is one additional preservation area containing one site (SIHP Site 26665).
>
> The current proposed location of the house is shoreward of all of the preservation areas, which form a "zone of preservation" occupying roughly the mauka 3/4 of the parcel. The current proposed location of the residence was taken into consideration when assessing cultural impacts, and while I did not prepare the Archaeological Preservation Plan or the Burial Treatment Plan, I would assume that the current proposed location was also a consideration during those planning processes. If the proposed residence is to be relocated, then a reassessment of impacts and a reconsideration of preservation buffer sizes will have to be conducted. The current location "beyond" the zone of preservation sites does not present an intrusive visual presence, which might not be the case if the residence was to be placed "within" the zone of preservation sites. As can be seen on the attached figure, and keeping the same configuration, the proposed residence will fit between preservation areas, but given the drastic "up and down" nature of the lava substrate in this area, substantial alteration of the natural terrain and vegetation (grubbing and grading) will have to occur, which will clearly impact the existing natural feel of the zone of the preservation sites.

> I am not sure what justification OCCL offered for the suggested relocation, but in my professional opinion, given the archaeological/cultural resources present on the parcel, the most strategic in terms of historic preservation and the most culturally sensitive location for a single family residence on the parcel is in the area shoreward of the zone of preservation sites."

Another important consideration is previous disturbance on the property. The EA now contains this statement:

> It is also important to note that the Conservation District area previously contained a small house for an unknown number of decades and then as a campsite on and off for at least 10 years, as the site is near a tidepool area popular with picnickers and fishermen. After the applicants purchased the property they were obliged to haul away many tons of garbage and wreckage from the old house site (see Figure 3 for area). The relatively pristine part of the property is actually within the Agricultural District.

2. "The OCCL requested a discussion of sanitation and maintenance of the pool and asked how the pool wastewater would be handled. The response was: *The saltwater pool basin overflow/waste water will go to an aerobic septic system.* The word saltwater was added to section 1.1 Project Description and Location of the final EA but the document does not contain any discussion regarding pool maintenance……. The two types of generated wastewater should not be comingled as salt is corrosive and may interfere with the delicate balance of bacteria and waste. Address pool maintenance and wastewater handling in more detail."

We regret the misstatement about the pool water. We have added a discussion of pool water, referencing a letter from Atlas Engineering, which was consulted about the project (please see attached letter).

The saltwater pool will need occasional partial or full draining as part of maintenance, which will be accommodated, in accordance with all regulations, in a landscaped area near the home (see Figure 3), with all surface water kept on the lot, preventing any effects to water quality or neighboring property (see letter from Atlas Engineering at end of Appendix 1b). No other aspect of pool maintenance will have any environmental effects.

3. "While an aerobic septic system is sited on the lot, an Individual Wastewater System is not sited."

An aerobic septic system IS an Individual Wastewater System.

4. "In regards to the Fire Department comments, as there does not appear to be any connection to County water, please include discussion of how the proposal will comply with the Fire Department's minimum of 12,000 gallons of water available

for firefighting. Include the siting of improvements as necessary. Regarding the newly proposed water well in the final EA, please consult with the Commission of Water Resource Management (CWRM) concerning this new proposal."

The EA now states that the well will require permits from the Commission on Water Resources Management. There are many wells in the area and there are no issues with sustainable yield or contamination, and there is no requirement for a prospective well owner to "pre-consult" with CWRM. If a well is for any reason unsuitable, the applicant will simply utilize roof catchment, as most residents in Puna do. A 12,000-gallon water tank has been added, included on the Site Plan, and the following text has been added to the Final EA:

In a comment letter to the Draft EA, the Fire Department provided applicable standards from the Fire Code (see Appendix 1b). Many of the standards related to commercial buildings in urban areas with access to municipal water supplies. For single-family homes in the rural Puna District, where municipal water systems are very limited, the standards at 18.3.8, including sections (1)-(3) and (5)-(6) apply, dealing with minimum tank size, pipe sizes, tank and valve construction and location, and inspection and maintenance. The applicant will provide a minimum 12,000-gallon water tank devoted expressly for firefighting purposes. It should be noted that when water variances to allow the use of water catchment system are issued by the County of Hawai'i Planning Department, the Department – based on input from the Water and Fire Departments – require a minimum 9,000 gallon water storage system, 6,000 gallons of which would be for potable purposes and the remaining 3,000 for firefighting and emergency purposes. Further, the location and capacity of the emergency water system, including the necessary compatible connector system, has to meet with the approval of the Hawai'i County Fire Department. The applicant will abide by these standards.

5. "The lack of the subdivision approval is of a foremost concern. The subdivision would not have been permitted under our administrative rules. Subdivision of land that may increase density and does not serve a public purpose is inconsistent with the Conservation District. While the OCCL agrees there does not appear to be any method to rectify this situation, the fact remains that the subdivision is unauthorized and a major issue in this case."

The applicants cannot speak to the reason(s) why the County Planning Department approved an application in 1999 to consolidate two lots and resubdivide them into two lots resulting in the current configuration, one of which was purchased by the applicants. We would note that when OCCL cited the applicants for a violation resulting from their removal of tons of trash from the old homesite and illegal camping predating their acquisition, and in OCCL communications related to an SMA application related to the lot, neither OCCL nor any other government entity informed the applicants then that their lot was created without the necessary approval of the BLNR. The applicants are an innocent party to this situation and cannot by themselves remedy this situation, short of potentially initiating costly and time-consuming litigation that will affect a number of property owners, the County, and the State. The applicants thus respectfully request that your office and the BLNR take that into consideration as you deliberate on their application.

Please call me at 969-7090 if you have any questions or concerns. We look forward to your review and response.

Sincerely,

Ron Terry, Principal
Geometrician Associates

Cc: Sam Lemmo, DLNR-OCCL
Sid Fuke, Project Planner
John and Maureen Gapp

ATLAS ENGINEERING, LLC
◘ Professional Civil Engineering Services ◘

September 10, 2012

Subject: Final Environmental Assessment
HA-3626
TMK: (3) 1-5-010: 032

First of all, it should be noted that there are only very few times that one needs to ever fully drain a swimming pool, as the soil water under the pool creates an upward hydrostatic force (through buoyancy) and the pool is lifted out of the ground.

There are no federal, County of Hawaii or State of Hawaii regulations that prohibit the draining of residential swimming pool water onto a landscaped area as long as the surface water does not leave the property. The County of Hawaii has regulations regarding release to a sanitary sewer.

Section 21-8. Drainage of storm water and unpolluted water into sewers.

"No person shall discharge or cause to be discharged, directly or indirectly, any storm water, surface water, ground water, roof runoff, subsurface drainage, cooling water, swimming pool water or other unpolluted drainage into any public sewer."
(1975 C.C., c. 14, art. 1, sec. 4.01.)

I recommend that when the pool is emptied, the water be pumped and discharged on the ground at an area approximately 175' from the shoreline and 25' above sea level. In my opinion, there will be no adverse impact to the environment should the pool water be disposed in this way.

Paul A. Nash, P.E.
C-7469

P.O. Box 11188 ◘ Hilo, HI 96721
(808) 965-7350 ◘ FAX: 965-9531
◘ E-mail: zp_nash@yahoo.com ◘

RECHTMAN CONSULTING, LLC
507-A E. Lanikaula St. Hilo, Hawaii 96720
phone: (808) 969-6066 fax: (808) 443-0065
e-mail: bob@rechtmanconsulting.com
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

RC-0723

September 10, 2012

John and Maureen Gapp
P.O. Box 1128
Pāhoa, HI 96778

RE: The possible relocation of a proposed single-family residence on TMK 3-1-5-010:032, Makuʻu Ahupuaʻa, Puna District, Island of Hawaiʻi

Dear John and Maureen:

It has been brought to my attention that the Department of Land and Natural Resources-Office of Conservation and Coastal L ands (OCCL) has suggested that you relocate your proposed single-family residence out of the Conservation District portion of your parcel and into the Agricultural District portion of your parcel (TMK 3-1-5-010:032). I am basing the following comments on my familiarity with the parcel and the archaeological/cultural resources thereon, having prepared the Archaeological Inventory Survey and Cultural Impact Assessment for the Environmental Assessment that accompanied the Conservation District Use Application for this parcel. As you are aware, there are three large Archaeological/Burial preservation areas containing five sites (SIHP Sites 26659, 26660, 26662, 26663, and 26664) within the Agricultural District portion of the parcel. A small portion of one of these preservation areas extends into the Conservation District portion of the parcel where there is one additional preservation area containing one site (SIHP Site 26665).

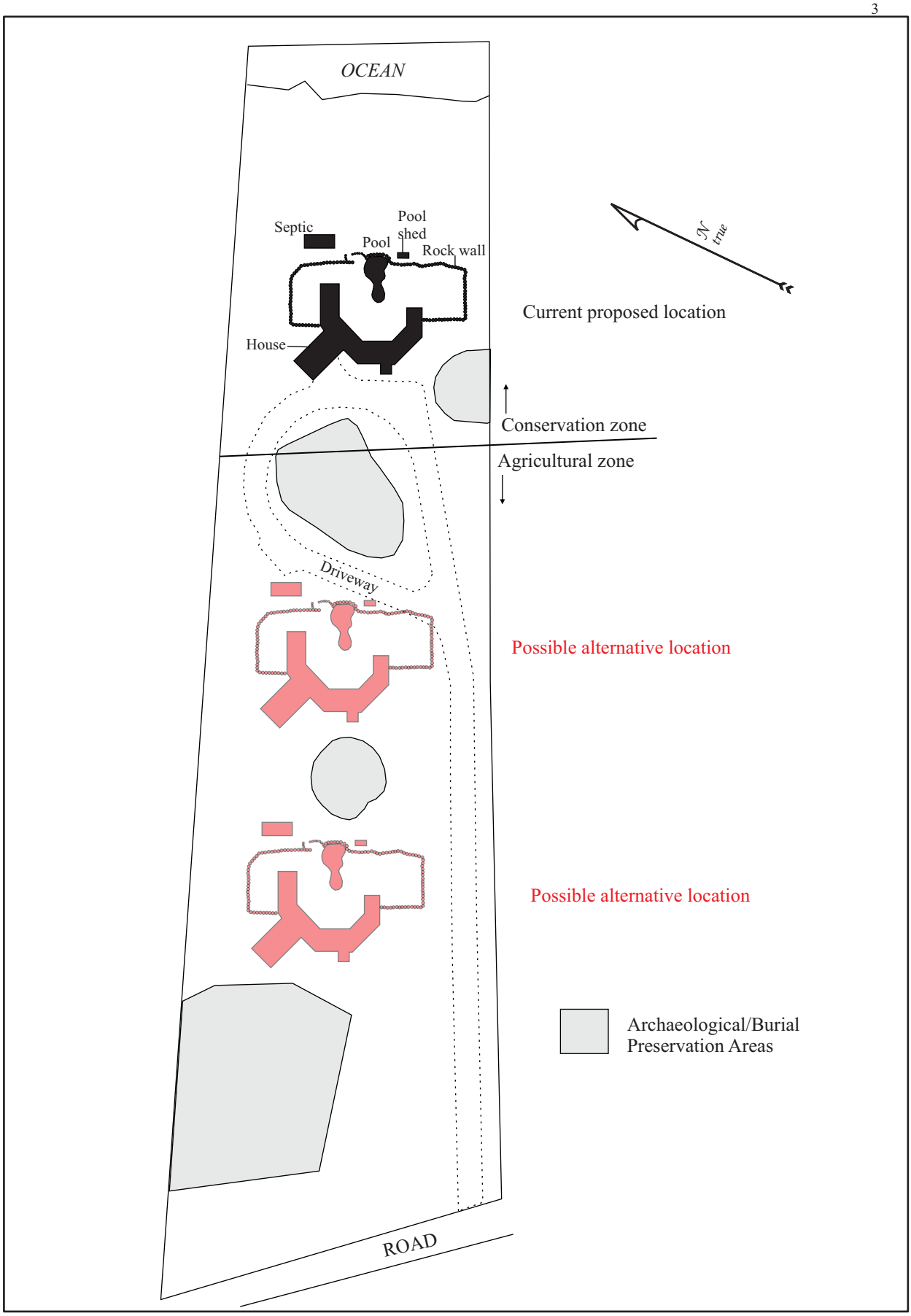
The current proposed location of the house is shoreward of all of the preservation areas, which form a "zone of preservation" occupying roughly the *mauka* 3/4 of the parcel. The current proposed location of the residence was taken into consideration when assessing cultural impacts, and while I did not prepare the Archaeological Preservation Plan or the Burial Treatment Plan, I would assume that the current proposed location was also a consideration during those planning processes. If the proposed residence is to be relocated, then a reassessment of impacts and a reconsideration of preservation buffer sizes will have to be conducted. The current location "beyond" the zone of preservation sites does not present an intrusive visual presence, which might not be the case if the residence was to be placed "within" the zone of preservation sites. As can be seen on the attached figure, and keeping the same configuration, the proposed residence will fit between preservation areas, but given the drastic "up and down" nature of the lava substrate in this area, substantial alteration of the natural terrain and vegetation (grubbing and grading) will have to occur, which will clearly impact the existing natural feel of the zone of the preservation sites.

I am not sure what justification OCCL offered for the suggested relocation, but in my professional opinion, given the archaeological/cultural resources present on the parcel, the most strategic in terms of historic preservation and the most culturally sensitive location for a single-family residence on the parcel is in the area shoreward of the zone of preservation sites.

If you should require further clarification and more information concerning this issue, please feel free to contact me.

Regards,

Bob Rechtman, Ph. D.
Principal Investigator



Alternative house site locations.

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ENVIRONMENTAL ASSESSMENT

GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

APPENDIX 2
Botanical Reports

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Conservation Area Botanical Survey
TMK: (3) 1-5-010:032
Prepared for John and Maureen Gap
February 21, 2007
by
Julie Leialoha

On February 19, at the request of Maureen Gap, I surveyed plants growing in the conservation zone on their property in the Puna district. The area surveyed encompassed the coastline to the top boundary along Beach Road just southeast of the Hawaiian Paradise Park subdivision.

The entire property including the area within the conservation zone has been altered by prior human activities. Pre-contact vegetation in this area would have been dominated by native coastal dry shrub-land as well as a mix of mesic species. The current make up, consist of a mix of introduced rangeland grasses, non-native annual and perennial herbaceous weed species along with remnants of native and indigenous species found within the conservation area closest to the shoreline. The dominant native species within the conservation area is Hala (*Pandanus tectorius*). Coconut trees and scattered patches of naupaka (*Sceavela sericea*) make up the dominant species closest to the ocean. Though the endemic species *Ischaemum byrone* has been found along the Puna coastline particularly in the Kalapan region, no plants were found on the property during this survey. The upper area of the property is dominated by a closed canopy stand of non-native rose apple intermixed with trumpet trees with very little understory.

The following list of species deals only with plants found within the conservation area of the aforesaid property.

Botanical Survey of TMK: (3) 1-5-010:032
Prepared for John and Maureen Gap

Native, Indigenous, and Polynesian Introduction

Cocculus trilobus	Huehue	Menispermaceae	Indigenous
Cocus nucifera	Niu, Coconut	Arecaeae	Pol
Cordyline fruticosa	Ti	Agavaceae	Pol
Morinda citrifolia	Noni	Rubiaceae	Pol
Pandanus tectorius	Hala	Pandanaceae	Native
Psilotium nudum	Moa	Psilotaceae	Indigenous
Scaevela sericea	Naupaka	Goodeniaceae	Indigenous
Waltheria indica	Uhaloa	Sterculiaceae	Indigenous
Ipomea pes-caprae	Pohuehue	Convolulaceae	Indigenous

Non-Native and Naturalized

Antigonon leptopus	Mountain rose	Polygonaceae
Arundina graminifolia	Bamboo orchid	Orchidaeae
Canavalia catharia	Maunaloa	Fabaceae
Cecropia obtusifolia	Trumpet tree	Cecropiaceae
Chamaecrista nictitans	Partridge pea	Fabaceae
Christella dentata	Pai'iiha	Thelypteridaceae
Chrysopogon spp.	Bermuda Grass	Poaceae
Clidemia hirta	Koster's curse	Melastomataceae
Coccoloba uvifera	Sea Grape	Polygonaceae
Cynodon dactylon	Bermuda Grass	Poaceae
Desmodium sandwicense	Spanish glover	Fabaceae
Digitaria spp.	Pangola grass	Poaceae
Lanatana camara	Lantana	Verbenaceae
Nephrolepis cordifolia	Sword Fern	Nephrolepidaceae
Paederia scandens	Maile Pilau	Rubiaceae
Panicum spp.	Panic grass	Poaceae
Paspalum conjugatum	Hilo grass	Poaceae
Phymatosorus scolopendria	Laua'e	Polypodiaceae
Polygynum spp.	Knotweed	Polygonaceae
Psidium cattleianum	S. Guava	Myrtaceae
Rubus rossifolisu	Thimbleberry	Rosaceae
Setaria gracillis	Perennial foxtail	Poaceae
Setaria palmifolia	Palmgrass	Poaceae
Stachytarpheta dichotoma	Ọwĩ	Verbenaceae
Syzgium jambos	Rose apple	Myrtaceae
Terminalia catappa	False kamani	Combretaceae
Tibouchina urvilleana	Princess flower	Melastomataceae

GAPP PROPERTY VEGETATION SUMMARY:

General Information:

The fieldwork for this report was conducted on Aug. 21, 2009. The study site consists of approximately 5 acres located along the beach road that runs from the Hawaii Paradise Park Subdivision to the Hawaiian Beaches Subdivision; in the area of the study site the road is unpaved but it is maintained and well traveled. The study site is located in the district of Puna and is on the windward side of the Island of Hawaii and is adjacent to the coast.

The study site can be divided into four vegetative communities with the largest being the Rose Apple (*Syzigium jambos*) forest that starts at the beach road and covers approximately 2/3 of the lot. The second vegetative community is dominated by Hala (*Pandanus tectoris*) this community is located between the Rose Apple forest and an area of the lot that has been mechanically cleared. The next vegetative community is comprised of a cleared area that lies between the Rose Apple forest and a Niu (*Cocos nucifera*) groove that borders the ocean side of the study area. The fourth community is located on a trail that has been bulldozed on the south side of the study site.

Vegetative Communities:

The Rose Apple Forest community is dominated by a tree canopy that is uniformly 15 to 25 feet tall and the canopy cover is over 90%. The dominant species in the canopy layer is Rose Apple and this species comprises over 75% of the canopy. Individuals of other tree species such as Mango (*Mangifera indica*) and Cecropia (*Cecropia obtusifolia*) can be observed scattered throughout this community. It should be noted that the Rose Apple trees have been greatly affected by a fungal pathogen that was recently introduced into Hawaii and the pathogen has damaged most of the young shoots and as a consequence the trees are being denuded and the area under the canopy is not as shaded as it would be if the trees had healthy foliage.

The understory of this community is open and is comprised of scattered shrubs such as Waiawe (*Psidium cattleianum*), Guava (*Psidium guajava*) and Melstoma (*Melastoma sp.*). These shrubs are scattered throughout the community and do not form thickets and the secondary canopy has acoverage of less than 30%.

The most noticeable feature of the herb layer in this community are patches of Awapuhi (*Zingiber zerumbet*). Shade tolerant species such as Basket Grass (*Oplismenus sp.*), Thimbleberry (*Rubus rosifolius*) and Maile Scented Fern

(*Pneumtoperis scolopendria*) are also found throughout this community.

The second vegetative community located within the study site is the Hala grove. This vegetative community comprises a small area of the study site but bears discussion for three reasons. The first is that the grove is located within the area of the site that is zoned conservation. The second reason is that this vegetative community is a remnant of a vegetative community that existed prior to the European discovery of Hawaii and the third is that the Hala grove either is very close to or borders the area where the owners are planning to build their house on the lot.

Because of the layer of Hala leaves on the ground, in this community the understory contains very few plants. A result of this is that seedlings and younger Hala plants were not observed in the area. Several younger Hala were noted on he ocean side of the grove but this area appears to be outside the study area.

The size of the Hala grove is so small that it will probably be degraded and overrun by aggressive exotic species that are already growing along the edge of the grove. These exotic species include California Grass (*Brachiaria mutica*), Maile Pilau (*Paederia foetida*), Melochia (Melochia umbellate) and Ipomoea (*Ipomoea alba*). These exotic species are already

well established along the edge of the forest and can be observed to be invading the edges of the Hala grove.

The next vegetative community is also located within the conservation zoned area in the study site and is an open area that is dominated by herbaceous species such as Morning Glory (*Ipomoea indica*), California grass and Maile Pilau. This herbaceous ground cover is so dense that shrub and tree species have not been able to establish themselves.

This vegetative community appears to be the result of the mechanical clearing of the area. This vegetative community is probably not yet stable and will change over time due to the process of succession.

The forth vegetative community is dominated by species that are prolific seeders and grow rapidly. This weedy community has developed in areas where the study site has been mechanically cleared and graded or grubbed. The mechanical clearing has led to a vegetative community that is currently changing.

In areas the community is dominated by seedlings of the rapidly growing Gunpowder Tree (*Trema* orientalis). The vegetation on this trail is dominated by specimens of Trema that are uniformly 8 to 10 feet tall. The understory on the trail is poorly developed and much of the ground is devoid of vegetation.

Discussion and Conclusions:

The driveway that will lead to the house site will follow this trail on the south side of the study site. The proposed house site is located in the Rose Apple forest and also in the mechanically cleared area. The footprint of the house site will also border the Hala grove.

The southeast corner of the house site will either come close to or border the Hala grove and if the grove is to be retained as a feature of the final site plan care should be taken to disturb the grove as little as possible during construction.

The vegetative communities found within this study site are for the most part composed of exotic and weedy species and are not noteworthy or significant. The Hala grove, while it is a remnant of a pre-European vegetative community, is too small to be significant and also many better examples of this vegetative type are located throughout the windward side of the island of Hawaii.

The few native species located within the study site are common and have the ability to do well in highly disturbed areas. It is interesting that Ohia (*Metrosideros polymorpha*) was not observed growing in the study site but can be seen in

other areas along the Beach Road and lots neighboring the study site. Several indigenous species that were observed on lots neighboring the site were not listed and they are also common species that are able to grow in disturbed areas.

There were no Rare or Endangered plant species as listed in the Federal or State of Hawaii Registers observed within the study site and the attached list records the Species Name, Plant Family, Common Name, Life Form and Status. The status of the plants are listed as being either Indigenous (Native) or Alien (Exotic).

Sept. 20, 2009 Version

Scientific Name	Family	Common Name	Life Form	Status*	
GAPP Property		Fieldwork 8/21/09			
List 9-12	9-13/ 9:00am	9/13 2:30 pm			
91/4 9:30pm	9-16 9=17	9-20 done			
Agave sp.	Agavaceae	Agave	Shrub	A	*
Ageratum conyzoides	Asteraceae	Ageratum	Herb	A	*
Ageratum houstonianum	Asteraceae	Ageratum	Herb	A	*
Alternanthera sp.	Amaranthaceae	Alternanthera	*Herb*	A	*
Asclepias curassavica	Asclepiadaceae	Bloodflower	Herb	A	*
Blechnum appendiculatum	Blechnaceae	Blechnum	Fern	A	*
Brachiaria mutica	Poaceae	California Grass	Herb	A	*
Buddleia asiatica	Buddleiaceae	Dog Tail	Herb	A	*
Canavalia cathartica	Fabaceae	Maunaloa	Vine	A	*
Cecropia obtusifolia	Cecropiaceae	Trumpet Tree	Tree	A	*
Chamaecrista nictitans	Fabaceae	Partridge Pea	Herb	A	*
Christella parasitica	Thelypteridaceae	Cyclosorus	Fern	A	*
Clidemia hirta	Melastomataceae	Koster's Curse	Herb	A	*
Clusia rosea	Clusiaceae	Autograph Tree	Tree	A	*
Cocos nucifera	Arecaceae	Niu	Tree	A	*
Commelina diffusa	Commelinaceae	Honohono	Herb	A	*
Conyza sp.	Asteraceae	Horseweed	Herb	A	*
Cordyline fruticosa	Agavaceae	Ki	Shrub	A	*
Crotalaria sp.	Fabaceae	Rattlepod	Herb	A	*
Cyperus halpan	Cyperaceae	Cyperus	Herb	A	*

Cyperus sp.	Cyperaceae	Cyperus	*Herb*	A+	*
Desmodium sandwicense	Fabaceae	Spanish Clover	Herb	A	*
Desmodium triflorum	Fabaceae	Desmodium	Herb	A	*
Digitaria sp.	Poaceae	Digitaria	*Herb*	A+	*
Dioclea wilsonii	Fabaceae	Dioclea	Vine	I?	*
Dioscorea pentaphylla	Dioscoreaceae	Dioscorea	*Vine*	A	*
Drymaria cordata	Caryophyllaceae	Pipili	Herb	A	*
Eleusine indica	Poaceae	Wiregrass	Herb	A	*
Emilia sonchifolia	Asteraceae	Flora's Paintbrush	Herb	A	*
Erechtites hieracifolia	Asteraceae	Erechtites	Herb	A	*
Ficus microcarpa	Moraceae	Chinese Banyan	Tree	A	*
Grammitis tenella	Grammitidaceae	Kolokolo	Fern	I	*
Hedychium flavescens	Zingiberaceae	Yellow Ginger	Herb	A	*
Hedyotis corymbosa	Rubiaceae	Hedyotis	*Herb*	A	*
Hippobroma longiflora	Campanulaceae	Star-of-Bethlehem	Herb	A	*
Hyptis pectinata	Lamiaceae	Comb Hyptis	Herb	A	*
Indigofera suffruticosa	Fabaceae	Indigofera	*Herb*	A	*
Ipomoea alba	Convolvulaceae	Moon Flower	Vine	A	*
Ipomoea indica	Convolculaceae	Morning Glory	Vine	I	*
Kyllinga brevifolia	Cyperaceae	Kyllinga	*Herb*	A	*
Lantana camara	Verbenaceae	Lantana	Shrub	A	*
Ludwigia octovalvis	Onagraceae	Ludwigia	Herb	I?	*
Lygodium japonicum	Schizaeaceae	Japanese Climbing Fern	*Fern*	A	*
Macaranga mappa	Euphorbiaceae	Bingabing	Shrub	A	*
Macaranga tanarius	Euphorbiaceae	Macaranga	Tree	A	*

Mangifera indica	Anacardiaceae	Mango	Tree	A	*
Melastoma sp.	Melastomataceae	Melastoma	Shrub	A	*
Melinis minutiflora	Poaceae	Molasses Grass	Herb	A	*
Melochia umbellata	Sterculiaceae	Melochia	Tree	A	*
Mimosa pudica	Fabaceae	Sleeping Grass	Herb	A	*
Morinda citrifolia	Rubiaceae	Noni	Shrub	A	*
Nephrolepis exaltata	Nephrolepidaceae	Sword Fern	Fern	I	*
Oplismenus sp.	Poaceae	Oplismenus	Herb	A	*
Oxalis corniculata	Oxalidaceae	Yellow Wood Sorrel	*Herb*	I?	*
Paederia foetida	Rubiaceae	Maile Pilau	Vine	A	*
Pandanus tectorius	Pandanaceae	Hala	Tree	I	*
Panicum maximum	Poaceae	Guinea Grass	Herb	A	*
Paraserianthes falcataria	Fabaceae	Albizia	Tree	A	*
Paspalum conjugatum	Poaceae	Hilo Grass	Herb	A	*
Paspalum urvillei	Poaceae	Vasey Grass	Herb	A	*
Passiflora edulis	Passifloraceae	Lilikoi	Vine	A	*
Persea americana	Lauraceae	Avocado	*Tree*	A	*
Phyllanthus debilis	Euphorbiaceae	Niruri	Herb	A	*
Phymatosorus grossus	Polypodiaceae	Maile Scented Fern	Fern	A	*
Pityrogramma calomelanos	Pteridaceae	Silver Fern	Fern	A	*
Plantago major	Plantaginaceae	Common Plantain	Herb	A	*
Pluchea symphytifolia	Asteraceae	Sourbush	Shrub	A	*
Polygala paniculata	Polygalaceae	Milkwort	*Herb*	A	*
Psidium cattleianum	Myrtaceae	Waiawi	Tree	A	*

Psidium guajava	Myrtaceae	Guava	Tree	A	*
Psilotum nudum	Psilotaceae	Moa	Fern Alley	I	*
Pteris cretica	Pteridaceae	Cretan Brake	Fern	I	*
Pycreus polystachyos	Cyperaceae	Cyperus	Herb	I	*
Rubus rosifolius	Rosaceae	Thimbleberry	Herb	A	*
Sacciolepis indica	Poaceae	Glenwood Grass	Herb	A	*
Samanea saman	Fabaceae	Monkeypod	Tree	A	*
Schizachyrium condensatum	Poaceae	Beardgrass	Herb	A	*
Scleria testacea	Cyperaceae	Scleria	*Herb*	I	*
Setaria palmifolia	Poaceae	Palmgrass	Herb	A	*
Sida rhombifolia	Malvaceae	Sida	*Herb*	I?	*
Solanum americanum	Solanaceae	Popolo	*Herb*	I?	*
Spathoglottis plicata	Orchidaceae	Malayan Ground Orchid	Herb	A	*
Spermacoce sp.	Rubiaceae	Spermacoce	*Herb*	A	*
Stachytarpheta jamaicensis	Verbenaceae	Stachytarpheta	Herb	A	*
Syzygium jambos	Myrtaceae	Rose Apple	Tree	A	*
Tacca leontopetaloides	Taccaceae	Pia	*Herb*	A	*
Terminalia catappa	Combretaceae	False Kamani	Tree	A	*
Torenia asiatica	Scrophulariaceae	Olaa Beauty	Herb	A	*
Trema orientalis	Ulmaceae	Gunpowder Tree	Tree	A	*
Vernonia cinerea	Asteraceae	Little Ironweed	Herb	A	*
Zingiber zerumbet	Zingiberaceae	Awapuhi	Herb	A	*

A = alien, E = endemic, I = indigenous, End = Federal and State listed Endanger9ed Species

ENVIRONMENTAL ASSESSMENT

GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

APPENDIX 3
Archaeological and Cultural Impact Assessment Reports

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SCS Project Number 1010-PP-2

A PRESERVATION PLAN FOR SITE 50-10-45-26660 LOCATED ON A 5.59-ACRE PARCEL IN MAKU`U AHUPUA`A, PUNA DISTRICT ISLAND OF HAWAI`I [TMK (3) 1-5-010: 032]

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Revised April 2009

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ABSTRACT

At the request of the landowner, Mr. John Gapp, Scientific Consultant Services (SCS), Inc. has prepared this Preservation Plan (PP) for Site 50-10-45-26660. The Preservation Plan follows an accepted Archaeological Inventory Survey of approximately 5.59 acres of land in Maku`u Ahupua`a, Puna District, Island of Hawai`i, Hawai`i [TMK: (3) 1-5-010:032] (Clark *et al*. 2008). During the course of the survey nine sites were newly identified. The sites documented include: Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features.

Site 50-10-45-26660, a Historic-era permanent habitation complex, is being preserved at the request of the landowner. Scientific Consultant Services, Inc. (SCS) has prepared this Preservation Plan in consultation with the State Historic Preservation Division (SHPD). This Preservation Plan has been prepared specifically for Site -26660, in advance of the construction of a proposed single family dwelling. This document follows the above-mentioned Clark *et. al.* (2008) archaeological inventory survey and focuses specifically on interim and long-term permanent preservation of Site -26660. As Site -26659 is in close proximity to Sites -26662 through -26664, it is included in Preserve Area C, and will be specifically discussed under separate cover in the Burial Treatment Plan. Site 50-10-45-26659 is also being preserved at the landowner's request.

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INTRODUCTION

At the request of Mr. John Gapp, the landowner, Scientific Consultant Services, Inc. (SCS) has prepared this Archaeological Preservation Plan for Site 50-10-45-26660, a Historic-era permanent habitation complex. This site is being preserved at the landowner's request (Clark *et al.* 2008: 113). Site 50-1-45-26660 exists within an approximately 5.59-acres property located in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010: 032] (Figure 1 and 2). This Preservation Plan follows an Archaeological Inventory Survey (Clark *et al.* 2008), and focuses specifically on interim and long-term permanent preservation of Site 50-10-45-26660. This document has been prepared in advance of the construction of a single family dwelling.

During the course of the above-mentioned survey nine sites were newly identified. The sites documented include: Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features (Clark *et al*. 2008). Please note Site -26659 is also being preserved at the landowner's request. As Site -26659 is in close proximity to Sites -26662 through -26664, it is included in Preserve Area C, and will be specifically discussed under separate cover in the Burial Treatment Plan.

This Preservation Plan follows procedures outlined in the Hawai`i Administrative Rules, Title 13: Department of Land and Natural Resources, Subtitle 13: State Historic Preservation Division Rules, Chapter 277: Rules Governing Minimal Requirements for Archaeological Site Preservation and Development (DLNR/SHPD 2003). This Preservation Plan provides standards to ensure proper preservation and a "no adverse effect" in the public's interest (*ibid.*).

Preservation means the mitigation form in which a historic property is preserved, whether through avoidance and protection (conservation) or exhibition (interpretation). There are four steps to preserving a site, the first of which is executed here: preparation of a Preservation Plan. The other steps include review and approval of the Preservation Plan by SHPD prior to preservation work, execution of the Preservation Plan, and verification by SHPD that the plan has been successfully executed.

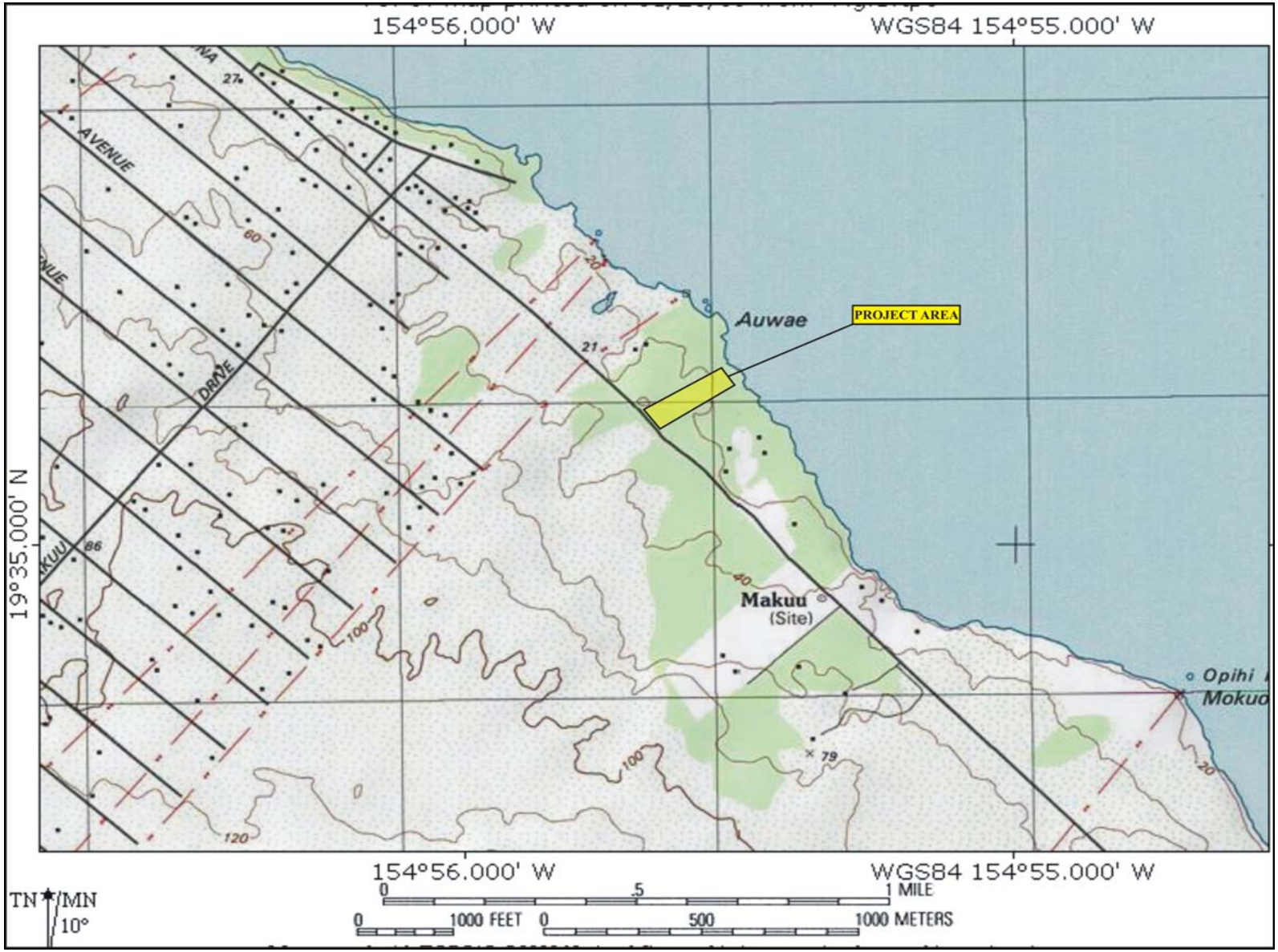

Figure 1: USGS Quadrangle (Pahoa North) Showing Project Area.

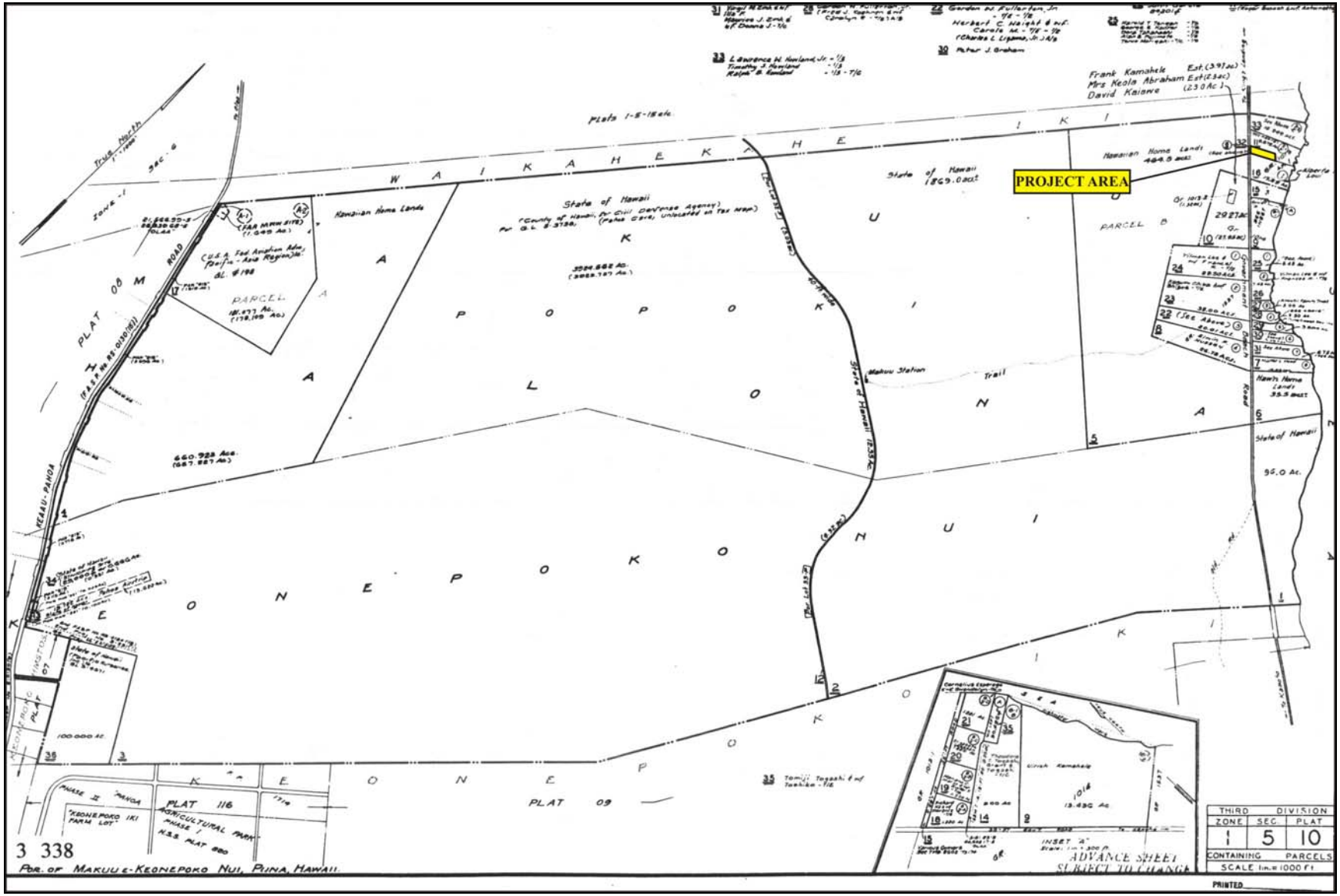

Figure 2: Tax Map Key [TMK: (3) 1-5-010:032] Showing Project Area.

This Preservation Plan provides (1) descriptions of: Site -26660 and its contexts within the subject parcel, (2) previous archaeology at the parcel, (3) preservation procedures for Site -26660, (4) specific methods needed to implement preservation procedures and, (5) verification of the implantation of permanent preservation.

ENVIRONMENTAL SETTING

PROJECT AREA

The project area consists of approximately 5.59-acres of land located just southeast of the Hawaiian Paradise Park Residential Subdivision in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010: 032] (see Figures 1 and 2). The parcel is a long, narrow rectangular shaped tract of land flanked by undeveloped parcels on its north and south sides, by the Old Government Beach Road on its west (*mauka*) edge, and the coastal setback on its east (*makai*) edge at 0 to 40 feet above sea level. Terrain on the parcel gently slopes northeast and is comprised of *pahoehoe* lava flows of the Kilauea Volcano. A majority of the ground surface is exposed coarse bedrock containing pockets of sediment.

SOILS

Soils within the general area of the project parcel are classified as the Opihikao series (rOPE), extremely rocky muck (Sato *et al.* 1973). Muck soils, typically found in native forests or used as pasture, is composed of well-drained, highly acidic, thin organic soils approximately 3 to 10 inches deep overlying *pāhoehoe* bedrock. The muck is rapidly permeable while permeability of the bedrock is very slow, but rapid through cracks in the *pahoehoe*. Runoff is slow and erosion hazard is slight.

VEGETATION

Flora present across the parcel is varied and includes native and non-native species of grasses, bushy plants, and trees. The over story consists of guava (*Psidium guajava*), mango (*Magifera indica*), *hala* (*Pandanus odoratissimus*), rose apple (*Eugenia jambos*), octopus tree (*Shefflera actinophylla*), coconut palm, (*Cocos nucifera*). The under story consists of *ti* (*Cordyline fruticosa*), *laua`e* (*Phymatosorus scolopendria*), beach naupaka (*Scaevola sericea*), ginger (*Zingaberaceae*) and sisal (*Agave Sisalana*), as well as several additional non-native species of grasses, vines, weeds, and ferns (Clark *et al.* 2008). Vegetation in the makai portion of the project area consists of low-lying vines and grasses, and is absent of tall trees, representative of previous mechanical disturbance in that particular area of the parcel (*ibid.*).

CLIMATE

The climate of Hawai`i's Windward coast is generally mild with temperatures ranging anywhere from the 90s, to a minimum in the low 50s at lower elevations throughout the year. Temperatures vary greatest between the two prominent seasons, known to the Hawaiian Islands as the wet and dry seasons. The wet season occurs during the cooler months of November through April, and the dry season occurs during the warmer months of March through September. This range of temperature is exceeded by the daily range in most parts of the island. However, temperatures on Windward coasts exposed to trade wind air off the sea vary the least and are consistently cooler overall (Armstrong 1983).

Rain fall in the region ranges from approximately 60 to 100 inches of rain per year (Clark *et al.* 2008). Frequent rain showers, and low-lying bedrock present across the parcel is causative of standing water, and has consequently created a breeding habitat for mosquitoes in the project area (*ibid.*).

CULTURAL HISTORICAL CONTEXT

THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169-70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I: 145). The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were thus made available and private ownership was instituted, the *maka`āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16).

In 1848, as a result of the *Māhele*, the land of Maku`u ahupua`a had been retained as Government Lands and no LCAs or Kuleana parcels were awarded. Coastal portions of the A*hupua`a* of Maku`u as well as Pōpōkī, and Hālona were eventually divided however, and sold as fee simple Land Grants. In 1852, a portion of the current project area became Land Grant No. 1013, Lot 1 and was acquired by D.W. Maiau (Clark *et al.* 2008).

HISTORICAL CONTEXT

In 1848, a survey of schools conducted by the Hawaiian Government recorded a schoolhouse in Maku`u Ahupua`a, and lists Land Grantee Maiau as the teacher, Maiau's teachers salary, the number of students attending, and the academic curriculum. By 1873 - 1874, the Maku`u school was noted once again in a period report submitted by Puna school, which reported the same information as in the previous report including an N. Kanihoa as the Maku`u school teacher, a J. Elderts as the school supervisor, the schoolhouse as being in good condition, and the birth and deaths known to Maku`u over that period (*ibid.*).

In 1873 construction of the Government Road, likely the route of an old pedestrian trail, from Hilo through Puna had been completed. Around this time cattle ranching had found its start in the area when rancher Obed B. Spencer leased the ahupua`a of Kea`au, just northwest of Maku`u from guardians of William C. Lunalilo, Charles Kanaina and Charles R. Bishop. Spencer's ten year lease was transferred, and his personal property which included "…buildings and improvements…all [the] flocks of cattle running on the land of Keaau aforesaid and on the adjoining lands branded 'OS' or ' ' together with [the] brand 'OS' and also [the] flock of goats and sheep running on the land of Keaau aforesaid and the adjoining lands and also [the] fowls and hogs on the lands…", as stated in the assignment of the lease and Bill of sale, was sold to J.O. Dominis and R.A. Lyman. Dominis and Lymans newly acquired leased lands reportedly inventoried 300 "OS" branded cattle, and 4,000 goats. Over the course of the following year, the two expanded their ranching endeavors leasing additional lands in neighboring *ahupua`a*, but by 1876 Charles R. Bishop bought Lyman's interest in the *ahupua`a* of Kea`au for $8,333.00, and in turn assigned the lease to the Hawaiian Agricultural Company in consideration of 120,000.00. In 1877 J.E. Elderts and William H. Shipman in consideration of $33,000.00 were assigned lease and business interests in Kea`au ahupua`a by the Hawaiian Agricultural Company. Eldert's and Shipman's new partnership in ranching began to prove lucrative, and by 1879 their holdings included the majority of lands between Kea`au and Kapoho *ahupua`a* (*ibid.*).

During this time reports by the Government Schools of the Puna District had noted a deterioration in the standing of the schools of Keahou and Maku`u, due to a decline in the contribution by skilled teachers, and of income generated by the schools fields; owing to the trampling of produce by ranch animals. By 1891 the report noted that the schoolhouse in Maku`u was no longer standing, and that Kea`au school was gone (*ibid.*).

The late 1800s had begun a transformation in land use and tenure in the Puna District. Before 1900 Shipman had sole interest in Kea`au and lands of the neighboring *ahupua`a*. Approximately 4,000 acres of these lands he sold to various buyers for coffee cultivation, and leased another 4,000 acres to the Ola`a Sugar Company, Ltd. By 1900 a new highway been completed and in the early part of the 20th century radical changes in the Puna District had become evident. As ranching, sugarcane, coffee, and lumber became the dominating industries, a decline of population in the area resulted in the near disappearance of Traditional agriculture systems (*ibid.*).

PREVIOUS ARCHAEOLOGY

There have been numerous archaeological investigations in Maku`u, Pōpōkī, and Hālona *ahupua`a*. Among the previous studies, nine were conducted in the *ahupua`a's* coastal regions near the current project area, and six at locations further inland. For a more thorough discussion of the archaeology conducted in the vicinity of the current project area, please see Clark *et al.* 2008.

Among the earliest of archaeological studies in the vicinity of the project area, was an endeavor by Hudson to survey the archaeological sites from Waipio Valley to the Ka`u District of the East Hawai`i Island coast. In his attempt to survey such a length of coast, the features recorded ranged from shrines to mounds. Hudson didn't document any sites in Maku`u but only alluded to the "…mazes of old walls and occasional inclosures giving evidence of the former population and extensive cultivation of this stretch of coast" between Mokuopihi and Waihakiula (*ibid*: 16)

In 1990 Barrera conducted the first phase of a three phase archaeological study on [TMK (3) 1-1-10: 033], a 14-acre parcel adjacent the coast, northwest of the current project area. Barrera's Archaeological Inventory Survey recorded six site complexes, all with multiple component features. These sites were documented as SIHP Sites: -14675, -14981, -14982, -14986, -14984, and -14985 and included a broad range of feature types including modified outcrops, depressions, lava blisters, walls, mounds, platforms, enclosures, and terraces. The sites were interpreted as agriculture, habitation, and possible burial dating from pre-Contact to the Historic era (*ibid.*).

In the second phase of the archaeological study of the above parcel, SCS conducted burial testing (Chaffee and Spear 1993) at a mound feature of Barrera's Site -14675, as well as

two platform features and a mound feature at Site -14985. Testing resulted in the documentation of three subsurface burial chambers within the two mound features, and one of the platform features. Two of the three subsurface features contained skeletal remains and grave goods dating to the Historic period. The third, lacking human remains, was interpreted as such based on the features formal characteristics.

Finally, in the parcels third phase of archaeological investigations, Data Recovery was conducted at two enclosures, a terrace, a sealed lava blister, and faced mound features of Site -14675, and at Site-14985 terrace feature (Spear *et al.* 1995). Artifacts from the excavations included modified basalt and volcanic glass, the majority of which were recovered from the terrace feature of Site -14985. Radiocarbon dating yielded an estimated date of 349 to 59 B.P., a 2 sigma calibrated result of A.D. 1660 to 1950. The sites were interpreted as permanent habitation from the late pre-Contact to the late 19th century (*ibid.*).

A reconnaissance survey of a six mile corridor for the proposed Kapoho-Keaukaha Highway route spanning from Waiakahiula Ahupua`a to Kea`au Ahupua`a through the Puna District was conducted in 1974 by Bishop Museum (Ewart and Luscomb). The findings were extensive and consisted of several archeological sites composed of single features, and feature complexes.

Archaeological Inventory Survey conducted on a 38–acre parcel, just *mauka* of old Government Road, south of the current project area documented five sites (Clark *et al.* 2007). The sites identified ranged from pre-Contact to Historic period sites and included a pre-Contact agricultural shrine.

SUMMARY OF ARCHEOLOGICAL INVENTORY SURVEY

In 2008 Rechtman Consulting LLC., conducted Archaeological Inventory Survey of an approximately 5.59-acres property located in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010: 032]. During the course of the survey nine sites, comprised of 67 features, were newly identified (Clark *et al.* 2008) (Figure 3). The sites documented include State Inventory of Historic Properties (SIHP) Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a

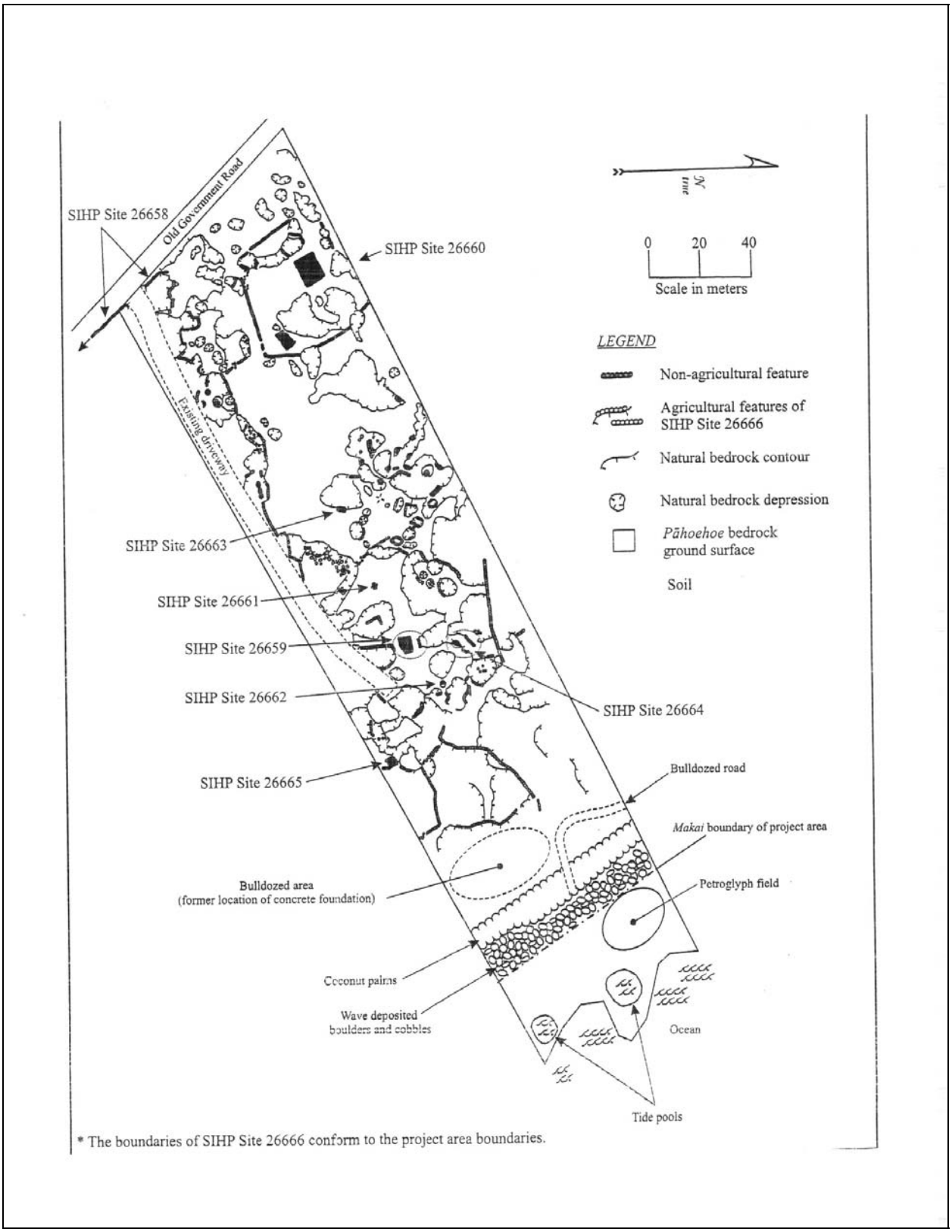

Figure 3: Plan View Map Showing Project Area, Location of Sites 50-10-45-26658 Through -26666 (adapted from Clark *et al.* 2008).

platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features.

All of the sites identified during the survey evaluated for significance according to the established criteria for the Hawai`i State Register of Historic Places §13-275-6. The five criteria are classified as follows:

Criterion A: Site is associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B: Site is associated with the lives of persons significant to our past;

Criterion C: Site is an excellent site type; embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual construction;

Criterion D: Site has yielded or has the potential to yield information important in prehistory or history; and).

Criterion E: Site has cultural significance to an ethnic group; examples include religious structures, burials, major traditional trails, and traditional cultural places (State of Hawai`i criteria only).

Sites 50-10-45-26658 through -26666 have been found to be significant under Criterion D, for information content. In addition the burial sites, Sites -26662 through -2665, have been found to be significant under Criteria E, for cultural significance. As stated elsewhere in this document Site 50-10-45-26660 is being preserved at the landowner's request (Clark *et al.* 2008: 113).

SITE SELECTED FOR PRESERVATION

As stated elsewhere in this report, Site 50-10-45-26660 has been interpreted as Historic Period habitation site which is being preserved at the landowner's request (*ibid*). Site 50-10-45-26660 is an enclosed habitation complex consisting of five features including a core filled rock wall enclosure, two modified depressions, a cobble pavement, and a platform (Figure 4). This site is situated on an elevated linear spine of *pāhoehoe* that runs from the old Government

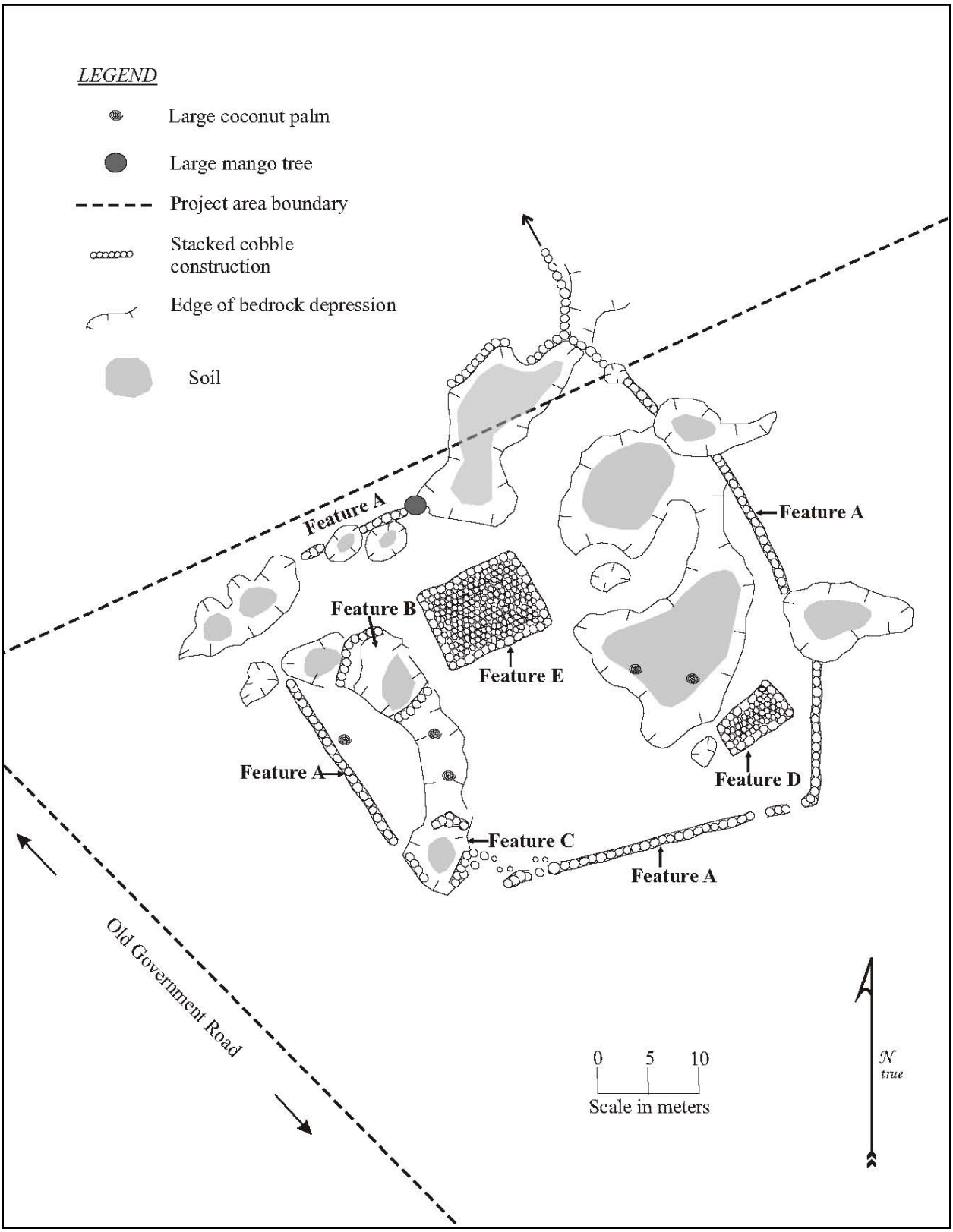

Figure 4: Plan View Map of Site 50-10-45-26660 (adapted from Clark *et al.* 2008).

Road, *makai* toward the coast, which incidentally offers the best pedestrian access *mauka/makai* (west/east) across the parcel. A detailed description of this site and its constituent features are presented below from Clark *et al.* (2008:34 - 51).

SIHP SITE -26660

SIHP Site 26660 is an enclosed complex located in the northwestern portion of the project area, along the northern parcel boundary, approximately 20 meters makai of the old Government Road [Figure 3]. The complex occupies a 50 x 50-meter area, and consists of five features including an enclosing wall (Feature A), two modified depressions (Features B and C), a pavement (Feature D), and a platform (Feature E). Feature B-E are all located within an enclosed area created by Feature A [Figure 5]. Sites 50-10-45-26660 has been found to be significant under Criterion D, for information content

Feature A

Feature A is a core-filled rock wall that encloses Site 26660 [see Figure 5]. The wall consists of four sections that combine to form an enclosure around the other features of the site. All four sections stand roughly 0.6 to 1.0 meter in height and are 0.5 to 0.7 meters wide. With the exception of a few areas of collapse, all of the sections are generally in good condition and consist of stacked *pāhoehoe* cobbles standing three to five courses high. The wall does not cross several bedrock depressions that occur naturally within the complex, instead the vertical edges of the depressions act as the wall. At these locations, the stacked wall is built right up to the edge of the depression, discontinued, and then restarted on the opposite side. The eastern wall section of Feature A runs north/south and measures 51.0 meters long. There are two gaps in this section where bedrock depressions are located and the vertical edges act as the wall. The northern most portion of this section continues north out of the project area following the edge of a bedrock outcrop, but also turns west along the edge of a depression forming a portion of the northern wall. The southern wall section runs east/west and measures 32.0 meters long. A waterworn cobble was observed in the middle of this wall section. At the eastern end of the southern section there are two breaks in the wall that appear to be entryways into the site. The breaks are separated by a 2.2 meter long section of core-filled rock wall. The eastern gap measures 2.5 meter wide and the western gap measures 1.0 meter wide. The western wall section runs north/south and measures 25.0 meters long. This section crosses over raised bedrock and runs between two bedrock depressions. These two bedrock depressions create the northwest and southwest corners of the entire enclosed area. The northern wall section runs east/west and measures 13.0 meters long. This section of the wall consists of two segments. There are steep bedrock depressions on either side of the two wall segments as well as in-between them, separating the two. There is a very large and old mango tree present at the makai end of the northern wall section.

Feature B

Feature B is a modified depression located 5.0 meters east of Feature A's western wall section, and 2.5 meters west of Feature E, in the northwestern portion of the site [see Figure 5]. The depression measures 7.0 meters by 4.5 meters and is 1.4 meters deep. Cobbles cleared from the central portion of the depression are

piled/loosely stacked along its northern and southern edges to a height of 40 centimeters. It appears that the cobbles were cleared to the edges of the depression to expose the soil beneath them. As a result, the floor of the depression consists primarily of thin soil. A shallow bedrock overhang that measures 0.7 meters tall by 1.4 meters deep is present at the western end of the depression. Three large *Cellana* sp. shells were observed on ground surface within the overhang. Several plastic grow bags were also present within the depression. The *Cellana* sp. shells may have been discarded from the nearby platform (Feature E), or discarded more recently by whomever left the plastic grow bags at the feature.

Feature C

Feature C is a modified depression located in the southwestern corner of the site, approximately 12 meters south of Feature B [see Figure 5]. The depression measures 7.5 meters by 5.8 meters and is 1.4 meters deep. The edges of the depression consist of vertical bedrock with some cobbles piled against the base, and other cobbles stacked along the upper edges to a height even with the exterior ground surface primarily in the northeast corner. The stacking begins roughly 0.4 meters above the floor of the depression and stands up to 1.0 meter tall (three courses). The floor of the depression consists of thin soil. It appears that the cobble modification to the depression was created during the clearing of the floor to expose the soil. Based on the presence of soil at Feature C, it is likely that the depression was used as a household planting area similar to Feature B.

Feature D

Feature D consists of a pavement located in the southeastern corner of Site 26660 [see Figure 5]. The feature measures 7.7 meters long by 4.0 meters wide. It is rectangular in shape, and angled in a northeasterly/southwesterly direction along its long axis. Feature D is constructed on a fairly level bedrock ground surface along the southeastern edge of a large soil-filled, bedrock depression with vertical sides. Two tall coconut palms are growing within the depression that may have been at the site when it was occupied. Several smaller coconuts, from these larger ones, are growing on and around Feature D. The edges of the pavement consist of a single course of large sized cobbles and small sized boulders that stand 10 to 40 centimeters above the surrounding bedrock ground surface. The northwest corner edge of the pavement, where bedrock drops-off into the depression, is slightly taller, consisting of large sized cobbles stacked to a height of 60 centimeters. The level surface of Feature D is neatly paved with medium to large sized cobbles, although rose apple trees growing out of the feature have caused some damage. Two waterworn cobbles are present along the southeastern edge of the pavement, and several modern plastic grow bags were noted to the south of the feature.

Feature E

Feature E is a platform located in the northwestern corner of Site 26660, 2.5 meters east of Feature B [see Figure 5]. The platform is roughly square, measuring 10.5 meters (northwest/southeast) by 9.5 meters (northeast/southwest). It is constructed with medium to large sized cobbles stacked two to four courses high along the exterior edges. The edges stand 40 to 60 centimeters above the surrounding bedrock ground surface along the northwest edge, 55 to 60

> centimeters along the northeast edge, 20 to 35 centimeters along the southeast edge, and 30 to 80 centimeters along the southwest edge. The level surface of the platform is paved with small to medium sized cobbles. A possible posthole is present in the southwestern corner of the platform's surface. The hole is circular and lined by large sized cobbles. It measures 50 centimeters in diameter by 30 centimeters deep. Portions of the platform's edges and surface have been disturbed by roots from several large rose apple trees growing on Feature E. A possible entryway to Feature E is located in the center of the northwestern edge. The possible entryway consists of an intermediary step between ground surface and the platform's surface. The step measures 2.4 meters by 0.7 meters. It is cobble paved, but covered by sloping cobble collapse. The step has a definite, single-course, cobble alignment along its northwestern edge, and a probable alignment mixed with collapsed surface cobbles along its southeastern edge. The step stands 25 centimeters above ground surface and 30 centimeters below the platform surface.
>
> …Based on the size and formal attributes of the features, it is likely that Feature E was the primary residence at the complex with Feature D serving an ancillary role. Both of these features probably supported roofed structures. Feature A marks the boundaries of the complex, and likely served as an exclosure, keeping livestock out of the residential area. Features B and C, based on the presence of soil, may have functioned as household planting areas (*ibid.*).

Preservation of the above-described site will take the form of avoidance and protection, also referred to as *conservation*. There are no immediate plans for signage for Site -26660. Site 50-10-45-26660 is located on private land and there are currently no plans for allowing direct public access to this site. However, there could be special provisions accorded Native Hawaiian organizations and any other groups so permitted by the landowner(s) for allowing access to the site for cultural practices, instruction, or research. No additional excavation or research will occur at Site -26660 unless first approved by the landowner(s) and the SHPD.

PRESERVATION METHODS

INTERIM PRESERVATION

Short-term preservation measures at Site -26660 will include the delineation of an interim buffer zone of no less than 20.0 feet (6.0 m) (Figure 5). This interim buffer zone will be established from the outer edges of all archaeological features comprising both sites. Prior the start of any construction work within the project area, orange construction fencing will be erected along the interim preservation zone. The construction crew will be instructed about the meaning of the fencing and the significance of the preserve area prior to the commencement of

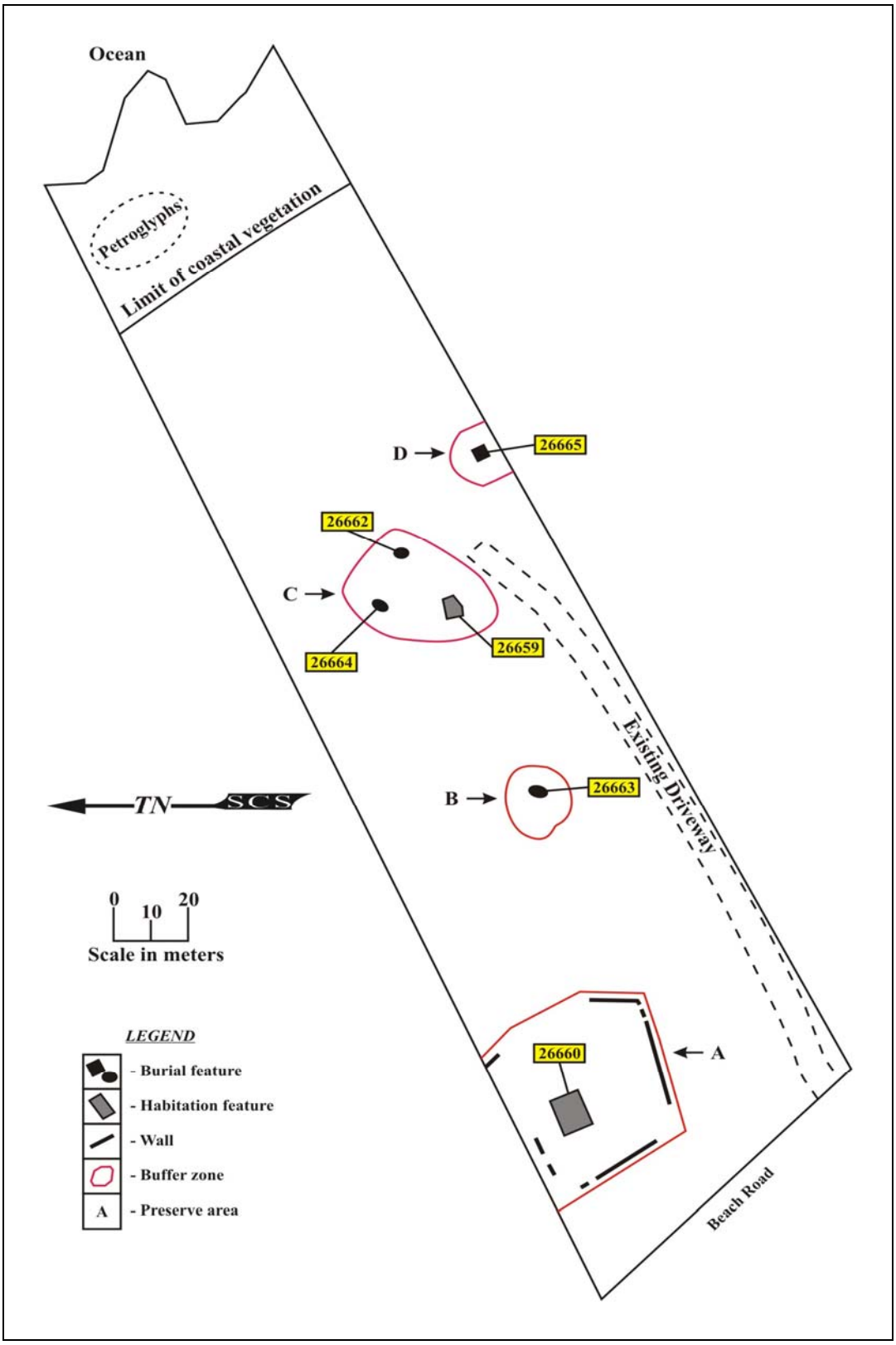

Figure 5: Plan View Map Showing Locations and Permanent Buffer Zones of Preserved for Site 50-10-45 60 (adapted from Clark *et al.* 2008).

the construction work. It is the landowner's responsibility to maintain the site and the orange fence line during all phases of project area construction.

PERMANENT PRESERVATION

Permanent preservation measures at Site -26660 (Preservation Area A) will include the delineation of a permanent buffer zone of no less than 20 feet (6.0 m) (see Figure 5). No construction may occur within the confines of these parameters. The permanent preservation boundary may be marked with a permanent gated fence or natural landscaping barriers that are selected to fit in with the natural topography of the land prior to development (*e.g.*, endemic or Polynesian-introduced vegetation) may be used. If possible, the permanent preservation measures will be constructed of a material consistent with the site's historical context. A fence, gate, or wall may be constructed of natural materials such as local woods and rock. If planting of endemic or Polynesian-introduced vegetation is used, plants will be a minimum of three feet from any archaeological feature to avoid root disturbance. It is the landowner's responsibility to maintain the site.

As stated throughout this document, the preservation and mitigation measures for Sites -26659, -26662, -26663, -26664, and 26665 will be discussed under separate cover in the Burial Treatment Plan.

Interim and long-term preservation procedures are summarized below:

- During all construction phases, at any location on the subject property, an interim preservation boundary will be established by erecting orange, orange plastic construction fencing within a 20 feet (6.0m) perimeter of Site -50-10-45-26660.

- The permanent preservation zone surrounding all features of Site 50-10-45-26660 will be 20 feet (6.0 m). This permanent preservation zone must be measured so that the perimeter is established at least 20 feet (6.0 m) away from any given point of the nearest feature of the site.

- No earth moving or construction will be allowed within the interim or permanent preservation zone, and no equipment may enter these perimeters at any time.

- It is the responsibility of the landowner to ensure that SIHP site locations and interim and permanent preservation zones are surveyed and plotted on a survey map prior to the start of construction activities. Successive maps of the project area will also note the permanent preservation zones.

- The permanent buffer zone encompassing each feature shall be kept free of all structures. Only landscaping may occur within the permanent buffer zone (planting of endemic or Polynesian-introduced species is permitted as part of preservation maintenance). Planting of endemic or Polynesian-introduced vegetation will be a minimum of three feet from any archaeological feature to avoid root disturbance. Clearing of vegetation within the buffer zones and the features themselves will be allowed, although large, free-standing trees and those growing directly against any part of the structure will remain in place. However, any trees growing next to a structure may be cleared to ground level by mechanical means (chainsaw). Round-Up or other similar chemical spray may be used on such things as stumps to clear roots from continually growing in the area; the roots will not be manually pulled out as the roots may disturb existing site architecture.

- All existing stones occurring within the features and buffer zones, whether stacked or not, will be left in place.

- Should storm, earthquake, or other natural or cultural damage occur to the site and its environs, and should this necessitate repairs, the land owner will notify the SHPD of the situation and reach an agreement with the SHPD on how to proceed prior to implementing any alterations to the ground surface, site, or vegetation within the preservation zone.

- Modern debris generated by occupants of the parcel, or debris that may have been blown onto the parcel, may be removed by hand from within preservation easements whenever is deemed necessary by the landowner.

- If the landowner finds that the features or buffer zones have been disturbed in any way, the landowner will immediately notify SHPD. Repairs or stabilization of the damages cannot proceed until approved by SHPD.

- These provisions are made for on-going preservation of the site. This portion of the project area will be preserved, with the preservation perimeter and protocol being binding on successive owners of the lot.

PRESERVATION VERIFICATION

Verification that interim preservation measures are in place will be made by SCS prior to the construction start date. In addition, verification that permanent preservation measures are in place will be made by SCS following completion of the development project. Verification will take the form of a phone call and/or written notification to SHPD by SCS if compliance with archaeological preservation methods is not 100% maintained according to this Preservation Plan.

CONSULTATION

In accordance with HRS § 13-277-3 (4), we have consulted with Charles Young, Chair of the Hawai`i Island Burial Council, Dutchie Saffrey, Puna District Representative of the Hawai`i Island Burial Council, and Lukela Ruddle, Hilo District representative of the Office of Hawaiian Affairs indicating SCS was initiating the consultation process and to inquire if they were aware of any individuals or group who have knowledge pertaining to the history of these sites. The consultation period extended from February 9 to April 9, 2009.

On February 13, 2009, we initiated the consultation process by sending letters to individuals and organizations that may be aware of individuals or other organizations of the Puna District and Hawaiian community who may have knowledge of the history of the project area (Appendix A). These organizations and individuals include: Charles Young, Hawai`i Island Burial Council Chair; Dutchie Saffrey, Hawai`i Island Burial Council Puna District Representative, and Lukela Ruddle, Office of Hawaiian Affairs, Hilo District Representative.

On February 24, 2009, SCS conducted a follow-up telephone call to Mr. Charles Young. Mr. Young indicated he had not received the SCS consultation letter as he had not gone to his Post Office Box. During the telephone conversation with SCS, Mr. Young recommended discussing the mitigation measures with the State Historic Preservation Division (SHPD), Hilo. Based on this recommendation, SCS contacted Ms. Morgan Davis, SHPD Assistant Hawai`i Island Archaeologist via telephone and e-mail regarding the preservation methods at Sites -26659 and -26660. In addition, Ms. Davis agreed to discuss the above-described preservation measures with Analu Josephides, SHPD Cultural Historian.

On February 26, 2009 we contacted Lukela Ruddle (Office of Hawaiian Affairs, Hilo District Representative) via telephone as a follow-up to our letter. Ms. Ruddle stated she had received the consultation letter and apologized for not responding. During the telephone conversation with SCS Ms. Ruddle requested we send a copy to Kai Markell, Office of Hawaiian Affairs, Honolulu). We complied with Ms. Ruddle's request and sent a consultation letter to Mr. Markell.

We did speak briefly with Dutchie Saffrey via telephone on February 26, 2009, and were able to verify receipt of the consultation letter. Ms. Saffrey also apologized for not responding. However, due to a faulty connection, the call was disconnected and repeated attempts to reach Ms. Saffrey by phone only reached her answering machine. As Ms. Saffrey had indicated in our

brief conversation that she had been having technical difficulties with her phone, SCS left a voice-message on Ms. Saffrey's answering machine with an SCS e-mail address.

On March 4, 2009, Scientific Consultant Services conducted a follow-up telephone call to Kai Markell. Initially, Mr. Markell did not answer and a voicemail was left on his answering machine. In a subsequent telephone call to Mr. Markell the same day, we were able to reach him. During the ensuing conversation, Mr. Markell stated he did not receive a copy of the consultation letter we mailed on February 26, 2009. So, we transmitted the consultation letter and the five associated figures electronically to him on March 4, 2009. He indicated, via e-mail, that he had received the letter and figures.

RECOMMENDATIONS

Due to the presence of human burials identified during Archaeological Inventory Survey of TMK: (3) 1-5-010:032 a program of Archaeological Monitoring is recommended during all construction related ground altering activities conducted on the subject property.

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APPENDIX A: EXAMPLE OF CONSULTATION LETTER

(NO ATTACHMENTS)

February 13, 2009

Rechtman Consulting, LLC recently conducted an Archaeological Inventory Survey of a 5.586 acre property located in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010:032] (Figures 1 and 2). During the course of the survey nine sites were newly identified (Figure 3). The sites documented include: SIHP Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features. For a detailed account of the findings please refer to (Clark *et al.* 2008) An Archaeological Inventory Survey of TMK: 3-1-5-010:032, on file at the State Historic Preservation Office, Hilo.

We are now in the process of preparing a Burial Treatment Plan for the four burial sites, preserving these sites in place for perpetuity, and a Preservation Plan specifically focusing on interim and long-term, permanent for Sites -26659 and -26660. In compliance with the DLNR/SHPD Hawaii Revised Statutes (HRS) §13-277 and §13-300, we are consulting with individuals and groups who may have knowledge of the history of this area. We are writing to you to inquire if there are any contacts, of whom you may be aware, who have knowledge pertaining to the history of these sites.

Thank you in advance for your comments and help. We look forward to hearing from you.

Sincerely,

Cathleen A. Dagher
Senior Archaeologist
Scientific Consultant Services, Inc.

Attachments:

Figure 1: USGS Quadrangle (Kilohana) Map Showing Project Area.
Figure 2: Tax Map Key [TMK: (3) 1-5-010:032] Showing Project Area.
Figure 3: Site Location Map.

SCS Project Number 1011 -BTP-4

BURIAL SITE COMPONENT OF A PRESERVATION PLAN FOR SITES 50-10-45-26659, -26662, -26663, -26664, AND -26665 LOCATED ON A 5.59-ACRE PARCEL IN MAKU`U AHUPUA`A, PUNA DISTRICT ISLAND OF HAWAI`I [TMK: (3) 1-5-010:032]

Prepared by:
Elizabeth Pestana, B.A.
Cathleen A. Dagher, B.A.
and
Robert L. Spear, Ph.D.

FINAL
November 30, 2009

Prepared For:
John Gapp
P.O. Box 1128
Pahoa, Hawaii 96778

SCIENTIFIC CONSULTANT SERVICES Inc.
711 Kapiolani Blvd. Suite 975 Honolulu, Hawai`i 96813

ABSTRACT

At the request of the landowner, Mr. John Gapp, Scientific Consultant Services (SCS), Inc. has prepared this Burial Treatment Plan (BTP) for Sites 50-10-45-26659 and 26662 through 50-10-45-26665. The Burial Treatment Plan follows an accepted Archaeological Inventory Survey of approximately 5.59 acres of land in Maku`u Ahupua`a, Puna District, Island of Hawai`i, Hawai`i [TMK: (3) 1-5-010:032] (Clark *et al*. 2008). During the course of the survey nine sites were newly identified. The sites documented include: Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement; -26660, a Historic habitation complex; -26661, a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features.

Sites 50-10-45-26658 through -26666 have been evaluated for significance according to the established criteria for the Hawai`i State Register of Historic Places §13-275-6. All of the sites have been found to be significant under Criterion D, for information content. In addition the burial sites, Sites -26662 through -2665, have been found to be significant under Criteria E, for cultural significance.

Scientific Consultant Services, Inc. (SCS) has prepared this Burial Treatment Plan in accordance with the rules of the State of Historic Preservation Division (SHPD), Department of Land and Natural Resources (DLNR)(§13-300 HAR) to discuss the appropriate mitigation methods for Sites -26659 and -26662 through -26665. This Burial Treatment Plan has been prepared for these sites in advance of the construction of a proposed single family dwelling. This document follows the above-mentioned Clark *et al.* (2008) Archaeological Inventory Survey and focuses specifically on interim and long-term permanent preservation for Site -26659 and Sites -26662 through -26665. Site 50-10-45-26659 is being preserved at the landowner's request (Clark *et al.* 2008: 113). As Site -26659 is in close proximity to Sites -26662 through -26664, it is included in Preserve Area C, and is included in the Burial Treatment Plan.

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INTRODUCTION

At the request of Mr. John Gapp, landowner, Rechtman Consulting, LLC., conducted Archaeological Inventory Survey of an approximately 5.59-acres property in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010: 032] (Figures 1 and 2) (Clark *et al.* 2008). During the course of the survey nine sites were newly identified (Figure 3). The sites documented include: SIHP Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features. Subsequently, Mr. Gap requested Scientific Consultant Services, Inc. (SCS) prepare this Burial Treatment Plan, in consultation with the State Historic Preservation Division (SHPD). This Burial Treatment Plan has been prepared specifically for Site -26659 and Sites -26662 through -26665, in advance of the construction of a proposed single family dwelling (Figure 4). This document follows the above-mentioned Clark *et al*. (2008) Archaeological Inventory Survey and focuses on appropriate mitigation methods for State Inventory of Historic Properties (SIHP) Sites 50-10-45-26662, -26663, -26664, and -26665. As these burial sites were identified during Archaeological Inventory Survey, they are defined as "previously identified" in accordance with the rules of the State Historic Preservation Division (SHPD), Department of Land and Natural Resources (DLNR) (§13-300, HAR). Please note Site -26659 is being preserved at the landowner's request. As Site -26659 is in close proximity to Sites -26662 through -26664, it is included in Preserve Area C. Thus, Preservation measures for Site -26659 will be specifically discussed in this Burial Treatment Plan.

The purpose of this Burial Treatment Plan is to ensure that State Sites 50-10-45-26659, -26662, -26663, -26664, and -26665 will be preserved in place for perpetuity. This document has been written in accordance with the rules of the State Historic Preservation Division (SHPD), Department of Land and Natural Resources (DLNR) (§13-300, HAR).

ENVIRONMENTAL SETTING

PROJECT AREA

The project area consists of approximately 5.59-acres of land located just southeast of the Hawaiian Paradise Park residential subdivision in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010: 032] (see Figures 1 and 2). The parcel is a long, narrow rectangular shaped tract of land flanked by undeveloped parcels on its north and south sides, by the Old Government Beach Road on its west (*mauka*) edge, and the coastal setback on its east (*makai*)

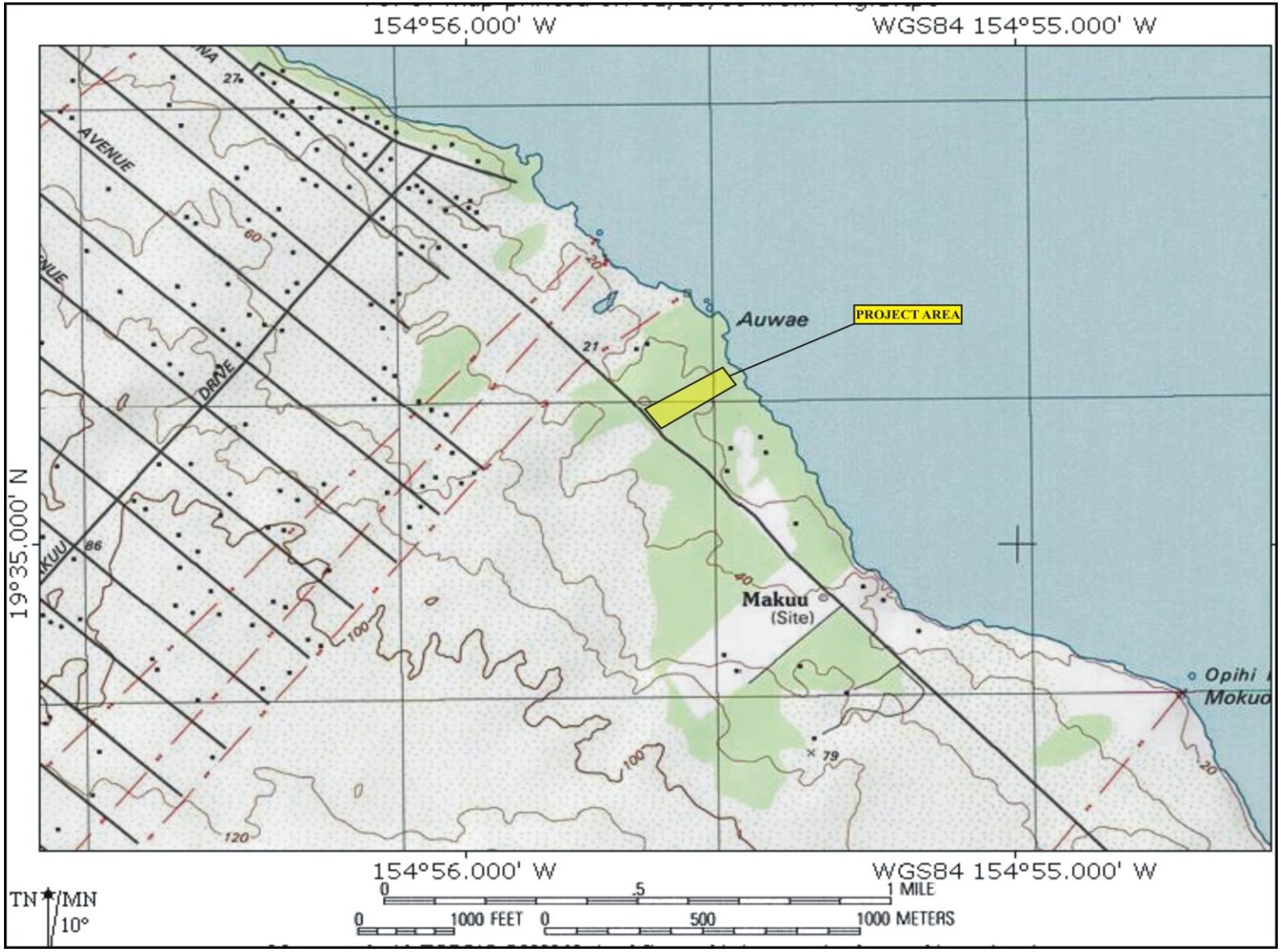

Figure 1: USGS Quadrangle (Pahoa North) Showing Project Area.

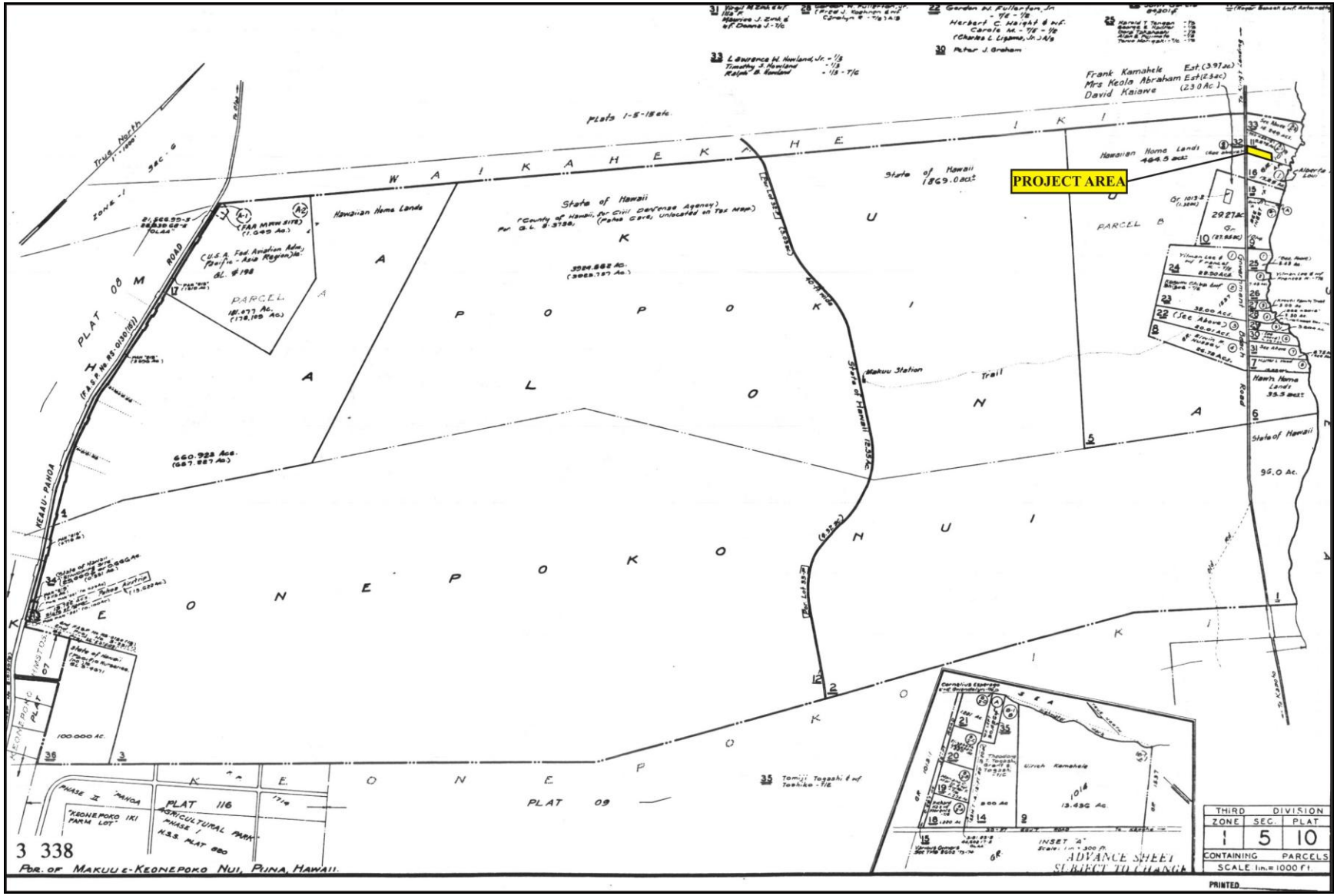

Figure 2: Tax Map Key [TMK: (3) 1-5-010:032] Showing Project Area.

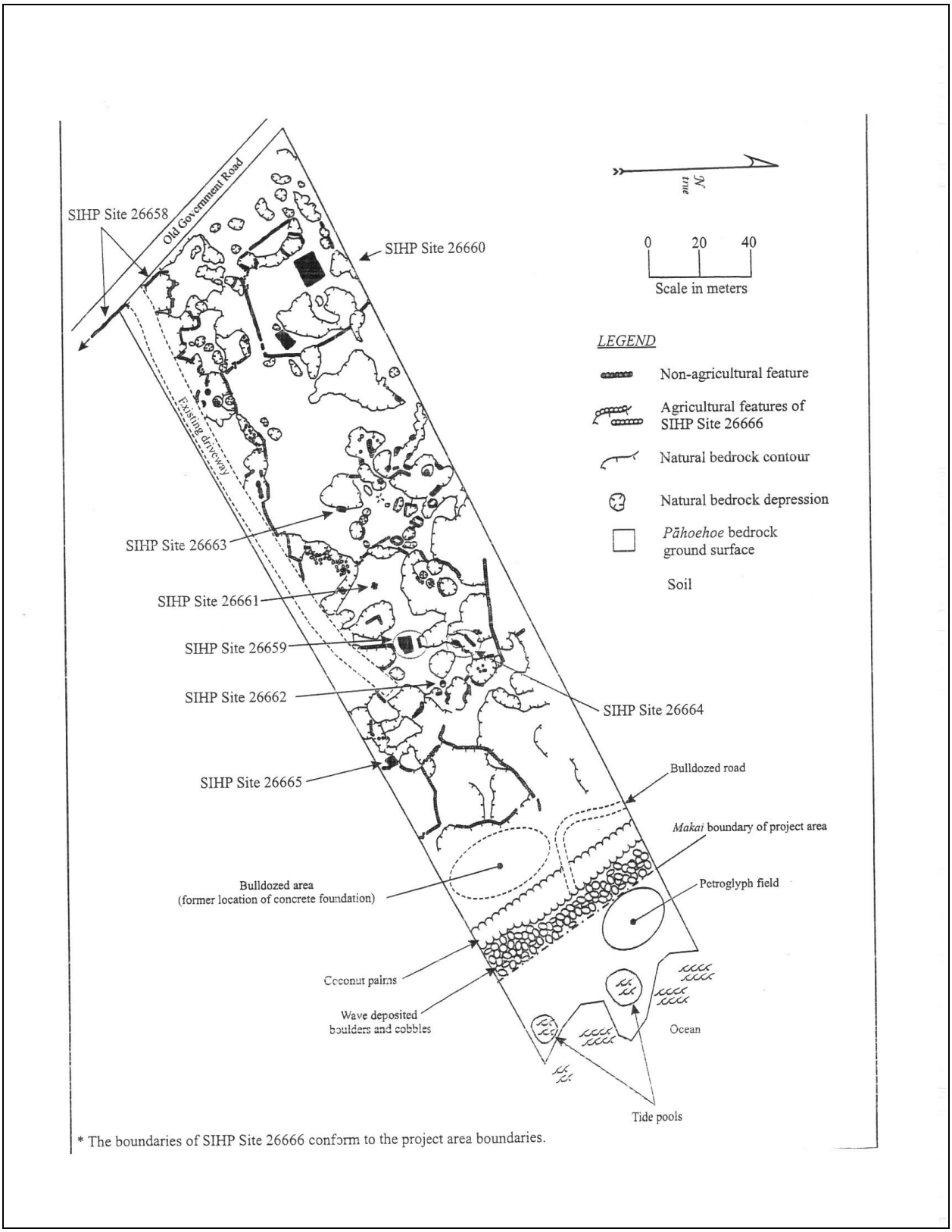

Figure 3: Plan View Map Showing Project Area and Location of Site 50-10-45-26658 through Site 50-10-45-26666 (adapted from Clark *et al.* 2008).

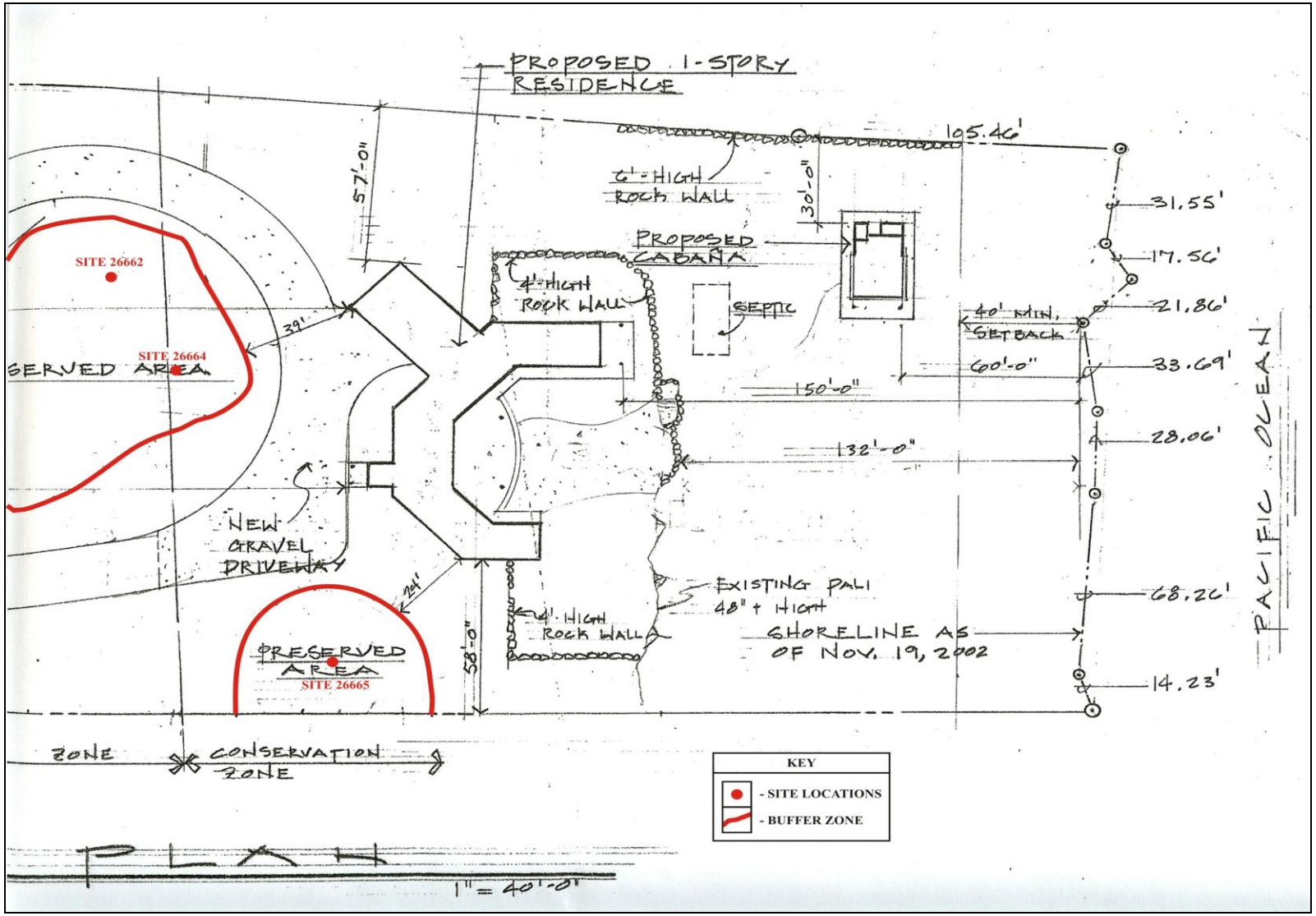

Figure 4: Schematic Plan View Map Showing Locations and Permanent Buffer Zones of Sites 50-10-45-26662, Site 50-10-45-26664, and Site 50-10-45-26665 in relationship to the location of the proposed dwelling (adapted from Clark *et al.* 2008).

edge at 0 to 40 feet above sea level. Terrain on the parcel gently slopes northeast and is comprised of *pahoehoe* lava flows of the Kilauea Volcano. A majority of the ground surface is exposed bedrock containing pockets of sediment.

CULTURAL HISTORICAL CONTEXT

THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169-70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I: 145). The Māhele of 1847-48 divided Hawaiian lands between the king, the chiefs (n*a ali‘i*), and the government beginning the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Through the Māhele of 1847-48 and the Kuleana Act of 1850, land was made available for private ownership, and the *maka`āinana* (commoners), if they had been made aware of the procedures, were also able to claim the plots on which they had been cultivating and living. If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16).

In 1848 as a result of the *Māhele*, the land of Maku‘u *ahupua‘a* was retained as Government Lands and only five LCAs or Kuleana parcels were claimed (Claim Numbers 09494, 09496, 10139, 10139B, and 11293*H) at inland locations (Waihona.com). Three of the claims (Claim Numbers 09494, 10139B, and 11293*H) were awarded. Claim 09494 was awarded to Kamali‘ikapu and was for two ‘*apana*, one of which was a house lot in Maku‘u *ahupua‘a*. The house lot was in Kalele *‘ili* and was inherited from his parents in 1819. Claim 10139B was awarded to Pu‘ulau and was for a single *‘apana* in the *‘ili* of Ililoa. The *‘apana* contained four taro fields, six sweet potato fields, two coffee fields, and a sugar cane field. Claim 11293*H was awarded to Isaaka Kaiama and was a single *‘apana* in Maku‘u *ahupua‘a*.

Coastal portions of the *ahupua`a* of Maku`u, Pōpōkī, and Hālona were eventually divided and sold as fee simple Land Grants. In 1852, a portion of the current project area became Land Grant No. 1013, Lot 1 and was acquired by D.W. Maiau (Clark *et al.* 2008). D.W. Maiau was the husband of Hanai.

HISTORICAL CONTEXT

In 1848, a survey of schools conducted by the Hawaiian Government recorded a schoolhouse in Maku`u Ahupua`a, and lists Land Grantee Maiau as the teacher, Maiau's teacher's salary, the number of students attending, and the academic curriculum. By 1873 - 1874, the Maku`u school was noted once again in a period report submitted by Puna school, which reported the same information as in the previous report including an N. Kanihoa as the Maku`u school teacher, a J. Elderts as the school supervisor, the schoolhouse as being in good condition, and the birth and deaths known to Maku`u over that period (*ibid.*).

In 1873 construction of the Government Road, likely the route of an old pedestrian trail, from Hilo through Puna had been completed. Around this time cattle ranching had found its start in the area when rancher Obed B. Spencer leased the ahupua`a of Kea`au, just northwest of Maku`u from guardians of William C. Lunalilo, Charles Kanaina and Charles R. Bishop. Spencer's ten year lease was transferred, and his personal property which included "…buildings and improvements…all [the] flocks of cattle running on the land of Keaau aforesaid and on the adjoining lands branded 'OS' or ' ' together with [the] brand 'OS' and also [the] flock of goats and sheep running on the land of Keaau aforesaid and the adjoining lands and also [the] fowls and hogs on the lands…", as stated in the assignment of the lease and Bill of sale, was sold to J.O. Dominis and R.A. Lyman.

Dominis' and Lyman's newly acquired leased lands reportedly inventoried 300 "OS" branded cattle, and 4,000 goats. Over the course of the following year, the two expanded their ranching endeavors leasing additional lands in neighboring *ahupua`a*, but by 1876 Charles R. Bishop bought Lyman's interest in the *ahupua`a* of Kea`au for $8,333.00, and in turn assigned the lease to the Hawaiian Agricultural Company in consideration of $120,000.00.

In 1877 J.E. Elderts and William H. Shipman in consideration of $33,000.00 were assigned lease and business interests in Kea`au ahupua`a by the Hawaiian Agricultural Company. Eldert's and Shipman's new partnership in ranching began to prove lucrative, and by 1879 their holdings included the majority of lands between Kea`au and Kapoho *ahupua`a* (*ibid.*).

During this time reports by the Government Schools of the Puna District had noted a deterioration in the standing of the schools of Keahou and Maku`u, due to a decline in the contribution by skilled teachers, and of income generated by the schools fields; owing to the trampling of produce by ranch animals. By 1891 the report noted that the schoolhouse in Maku`u was no longer standing, and that Kea`au school was gone (*ibid.*).

The late 1800s had begun a transformation in land use and tenure in the Puna District. Before 1900 Shipman had sole interest in Kea`au and lands of the neighboring *ahupua`a*. Approximately 4,000 acres of these lands he sold to various buyers for coffee cultivation, and leased another 4,000 acres to the Ola`a Sugar Company, Ltd. By 1900 a new highway been completed and in the early part of the 20th century radical changes in the Puna District had become evident. As ranching, sugarcane, coffee, and lumber became the dominating industries, a decline of population in the area resulted in the near disappearance of Traditional agriculture systems (*ibid.*).

PREVIOUS ARCHAEOLOGY

There have been numerous archaeological investigations in Maku`u, Pōpōkī, and Hālona *ahupua`a*. Among the previous studies, nine were conducted in the *ahupua`a's* coastal regions near the current project area, and six at locations further inland. For a more thorough discussion of the archaeology conducted in the vicinity of the current project area, please see Clark *et al.* 2008.

Among the earliest of archaeological studies in the vicinity of the project area, was an endeavor by Hudson to survey the archaeological sites from Waipio Valley to the Ka`u District of the East Hawai`i Island coast. In his attempt to survey such a length of coast, the features recorded ranged from shrines to mounds. Hudson didn't document any sites in Maku`u but only alluded to the "…mazes of old walls and occasional inclosures giving evidence of the former population and extensive cultivation of this stretch of coast" between Mokuopihi and Waihakiula (*ibid: 16*)

In 1990 Barrera conducted the first phase of a three phase archaeological study on [TMK (3) 1-1-10: 033], a 14-acre parcel adjacent the coast, northwest of the current project area. Barrera's Archaeological Inventory Survey recorded six site complexes, all with multiple component features. These sites were documented as SIHP Sites: -14675, -14981, -14982, -14986, -14984, and -14985 and included a broad range of feature types including modified outcrops, depressions, lava blisters, walls, mounds, platforms, enclosures, and terraces. The sites were interpreted as agriculture, habitation, and possible burial dating from pre-Contact to the Historic era (*ibid.*).

In the second phase of the archaeological study of the above parcel, SCS conducted burial testing (Chaffee and Spear 1993) at a mound feature of Barrera's Site -14675, as well as two platform features and a mound feature at Site -14985. Testing resulted in the documentation of three subsurface burial chambers within the two mound features, and one of the platform features. Two of the three subsurface features contained skeletal remains and grave goods dating to the Historic period. The third, lacking human remains, was interpreted as such based on the features formal characteristics.

Finally, in the parcels third phase of archaeological investigations, Data Recovery was conducted at two enclosures, a terrace, a sealed lava blister, and faced mound features of Site -14675, and at Site-14985 terrace feature (Spear *et al.* 1995). Artifacts from the excavations

included modified basalt and volcanic glass, the majority of which were recovered from the terrace feature of Site -14985. Radiocarbon dating yielded an estimated date of 349 to 59 B.P., a 2 sigma calibrated result of A.D. 1660 to 1950. The sites were interpreted as permanent habitation from the late pre-Contact to the late 19th century (*ibid.*).

A reconnaissance survey of a six mile corridor for the proposed Kapoho-Keaukaha Highway route spanning from Waiakahiula Ahupua`a to Kea`au Ahupua`a through the Puna District was conducted in 1974 by Bishop Museum (Ewart and Luscomb). The findings were extensive and consisted of several archeological sites composed of single features, and feature complexes.

Archaeological Inventory Survey conducted on a 38–acre parcel, just *mauka* of old Government Road, south of the current project area documented five sites (Clark *et al.* 2007). The sites identified ranged from pre-Contact to Historic period sites and included a pre-Contact agricultural shrine

SUMMARY OF ARCHEOLOGICAL INVENTORY SURVEY

Rechtman Consulting LLC., conducted Archaeological Inventory Survey of an approximately 5.59-acres property in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010: 032]. During the course of the survey nine sites, comprised of 67 features, were newly identified (Clark *et al.* 2008) (see Figure 3). The sites documented include SIHP Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features. For a detailed account of the findings please refer to Clark *et al.* (2008).

All of the sites identified during the survey evaluated for significance according to the established criteria for the Hawai`i State Register of Historic Places §13-275-6. The five criteria are classified as follows:

Criterion A: Site is associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B: Site is associated with the lives of persons significant to our past;

Criterion C: Site is an excellent site type; embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual construction;

Criterion D: Site has yielded or has the potential to yield information important in prehistory or history; and).

Criterion E: Site has cultural significance to an ethnic group; examples include religious structures, burials, major traditional trails, and traditional cultural places (State of Hawai`i criteria only).

Sites 50-10-45-26658 through -26666 have been found to be significant under Criterion D, for information content. In addition the burial sites, Sites -26662 through -2665, have been found to be significant under Criteria E, for cultural significance. As stated elsewhere in this document Site 50-10-45-26659 is being preserved at the landowner's request (Clark *et al.* 2008: 113).

SITE DESCRIPTIONS

A detailed description of Site 50-10-45-26659 and Sites -50-10-45-26662 through -26665 is provided below from Clark *et al.* (2008: 28-33, 52 -69).

SIHP SITE 50-10-45- 26659

Site 26659 is an enclosure/pavement located in the central portion of the study parcel; approximately 15 meters northwest of the *makai* end of the driveway [see Figure 3]. It is situated at the top of a raised, linear section of bedrock that drops off steeply to the north and south of the feature. The site consists of a level cobble pavement on bedrock with an enclosure constructed on the surface of the pavement. The base pavement of Site 26659 measures 7.0 meters (east/west) by 5.4 meters (north/south). It is a level surface constructed on south-sloping bedrock. The exterior edges of the pavement consist of stacked basalt cobbles standing one to three courses (35-60 centimeters) above the bedrock ground surface. The down-slope (southern) edge of the pavement is taller than the upslope (northern edge). The level surface of the pavement consists of jumbled, small to medium sized cobbles. The surface was likely more neatly paved at some point in the past, but root disturbance from nearby rose apple and mango trees has caused many of the cobbles to shift.

The surface of the southern portion of the pavement is enclosed with stacked rock walls. The enclosed area measures 6.3 meters long by 3.0 to 4.5 meters

wide. The eastern portion of the enclosure is generally in a better state of repair than the western portion, which has collapsed onto the surface of the pavement. The western wall segment measures 3.2 meters long by 1.1 meter wide and stands 30 centimeters above the pavement's surface. The eastern wall measures 2.5 meters long by 1.0 meter wide and stands up to 75 centimeters above the surface of the pavement. The southern wall segment is rough and has mostly collapsed, but in its current condition it measures 5.0 meters long by 0.4 to 1.5 meters wide (due to the collapse its height above the surface of the pavement is difficult to determine). The northern wall segment measures 6.2 meters long by 1.0 meter wide and stands 30 to 65 centimeters above the surface of the pavement. There is a 50-centimeter wide gap in the center of the northern wall that, although somewhat collapsed, appears to be an intentionally constructed entryway to the enclosure from the northern portion of the pavement. The enclosed area may have supported a structure with a roof and walls. The northern portion of the pavement is not enclosed [Figure 4]. It measures 7.0 meters long by 2.0 meters wide, and as mentioned above, has a jumbled surface. The roots of two large rose apple trees have severely impacted the northeastern corner of this portion of the pavement.

A possible posthole was noted in the northwest corer of this area. The posthole is roughly circular, and lined with large sized cobbles. It measures 40 centimeters in diameter by 30 centimeters deep. The posthole may have held a roof support upright. This portion of the feature may have been a covered *lanai* area, and acted as the entryway to the enclosed portion of Site 26659.

A 2.7-meter long by 0.9-meter wide alignment is located 2.0 meters northwest of the northern edge of the pavement. The alignment consists of two courses of stacked cobbles that stand up to 40 centimeters above ground surface to the north. Bedrock slopes away from the base of the alignment to the south to a soil filled depression, but the top of the alignment is even with ground surface to the south. This alignment helps create a level surface between it and the pavement, again suggesting a possible entryway along the northern side of the pavement. Level, unmodified bedrock continues to both the east and the west away from Site 26659, providing the easiest pedestrian access to the site from those directions (*ibid.*). Sites 50-10-45-26659 has been found to be significant under Criterion D, for information content

Sites 50-10-45 -26662 through -26664, a series of Historic concealed overhangs containing burials, and Site 50-10-45-26665, pre-Contact a platform burial, are described in detail below. No items were removed during test-excavations at these sites and all cultural material within the burials will remain with them in perpetuity. Please note the following site descriptions are those provided in Clark *et al*. 2008.

SIHP SITE 50-10-45- 26662

Site 50-10-45-26662 is a concealed bedrock overhang located in the east-central portion of the project area, 20 meters northeast of Site -26659. The site consists of a wall constructed along the edge of a natural bedrock depression that blocks and

conceals an overhang. The roughly oval depression measures 3.2 meters by 2.0 meters by 1.0 to 1.4 meters deep. It has vertical bedrock edges and thin soil at its base. The overhang and wall are located along the *mauka* (southwestern) edge of the depression. The wall is constructed of medium to large sized cobbles and boulders that are stacked five courses high. The wall measures 3.25 meters long by 0.6 to 0.8 meters wide and stands 1.25 meters tall from the floor of the depression to the bedrock at the top of the overhang. A large rose apple tree is growing on top of the wall, and its roots extend down into the feature. A 1.3-meter long portion of the wall at the southeast end is constructed under overhanging bedrock. Small voids between the cobbles of the wall allowed for glimpses into a chamber created by a bedrock overhang behind it. A smaller bedrock depression (1.0 meter long by 0.5 meters wide by 1.25 meters deep), located 1.0 meter to the west of the larger one, also had some cobbles loosely stacked/piled along its southeastern edge that appeared to block another opening to the same overhang. In an attempt to access the overhang chamber, a 1 x 1 meter test unit (TU-2) was excavated on top of the central portion of the wall along the south edge of the bedrock depression. Excavation of TU-2 began with removal of the wall cobbles and boulders to a depth of 1.0 meter, which was adequate to allow fieldworkers to access to the overhang chamber. The concealed chamber measured 2.5 meters long (northwest/southeast) by 1.6 meters deep, and had interior floor to ceiling heights that ranged from 0.7 to 1.2 meters. The floor of the chamber consisted of black (10YR 2/1) muck; some exposed bedrock, tree roots, and scattered cobbles from interior wall collapse.

Three Historic artifacts were discovered within the wall construction during the removal of the cobbles: a hard rubber ovoid object, a metal disc, and a metal buckle assembly. The hard rubber object measures 6 x 4 centimeters. It has two small holes and the inscription "Horn's Standard Fig. 9" on its flat side. The metal disc is round and flat, measures 4.5 centimeters in diameter, and is shiny on one side and rusted on the other. The metal buckle assembly measures 10 centimeters long by 4 centimeters wide, and was riveted to allow for rotational movement and adjustment. Together these objects appear to represent elements of a hernia truss that may have been manufactured by Horn and Bro., W. H. prior to the turn of the 20th century. An internet search found an 1892 catalogue listing for Horn and Bro., W. H. that contained reference to Horn's standard hard rubber, leather covered and elastic trusses. This listing is contained in the Ottis Historical Archives of the National Museum of Health and Medicine (HTTP:// nmhm.washingtondc.museum).

Several more Historic artifacts including a branding iron, two ceramic bottles, and an ornate metal latch attached milled wood were discovered on the floor of the overhang chamber. The first of these artifacts is a salt glazed gin jug manufactured by Blankenheym and Nolet of Holland. The bottle has a broken "ear" handle, but is otherwise intact. It is burnt sienna in color and embossed with the "Blankenheym & Nolet" maker's mark on the body. The jug measures 30 centimeters tall by 11.5 centimeters wide at its round base. It was discovered on

the floor of the southwestern portion of the overhang. A second jug, nearly identical to the first, was discovered within the northern portion of the overhang. This jug is completely intact, and it has the marking “2 KAN” inscribed within a circle on its shoulder. It also measures 30 centimeters tall by 11.5 centimeters wide at its round base. Bottles of this type were typically manufactured between 1850 and 1920 for gin. The majority of the jugs originated in Holland, but some were also produced in Germany. It was not uncommon for these jugs to be reused over time for the storage of other liquids such as fresh-water or homemade spirits.

The third artifact discovered within the overhang was an ornate, metal latch attached to a piece of decomposing, milled wood. It was discovered on the northwestern portion of the floor within the overhang. The latch is made in two pieces of a gold colored metal with intricate scroll work. The first piece is thin and flat and attached to the wood. It measures 6 centimeters long by 3 centimeters wide. The second piece protrudes from the center of the first at a right angle. It measures 3 centimeters by 3.5 centimeters, and has a round stem that attaches to the first piece. Although currently stuck in place, it appears as though this second piece used to turn. It was likely part of a latch on a wooden box or coffin.

The last artifact, discovered in the southwestern portion of the overhang against the bedrock edge, was a branding iron of the type used to brand cattle. The branding iron is manufactured of wrought iron. It has an overall length of 60 centimeters with an attached ring at one end and the brand at the other end. The ring, presumably to hang the iron for storage, measures 4.5 centimeters in diameter. The brand itself measures 9.5 centimeters wide at the base by 13.0 centimeters tall. It is in the shape of a stylized “P.

Based on the concealed nature of the overhang and the presence of personal items within it, Site 26662 is interpreted as a late nineteenth century grave, with the burial either located in the soil of the overhang floor or the remains having since disintegrated. Following discovery of the items within the concealed chamber, and to limit further disturbance to this presumed burial feature, excavation of TU-2 ceased, the items were returned to their discovered locations, and the concealing wall was rebuilt as close to its original specifications as possible. Site 26662 is nearly identical in appearance to Sites 26663 and 26664 within the current project area, which also contained Historic Period items and were interpreted as burial features (Clark *et al*. 2008: 52, 57).

SIHP SITE 50-10-45- 26663

Site 50-10-45-26663 is a concealed bedrock overhang located in the east-central portion of the project area 32 meters west of Site 26661. The site consists of a stacked wall constructed along the edge of a natural bedrock depression that blocks and conceals an overhang. The wall and overhang are situated along the northern (*makai*) edge of a large, natural depression in the bedrock ground surface. The irregularly shaped depression measures 15 meters in diameter and is by 1.5 to 2.0 meters deep. It has vertical bedrock edges and thin soil at its base.

The wall is constructed of medium to large sized cobbles and boulders that are stacked four to five courses high along the edge of the depression.

It is slightly curved, measuring 3.5 meters long by 0.5 meters wide by 1.0 to 1.2 meters tall. The northeastern end of the wall (0.8 meters long) is constructed beneath a shallow bedrock overhang. A 1.2 meter wide area between the wall and the exposed bedrock edge of the depression has been filled with cobbles. The surface of the fill is 20 centimeters below the top of the wall and 30 to 40 centimeters below ground surface outside the depression. It is covered with organic debris and thin soil. A large mango tree is growing at the southwestern end of the wall within the depression. The formal attributes of Site -26663 closely resembled those of Sites -26662 and -26664. For this reason, to test for the possibility of a concealed chamber and the presence of human skeletal remains, a 1 x 1 meter test unit (TU-5) was excavated at the northeastern end of the site into the fill material along the southeastern edge of the wall. Excavation of TU-5 began with the removal of the architectural layer (Layer I) of surface and wall cobbles adjacent to the bedrock edge. In order to preserve the structural integrity of the feature, the outward facing (northwest) edge of the wall was left intact. The architectural layer consisted of medium to large sized cobbles and a single small boulder. No soil was present within the layer, only decaying organic debris on the surface of the unit. At a depth of 125 centimeters below the surface of the unit a void was discovered along the southeastern edge of the feature that revealed the presence of a single sheet of flat-laid, corrugated iron roofing on ground surface between the interior edge of the wall and the bedrock edge of the overhang. The corrugated roofing material could not be lifted or removed with out destroying of the entire feature. Based on previous, similar discoveries at other locales on the Island of Hawai‘i (Clark and Rechtman 2003, 2004), along with the findings at Sites 26662 and 26664 within the current project area, it was strongly suspected that the corrugated iron covered a Historic burial. At this point, for this reason, excavation of TU-5 ceased, and the feature was rebuilt as close to its original specifications as possible. With the exception of the corrugated iron, no other cultural material was observed during the excavation of TU-5.

SIHP SITE 50-10-45- 26664

Site 50-10-45-26664 is a concealed bedrock overhang located in the east-central portion of the project area 18 meters north of Site 26659. The site consists of a stacked wall constructed along the southwestern edge of a large, natural bedrock depression that blocks and conceals an overhang. The wall, which measures 3.5 meters long, is largely collapsed along its exterior edge. The northeastern end retains some intact, vertical stacking of large sized cobbles that stands five courses (1.2 meters) tall. This section of the wall is approximately 0.7 meters wide, and it retains some level cobble fill (roughly 0.7 meters wide) between it and the bedrock edge of the depression. The remainder of the wall, although it was once likely stacked, slopes downward to the west from the upper edge of the bedrock depression to ground surface within. In this collapsed state the wall measures 1.7 meters wide. The collapsed cobbles revealed the presence of the concealed bedrock overhang to the southeast of the wall. Voids between the

cobbles allow for glimpses of a chamber within. By temporarily moving two cobbles on top of the southwest end of the wall, fieldworkers were able view the interior of the chamber, but not access it. From that vantage point the presence of a single sheet of corrugated iron roofing laid flat on ground surface, between the interior edge of the wall and the bedrock edge of the overhang, was noted, along with what appeared to be a metal handle of some sort, and possibly a long bone from an adult human. These items could not be reached without further rock removal at the feature, so they were left untouched and unexamined. Instead, the two cobbles moved from the top of the wall were replaced and arranged to better conceal the opening. It was noted, however, that the interior edge of the wall concealing the overhang was neatly stacked.

Based on previous, similar discoveries at other locales on the Island of Hawai`i (Clark and Rechtman 2003, 2004), the findings at Sites 26662 and 26663 within the current project area, and the presence of what appeared to be human skeletal remains within the concealed overhang at Site 26664, it is strongly suspected that the corrugated iron covers a Historic burial. Site 26664 is very similar in appearance to both Sites 26662 and 26663. One difference between this site and the other two sites, is that two wall sections constructed nearby appear designed to define and protect the burial area. This is likely due to the location of Site 26664 within a larger, less well defined depression than the other two burial sites. At sites 26662 and 26663 the vertical walls of the depressions would have acted as natural barriers to intruders, but at Site 26664 the vertical bedrock only protects the site along its eastern and southern edges, and a portion of its northern edge. A free-standing wall is present to the west of the concealed overhang, blocking access from that side, and cobbles stacked against bedrock are present to the northeast of the concealed overhang, helping to control access from the northern end of the site.

The wall to the west of the concealed overhang is located 4.5 meters distant. It is stacked and core-filled, standing 0.7 to 0.8 meters (three to four courses) tall by 0.5 to 0.7 meters wide. The wall runs northeast/southwest for nearly 8.0 meters. The area between this wall and the concealed overhang consists of cobble and boulder rubble. Ground surface to the west of this wall consists of thin soil that has collected within the large bedrock depression. A few large rose apple trees are growing on top of this wall.

The wall to the northeast of the concealed overhang is stacked on and against the bedrock edge of the natural depression. This wall measures 3.0 meters long by 0.5 to 0.6 meters wide. It follows the northeast/southwest running edge of the depression, and stands 0.6 to 1.3 meters above ground surface within the depression, but its top is level with ground surface outside the depression. The wall is constructed across (blocking) an area of somewhat gently sloping bedrock that would have allowed for the easiest access to the concealed overhang area from that direction (Clark *et al* 2008: 61, 67).

SIHP 50-10-45-26665

Site 50-10-45-26665 is a platform located in the southeastern portion of the project area along the southern property boundary. The platform, which is roughly rectangular, measures 3.1 meters by 3.5 meters and is stacked 1.0 to 1.1 meters on the east side. The eastern edge is composed of medium to large sized cobbles stacked five to six courses high. A single large boulder is present in the north corner of this wall. At the southern corner, the face of the platform bends around to the southeast and begins to climb a natural bedrock ridge. The height of the stacking decreases to 60 centimeters with cobbles stacked two to three courses high. A single course cobble alignment runs to the southeast away from the south corner of the platform for approximately 3.8 meters following a natural bedrock contour. The western portion of the south side of the platform is not stacked as high due to a natural rise in the bedrock. The southwest corner consists of a single course of cobbles standing 40 centimeters in height. Two large rose apple trees are growing on bedrock along this edge, and their roots have slightly impacted the feature. The west side of the platform is similar to the east. It consists of medium to large sized cobbles stacked five to six courses (up to 1.4 meters) high. The northwest face of the platform stands 80 to 90 centimeters in height and consists of three courses of large cobbles and boulders. Another large rose apple tree is growing on top of this edge, and its roots have also impacted the feature. The surface of the platform is level and paved with small to medium sized cobbles covered by organic debris.

To test for buried cultural deposits, and to aid in feature interpretation, a 1 x 1 meter test unit (TU-6) was excavated in the central portion of the platform's surface. The surface of the unit consisted of leaf litter, moss, and ferns covering the level cobble paving. Excavation of TU-6 revealed an architectural layer (Layer I) composed of small cobbles near the surface and larger cobbles beneath. Several waterworn cobbles were also noted in the construction. The size of the cobbles in Layer I generally increased with depth. At a depth of 70 centimeters beneath the surface of the unit what appeared to be bedrock was observed in the north, south, and west walls of the unit, but the architectural layer continued in the center of the unit. At a depth 180 centimeters beneath the surface of the unit, a large boulder was encountered within TU-6 that could not be removed without further excavation at Site 26665. The boulder appeared to be blocking a lava blister that measured 30 centimeters tall from floor to ceiling and ran to the southwest toward the raised bedrock along that side of Site 26665. The floor of the blister consisted of dark reddish brown (5YR 3/2) silt and the ceiling of *pāhoehoe* bedrock. The soil was also present beneath the boulder.

At this point, due to the presence of the boulder (to remove the boulder would have required opening up one or two more test units, and in the process nearly completely destroyed Site 26665), excavation of TU-6 ceased. A profile drawing was prepared and the unit was photographed. All material excavated from Site 26665 was then returned to the unit as close to its original specifications as possible. No cultural material was recovered during the excavation of TU-6.

However, based on the formal attributes of the platform (neatly stacked, tall edges with a paved surface), the lack of habitation debris at the site, the presence of numerous waterworn cobbles within the architectural layer and the boulder blocking the blister at the base of TU-6, it is strongly suspected that Site 26665 was constructed as a burial monument during Precontact times. It is likely that human remains were interred within a natural lava blister at the location of Site 26665, that the blister opening was then blocked with a boulder, and the platform was constructed over the interment (Clark *et al*. 2008:68, 69).

BURIAL TREATMENT AND PRESERVATION

The following text provides interim and permanent preservation measures for Sites 50-10-45-26659, -26662, -2663, -26664, and -26665. As discussed elsewhere in this document, Site -26659 is being preserved at the landowner's request. As Site -26659 is in close proximity to Sites -26662 through -26664, it is included in Preserve Area C. Thus, Preservation measures for Site -26659 will be specifically discussed in this Burial Treatment Plan.

INTERIM PROTECTION

Short-term preservation measures at Sites -26659, -26662, -2663, -26664, and -26665 will include the delineation of an interim buffer zone of no less than 20.0 feet (6.0 m) (Figure 5).

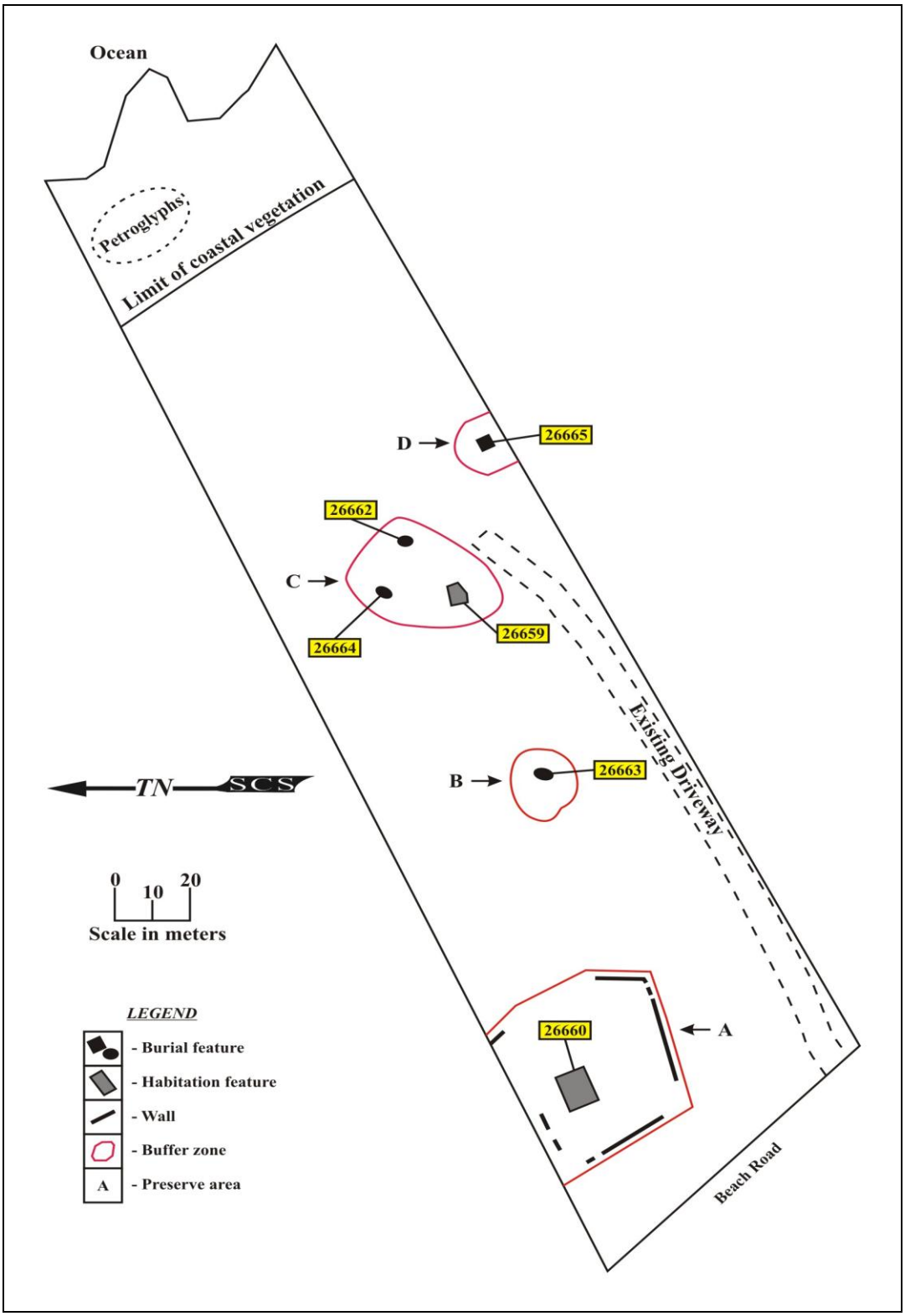

Figure 5: Plan View Map Showing Locations and Permanent Buffer Zones of Sites 50-10-45-26659, 50-10-45-26662, 50-10-45-26663, 50-10-45-26664, and 50-10-45-26665 (adapted from Clark *et al.* 2008).

This interim buffer zone will be established from the outer edges of all archaeological features comprising Sites -26663 (Preservation Area B), -26665 (Preservation Area D), and the perimeters of Preservation Area C (see Figure 5). Prior to the start of any construction work within the project area, orange construction fencing will be erected along the interim preservation zones of Sites -26663, -26665, and the perimeters of Preservation Area C (see Figure 5). The landowner will place an informative sign in a prominent position along the orange fence line stating that graves are present and to keep out. The construction crew will be instructed about the meaning of the fencing and the significance of the preserve area prior to the start of the construction work. It is the landowner's responsibility to maintain the site and the orange fence line during all phases of project area construction.

PROPOSED TREATMENT AND PRESERVATION

It is proposed herein, and described further below, that the above-described sites will be preserved in place.

PERMANENT PRESERVATION MEASURES

The habitation structure at Site 50-10-45-26659 and the human remains identified at Sites 50-10-45-26662, -26663, -26664, and -26665, Maku`u Ahupua`a, Puna District, Hawai`i will be preserved in place. The locations of Sites 50-10-45-26659, -26662, -26663, -26664, and -26665 have been plotted with a hand-held Global Positioning System (see Figure 3). At the landowner's request and given the close proximity of these sites, Site -26659 will be preserved together with the burials at sites -26662, and -26664 within the confines of a single preservation area (Preservation Area C) measuring approximately 40 meters (north-south) by 30 meters (east-west) which will include a 20 foot buffer from the outer edges of each of the sites (see Figure 5). This information will be on file with the Department of Land and Natural Resources Bureau of Conveyances. Based on a discussion with the State Historic Preservation Division, a 20.0 foot (6.0 m) protective buffer has been established around the perimeters of Sites 50-10-45-26663 and -26665, to protect them from future disturbance (see Figure 4). In addition to the preservation buffer zone, an additional 10 foot "no build zone" has been established for Site -26659 and Sites -26662 through -26665. The "no build zone" shall extend an additional 10.0 feet from the exterior boundary of the established preservation zone of Sites -26663 and -26665 and for Preserve Area C. Thus, no structures, pools, overhangs, etc. may be built within 10 feet of the permanent buffer of Sites -26659, -26662, -26663, -26664, and -26665.

Ti plants (no trees) and a rock wall shall be placed on the ground surface to delineate the outer boundary (buffer) of the preservation areas. No disturbance to the ground surface, excepting manual planting (or hand tools) and maintenance of shallow rooted native plants (ti plants), shall occur within the aforementioned protective buffers (see Appendix C for property botanical study). The Lui family (recognized cultural descendants) expressed that the rock wall will be sufficient to delineate the buffer around the burials, and the ti plants will be appropriate. The preservation and mitigation measures for Site 50-10-45-26660 were prepared under separate cover in (Pestana, Dagher, and Spear 2009) *A Preservation Plan for Site 50-10-45-26660, Located On A 5.59-Acre Parcel In Maku`u Ahupua`a, Puna District Island of Hawai`i [TMK: (3) 1-5-010: 032]*. The preservation plan was approved by SHPD (May 5, 2009).

Signs shall be placed in prominent places at Preservation Area B, Preservation Area C, and Preservation Area D. The signs will read in Hawaiian language and English "Mai ka hikina a ka lā i Kumukahi a ka welona a ka lā i Lehua. E hoʻomaha me ka maluhia." "From the sunrise at Kumukahi to the sunset at Lehua. Rest in Peace." The Lui family (recognized cultural descendants) believe that the text will be appropriate and sufficient to denote the presence of burials.

The following additional measures will be carried out to provide the maximum preservation and conservation within the context of the proposed construction activities:

1. All *in situ* burials (Sites -26662 through -26665) and Site -26659 have been preserved in place. Site 50-10-45-26659 and Burial Sites -26662, -26663, -26664, and -26665 have been permanently protected by the above-described protective buffers. Sites 50-10-45-26662, -26663, -26664, and -26665 occur far removed from any infrastructure and are protected by shoreline set back rules.

2. If any subsurface work is required during additional construction or maintenance on the property, no excavations will be allowed to proceed until orange construction fencing has been erected along the periphery of the established buffer zones around Sites 50-10-45-26663 and -26665 and Sites -26659, -26662, -26664, and -26659, which are being collectively preserved in Preserve Area C, as described above. The locations of Sites 50-10-45-26659 and -26662 through -26665 have been verified through GPS and professional survey, and are noted on all construction maps for the property. This provision is binding for any excavations on the parcels in the future.

3. Landscaping with native Ti plants shall occur around Sites 50-10-45-26659, 26662, -26663, -26664, and -26665 (Appendix C). Ti plants, and no trees, deeply rooted, or invasive plants will be allowed on the burial features or within 10 feet of Sites 50-10-45-26659, -26662, -26663, -26664, and -26665.

4. Interim and long-term preservation will ensure that the integrity and context of Sites -26659, 26662, -26663, -26664, and -26665 are preserved. Demarcations of the locations of Sites 50-10-45-26659, 26662, -26663, -26664, and -26665 have been duly recorded by the client's surveyors (see Figure 5).

5. No heavy equipment or other construction-related machines or materials will be allowed to be moved or stored within 50 feet of Sites -26659 and -26662 through -26665. The above-mentioned sites shall not be used as staging and/or storage areas.

6. Should storm surge, earthquake, or other natural or cultural damage occur to Sites -26659 and -26662 through -26665 and their environs, and should this necessitate repairs, the landowner or their representative will notify SHPD of the situation and reach an agreement with the SHPD on how to proceed prior to implementing any alterations to the ground surface, sites, or adjacent vegetation.

7. Modern debris that might be blown onto the Sites 50-10-45-26659, -26662, -26663, -26664, and -26665 may be removed by hand whenever is deemed necessary by the landowner or their representatives. The grounds must be checked on a regular basis to clear any debris from the sites.

8. If the landowner or their representatives find that Site -26659, the burial areas, or the burial structure has been disturbed in any way, they are to immediately notify the SHPD. Repairs or stabilization of any damage to the sites cannot proceed until directed to do so by the SHPD.

9. This document shall be made part of the binding agreement for the aforementioned property on which Sites 50-10-45-26659, -26662, -26663, -26664, and -26665 occur. Any final construction plans, and all future construction plans, must incorporate this plan to maintain preservation of these sites.

10. A provision is made for on-going preservation of Sites 50-10-45-26659, -26662, -26663, -26664, and -26665, with the preservation provisions being binding on successive owners of the parcel.

11. This document shall be made part of the binding title agreement for the land parcel known as TMK: (3) 1-5-010: 032 and this document will be listed with the property deed as an encumbrance. This document shall also be registered with a map that has metes and bounds descriptions of the burial locations and the burial structure. This map will be registered with the State of Hawai`i Bureau of Conveyances within 60 days of receipt of written approval of this plan by DLNR-SHPD. Once Sites 50-10-45-26659, -26662, -26663, -26664, and -26665 have been registered with the Bureau, copies of the official document shall be submitted to SHPD and the Hawai‘i Island Burial Council.

ACCESS AND LOT OWNER DEEDS

Access to all burial locations will be made available to lineal and cultural descendants seven days a week by contacting the land owner. Parking is available along Beach Road. All of the burial sites can be accessed from the driveway which passes very near to them. The lot owner will be made aware that access to burial locations is required per the agreements set forth in this Burial Treatment Plan. Any disputes over who has access to the burial areas will be handled in consultation with the HIBC, SHPD, and the land owner and its successors and assigns.

PRESERVATION VERIFICATION

Verification that interim preservation measures are in place will be made by SCS prior to the construction start date. In addition, verification that permanent preservation measures are in place will be made by SCS following completion of the development project. Verification will take the form of written notification to SHPD by SCS.

CONSULTATION

In accordance with HRS § 13-300, we have consulted with Charles Young, Chair of the Hawai`i Island Burial Council, Dutchie Saffrey, Puna District Representative of the Hawai`i Island Burial Council, and Lukela Ruddle, Hilo District representative of the Office of Hawaiian Affairs indicating SCS was initiating the consultation process and to inquire if they were aware of any individuals or group who have knowledge pertaining to the history of these sites. The consultation period extended from February 9 to April 9, 2009.

On February 13, 2009, we initiated the consultation process by sending letters to individuals and organizations that may be aware of individuals or other organizations of the Puna District and Hawaiian community who may have knowledge of the history of the project area (Appendix A). These organizations and individuals include: Charles Young, Hawai`i Island Burial Council Chair; Dutchie Saffrey, Hawai`i Island Burial Council Puna District Representative, and Lukela Ruddle, Office of Hawaiian Affairs, Hilo District Representative.

On February 24, 2009, SCS conducted a follow-up telephone call to Mr. Charles Young. Mr. Young indicated he had not received the consultation letter as he had not gone to the Post Office box. During the telephone conversation with SCS, Mr. Young recommended discussing the mitigation measures with the State Historic Preservation Division (SHPD), Hilo.

Based on this recommendation, SCS contacted Ms. Morgan Davis, SHPD Assistant Hawai`i Island Archaeologist via telephone and e-mail regarding the preservation methods at Sites -26662 through -26665. During this conversation indicated the Ms. Davis indicated the Hawai`i Island Burial Council has been requesting an additional 10 foot “no build zone” be established, in addition to the established 20 foot buffer zone of the burial sites. The “no build zone will extend an additional 10.0 feet from the exterior boundary of the established preservation zones. In addition, Ms. Davis agreed to discuss the above-described preservation measures with Analu Josephides, SHPD Cultural Historian.

On February 26, 2009 we contacted Lukela Ruddle (Office of Hawaiian Affairs, Hilo District Representative) via telephone as a follow-up to our letter. Ms. Ruddle had received the letter and apologized for not responding. During the telephone conversation with SCS Ms. Ruddle requested we send a copy to Kai Markell, Office of Hawaiian Affairs, Honolulu. We complied with Ms. Ruddle’s request and sent a consultation letter to Mr. Markell.

We did speak briefly with Dutchie Saffrey via telephone, on February 26, 2009, and were able to verify receipt of the consultation letter. Ms. Saffrey also apologized for not responding. However, due to a faulty connection, the call was disconnected and repeated attempts to reach Ms. Saffrey by phone only reached her answering machine. As Ms. Saffrey had indicated in our brief conversation that she had been having technical difficulties with her phone, SCS left a voice-message on Ms. Saffrey's answering machine with an SCS e-mail address.

On March 4, 2009, Scientific Consultant Services conducted a follow-up telephone call to Kai Markell. Initially, Mr. Markell did not answer and a voicemail was left on his answering machine. In a subsequent telephone call to Mr. Markell the same day, we were able to reach him. During the ensuing conversation, Mr. Markell stated he did not receive a copy of the consultation letter we mailed on February 26, 2009. So, we transmitted the consultation letter and the five associated figures electronically to him on March 4, 2009. He indicated, via e-mail, that he had received the letter and figures.

In addition, Scientific Consultant Services posted a notice pertaining to the findings of the four burials requesting comment and participation from any recognized lineal or cultural descendants. The item was published in both the *Honolulu Advertiser* (February 22, 25, and 26, 2009), Hawaii Tribune- Harold (February 22, 25, and 26, 2009) newspapers (Appendix B). A one-month (30 day) period was maintained to provide an opportunity for descendants (lineal and/or cultural) to the newspaper notices to come forward. There were no responses for the posted notices.

On October 27, 2009 SHPD recognized cultural descendant Ms. Nicole Lui , her father Joe, and her mother Agnes visited the property and met with SCS and the land owner. Ms. Lui had been given a copy of the BTP prior to coming to the property. Ms. Lui and her parents viewed the burial sites and discussed the preservation treatments. They expressed that the measures presented in this version of the BTP are acceptable.

RECOMMENDATIONS

Due to the presence of human burials identified during Archaeological Inventory Survey of TMK: (3) 1-5-010:032 a program of Archaeological Monitoring is recommended during all construction related ground altering activities conducted on the subject property.

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APPENDIX A: EXAMPLE OF CONSULTATION LETTER

(NO ATTACHMENTS)

February 13, 2009

Rechtman Consulting, LLC recently conducted an Archaeological Inventory Survey of a 5.586 acre property located in Maku`u Ahupua`a, Puna District, Island of Hawai`i [TMK: (3) 1-5-010:032] (Figures 1 and 2). During the course of the survey nine sites were newly identified (Figure 3). The sites documented include: SIHP Sites 50-10-45-26658, a Historic ranching (core-filled) wall; -26659, a Historic habitation enclosure/pavement;-26660, Historic habitation complex; -26661 a Historic modified bedrock hole used for water catchment; Sites -26662 through -26664, consist of a series of Historic concealed overhangs containing burials; -26665, pre-Contact a platform burial; and -26666, a pre-Contact/Historic agricultural complex comprised of 55 features. For a detailed account of the findings please refer to (Clark *et al.* 2008) An Archaeological Inventory Survey of TMK: 3-1-5-010:032, on file at the State Historic Preservation Office, Hilo.

We are now in the process of preparing a Burial Treatment Plan for the four burial sites, preserving these sites in place for perpetuity, and a Preservation Plan specifically focusing on interim and long-term, permanent for Sites -26659 and -26660. In compliance with the DLNR/SHPD Hawaii Revised Statutes (HAR) §13-277 and §13-300, we are consulting with individuals and groups who may have knowledge of the history of this area. We are writing to you to inquire if there are any contacts, of whom you may be aware, who have knowledge pertaining to the history of these sites.

Thank you in advance for your comments and help. We look forward to hearing from you.

Sincerely,

Cathleen A. Dagher
Senior Archaeologist
Scientific Consultant Services, Inc.

Attachments:

Figure 1: USGS Quadrangle (Kilohana) Map Showing Project Area.
Figure 2: Tax Map Key [TMK: (3) 1-5-010:032] Showing Project Area.
Figure 3: Site Location Map.

APPENDIX B: LEGAL NOTICE

10 11

AFFIDAVIT OF PUBLICATION

State of Hawaii)
) SS:
County of Hawaii)

LEILANI K. R. HIGAKI, being first duly sworn, deposes and says:

1. That she is the BUSINESS MANAGER of HAWAII TRIBUNE-HERALD, a newspaper published in the City of HILO, State of Hawaii.

2. That the " PUBLIC NOTICE...human remains...located in Maku'u Ahupua'a, Puna District, Island of Hawai'i, Hawai'i...etc., ".

of which a clipping from the newspaper as published is attached hereto, was published in said newspaper on the following date(s) February 22, 25, 26, 2009, (etc.).

297713

Leilani K. R. Higaki

Subscribed and sworn to before me
this 6th day of March, 2009.

Sharon H. P. Ogata

SHARON H. P. OGATA
Notary Public, Third Circuit, State of Hawaii
My commission expires October 1, 2012

Page(s): 1

PUBLIC NOTICE

Notice is hereby ~~given that~~ human remains were documented during Archaeological Inventory Survey of a property located in Maku'u Ahupua'a, Puna District, Island of Hawai'i, Hawai'i [TMK: (3)1-5-010:032]. The parcel is a portion of former Grant No. 1013, issued to D. W. Maiau in 1852.

Three of the unmarked burial sites are presumed to date to the Historic Period and one site is presumed to contain Traditional Native Hawaiian remains. Proper treatment shall occur in accordance with Chapter 6E, Revised Statutes, Section 43.5 regarding unmarked grave sites. The final disposition of the burials shall be made by the State Historic Preservation Division – Burial Sites Program in consultation with the Hawai'i Island Burial Council.

Interested persons please respond within 30 days of this notice to discuss appropriate treatment of these remains. Individuals responding must be able to adequately demonstrate lineal and/or cultural connection to the burials on the above referenced parcel in Maku'u, Puna, Hawai'i. Contact: Theresa Donham, DLNR-SHPD/ (808) 933-7650/ 40 Po'okela Street, Hilo Hawai'i, 96720; Holly McEldowney, DLNR-Division of State Parks/ (808) 587-0287/1151 Punchbowl Street, Room 310 Honolulu, Hawai'i 96813; Michael Dega, Scientific Consultant Services, Inc./ (808) 597-1182/ 711 Kapiolani Blvd. Ste. 975/ Honolulu, HI 96813; and/or Robert Spear, Scientific Consultant Services, Inc./711 Kapiolani Blvd. Ste. 975/ Honolulu, HI 96813 (808) 597-1182).

(297713 Hawaii Tribune-Herald: February 22, 25, 26, 2009)

IN THE MATTER OF
BURIAL NOTICE

BURIAL NOTICE

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(Hon. Adv.: Feb. 22, 25, 26, 2009) (A-639326)

1011.

STATE OF HAWAII
City and County of Honolulu

AFFIDAVIT OF PUBLICATION

ss.

Valerie L Yanagihara being duly sworn deposes and says that she is a clerk, duly authorized to execute this affidavit of THE HONOLULU ADVERTISER, a division of GANNETT PACIFIC CORPORATION, that said newspaper is a newspaper of general circulation in the State of Hawaii, and that the attached notice is a true notice as was published in the aforereferenced newspaper as follows

02/22/2009 The Honolulu Advertiser
02/25/2009 The Honolulu Advertiser
02/26/2009 The Honolulu Advertiser

and that affiant is not a party to or in any way interested in the above entitled matter.

Subscribed and sworn to before me this 26th day of February A.D. 2009

ELSIE A. MARUYAMA NOTARY 88-127 PUBLIC STATE OF HAWAII

Elsie A. Maruyama
Notary Public of the First Judicial Circuit
State of Hawaii My commission expires: 3/7/2012

NOTARY PUBLIC CERTIFICATION

Elsie A. Maruyama First Judicial Circuit
Document Description: Affidavit of Publication
No. of Pages: 1 Date of Doc. 2/26/2009

Elsie A. Maruyama 2/26/2009
Notary Signature Date

ELSIE A. MARUYAMA NOTARY 88-127 PUBLIC STATE OF HAWAII

Burial Notice Published in the July 2009 Issue of Ka Wai Ola

NO KA ILINA · BURIAL NOTICE

Maku'u Ahupua'a

Notice is hereby given that human remains were documented during Archaeological Inventory Survey of a property located in Maku'u Ahupua'a, Puna District, Island of Hawai'i, Hawai'i [TMK: (3)1-5-010:032]. The parcel is a portion of former Grant No. 1013, issued to D.W. Maiau in 1852.

Three of the unmarked burial sites are presumed to date to the Historic Period and one site is presumed to contain Traditional Native Hawaiian remains. Proper treatment shall occur in accordance with Chapter 6E, Revised Statutes, Section 43.5 regarding unmarked grave sites. The final disposition of the burials shall be made by the State Historic Preservation Division-Burial Sites Program in consultation with the Hawai'i Island Burial Council.

Interested persons please respond within 30 days of his notice to discuss appropriate treatment of these remains. Individuals responding must be able to adequately demonstrate lineal and/or cultural connection to the burials on the above referenced parcel in Maku'u, Puna, Hawai'i. Contact: Theresa Donham, DLNR-SHPD/ (808) 933-7653/ 40 Po'okela Street, Hilo, HI 96720; Holly McEldowney, DLNR-Division of State Parks/ (808) 587-0287/ 1151 Punchbowl Street, Room 310, Honolulu, HI 96813; Michael Dega, Scientific Consultant Services Inc./ (808) 597-1182/ 711 Kapi'olani Blvd., Ste. 975, Honolulu, HI 96813; and/or Robert Spear, Scientific Consultant Services Inc., 711 Kapi'olani Blvd., Ste. 975, Honolulu, HI 96813/ (808) 597-1182).

RC-0723

Cultural Impact Assessment for Proposed Development Activities on TMK 3-1-5-010:032

Makuʻu Ahupuaʻa
Puna District
Island of Hawaiʻi

DRAFT VERSION

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ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

RC-0723

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RECHTMAN CONSULTING

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INTRODUCTION

At the request of John and Maureen Gapp (landowners), Rechtman Consulting, LLC has prepared this cultural impact assessment to accompany an Environmental Assessment and a Conservation District Use Application associated with proposed development activities on TMK: (3)-1-5-010:032 in Makuʻu Ahupuaʻa, Puna, Hawaiʻi. (Figures 1 and 2). This 5.586-acre parcel is located southeast of the Hawaiian Paradise Park subdivision between the old Government Road and the coast at elevations ranging from 0 to 40 feet above sea level. The parcel is long and narrow and contains both state zoned Agricultural District and Conservation District designations. The parcel is bounded along its *makai* edge by the coastal set back, along both its long edges by undeveloped parcels, and along its *mauka* edge by the old Government Road. Terrain within the project area slopes gently to the northeast and consists of *pāhoehoe* lava flows that originated from Kilauea Volcano 450 to 700 years ago (Wolfe and Morris 1996). This area typically receives 60 to 100 inches of rain per year (Jurvik and Jurvik 1998:57). Standing water is present in low-lying bedrock areas over much of the parcel. A driveway exists along the southern boundary of the parcel leading northeast from the old Government Road for approximately 190 meters to the central portion of the property (Figure 3).

Vegetation consists of an over story of guava (*Psidium guajava*), mango (*Mangifera indica*), *hala* (*Pandanus odoratissimus*), rose apple (*Eugenia jambos*), octopus trees (*Shefflera actinophylla*), and coconut palms (*Cocos nucifera*), with an under story of ti (*Cordyline fruticosa*), *lauaʻe (Phymatosorus scolopendria)*, beach *naupaka* (*Scaevola sericea*), ginger (*Zingaberaceae*) and sisal (*Agave Sisalana*), along with various other non-native grasses, vines, weeds, and ferns (Figure 4). According to the landowner, an old concrete foundation was removed from the *makai* portion of the project area approximately five years ago. Vegetation in this area is indicative of mechanical land clearing, and consists of low lying, vines and grasses with no tall trees present. A 4WD road leads from the neighboring parcel to the west to this cleared area. The 4WD road is currently blocked to vehicular access at the Old Government Road.

The current study parcel was subject to an archaeological inventory survey conducted by Rechtman Consulting, LLC (Clark et al. (2008), as a result of which, nine archaeological sites containing sixty-seven features were recorded. Of those sites, two habitation sites were recommended for preservation as were four burial sites. For preservation purposes, the sites were grouped into four preservation areas, two of the preserve areas are exclusively in the Agricultural District portion of the parcel, one is within the Conservation District portion of the parcel, and one spans both Districts. Follow-up preservation plans were prepared for these six sites by Scientific Consultant Services, Inc. (Pestana et al. 2009a, 2009b). The current assessment study has been prepared pursuant to Act 50, approved by the Governor on April 26, 2000; and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impact*, adopted by the Environmental Council, State of Hawaiʻi, on November 19, 1997. Below is a description of the proposed development activities, a detailed cultural and historical background, and a presentation of prior studies; all of which combine to provide the physical and cultural setting and context. A summary of consultation is provided, followed by a discussion of potential cultural impacts and the appropriate actions and strategies to mitigate any potential impacts.

PROPOSED DEVELOPMENT ACTIVITIES

The landowner proposes to construct a one-story single-family dwelling, swimming pool, and shoreward cabana within the Conservation District portion of the parcel (Figure 5). The project would also include minor landscaping using mostly native or Polynesian species that are found in the area, as well as driveway improvements, and a septic system. The Agricultural District portion of the parcel will be left large as is.

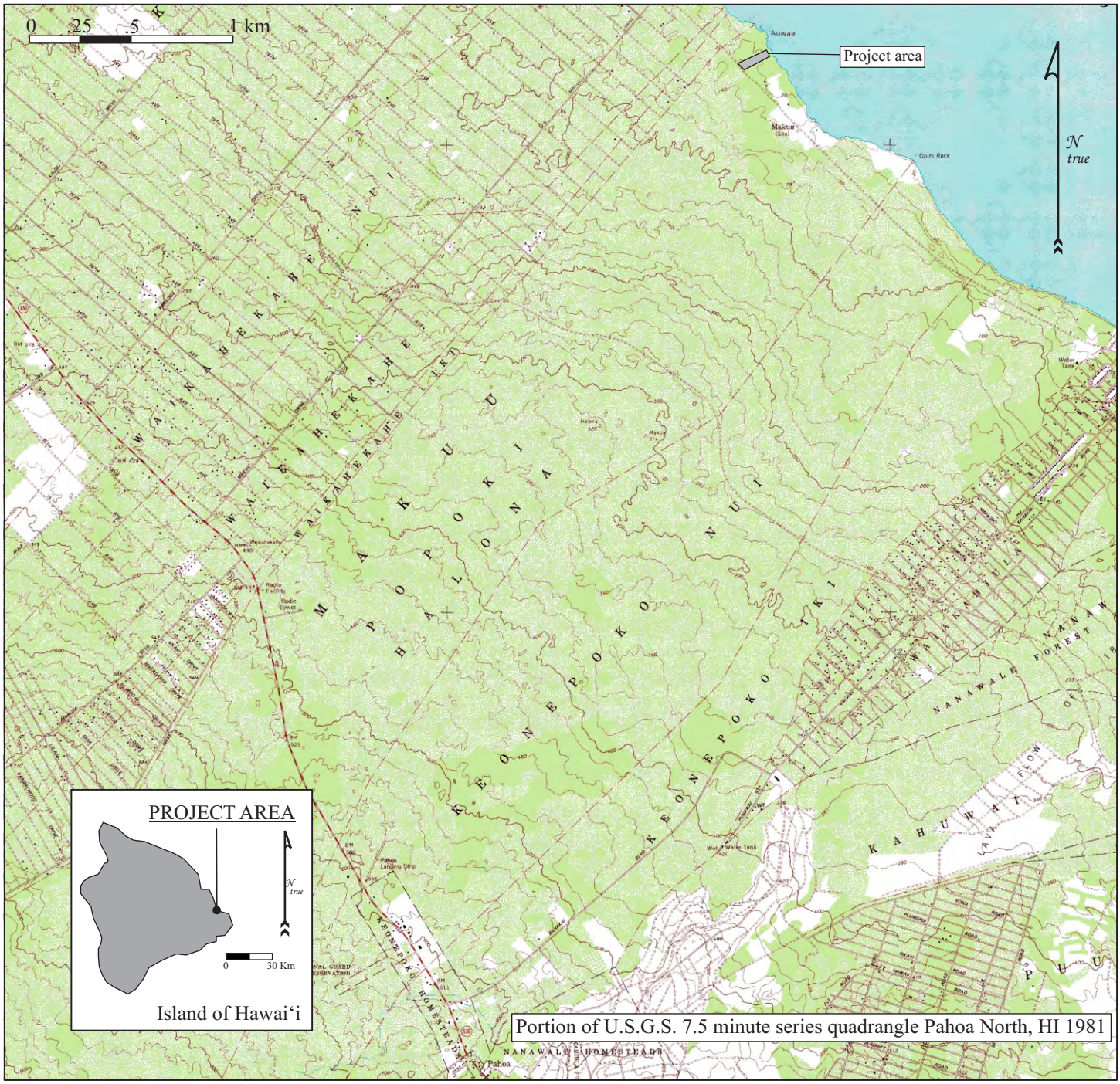


Figure 1. Project area location.

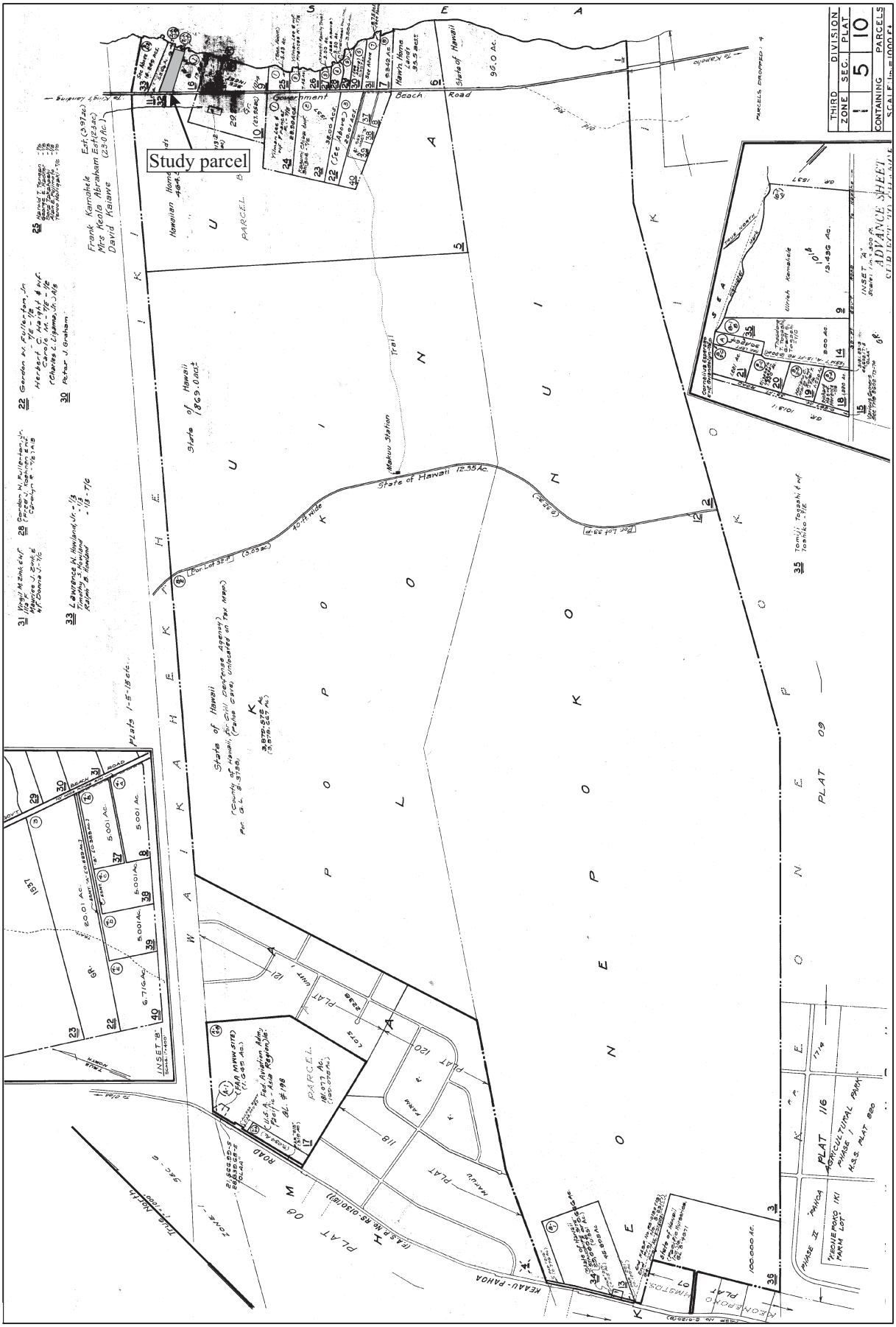


Figure 2. Tax Map Key (TMK):3-1-5-010 showing the current study parcel (032).

Figure 3. Grubbed driveway along the southern boundary of the parcel.

Figure 4. Typical vegetation on the parcel.

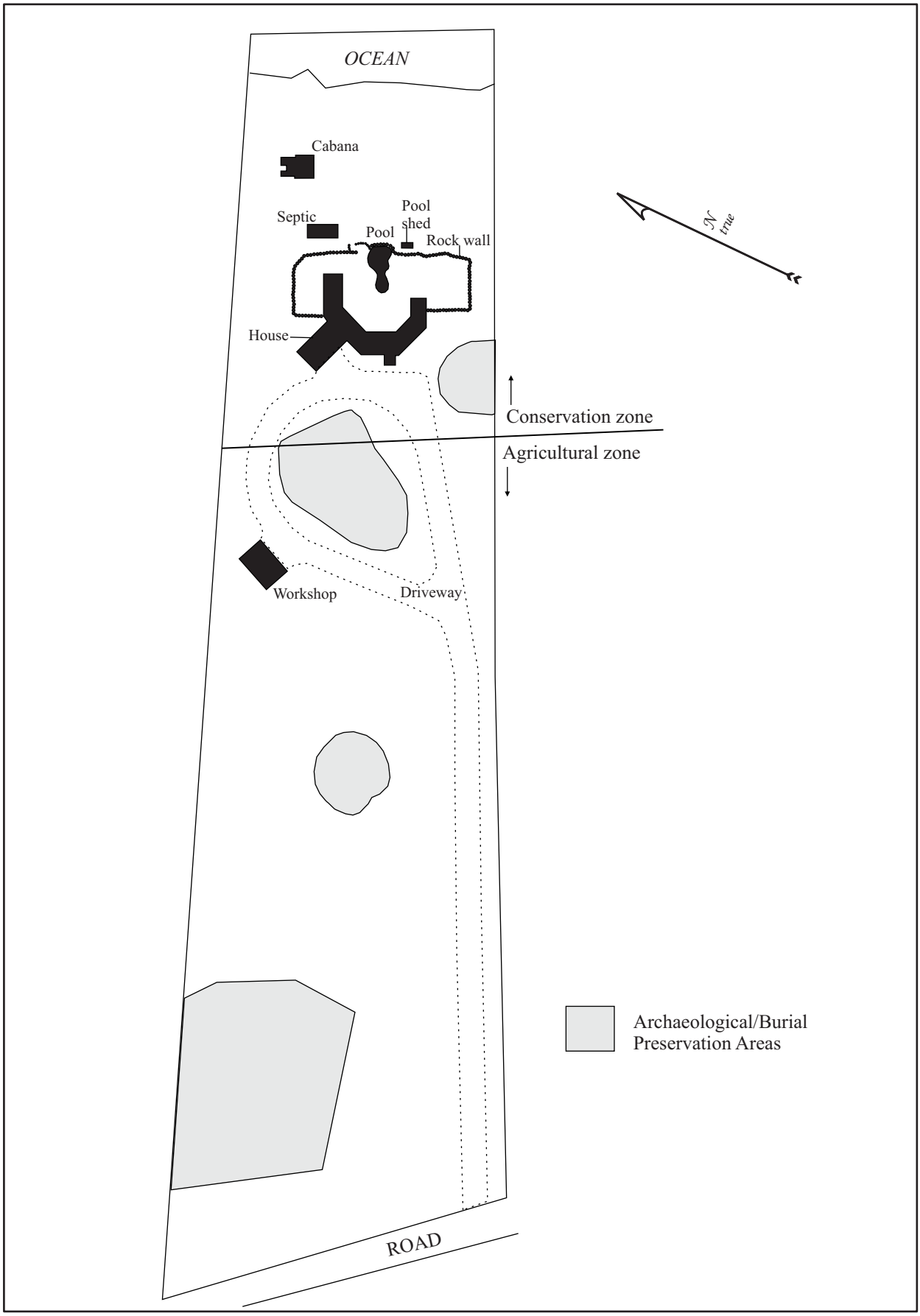


Figure 5. Proposed development plan.

CULTURE-HISTORICAL BACKGROUND

Archaeologists and historians describe the inhabiting of Hawai‘i in the context of settlement that resulted from voyages taken across the open ocean. For many years, researchers have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawai‘i were underway by A.D. 300, with long distance voyages occurring fairly regularly through at least the thirteenth century. However, as Kirch (2010) has recently argued, there is no archaeological evidence to support settlement of the Hawaiian Islands prior to about A.D. 1000. It has been generally reported that the sources of the early Hawaiian population—the Hawaiian Kahiki—were the Marquesas and Society Islands (Cordy 2000; Emory in Tatar 1982:16-18).

Whatever the timing, following initial settlement, communities were clustered along the watered, windward (*ko‘olau*) shores of the Hawaiian Islands. Along the *ko‘olau* shores, streams flowed and rainfall was abundant, and agricultural production became established. The *ko‘olau* region also offered sheltered bays from which deep sea fisheries could be easily accessed, and near shore fisheries, enriched by nutrients carried in the fresh water, could be maintained in fishponds and coastal waters. It was around these bays that clusters of houses where families lived could be found (McEldowney 1979:15). In these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1972:287).

Within a few generations after initial settlement, (by about A.D. 1200) the population began expanding to the *kona* (leeward side) and more remote regions of the island (Cordy 2000:130). In Kona, communities were initially established along sheltered bays with access to fresh water and rich marine resources. The primary “chiefly” centers were established at several locations—the Kailua (Kaiakeakua) vicinity, Kahalu‘u-Keauhou, Ka‘awaloa-Kealakekua, and Hōnaunau. The communities shared extended familial relations, and there was an occupational focus on the collection of marine resources. By the fourteenth century, inland elevations to around the 3,000-foot level were being turned into a complex and rich system of dryland agricultural fields (today referred to as the Kona Field System). By the fifteenth century, residency in the uplands was becoming permanent, and there was an increasing separation of the chiefly class from the common people. In the sixteenth century the population stabilized and the *ahupua‘a* land management system was established as a socioeconomic unit (see Ellis 1963; Handy et al. 1972; Kamakau 1961; Kelly 1983; and Tomonari-Tuggle 1985).

Over the generations, the ancient Hawaiians developed a sophisticated system of land and resources management. By the time ‘Umi-a-Līloa rose to rule the island of Hawai‘i in ca. 1525, the island (*moku-puni*) was divided into six districts or *moku-o-loko* (cf. Fornander 1973–Vol. II:100-102). Puna was one of these districts, and like the other large districts on Hawai‘i, was subdivided into *‘okana* or *kalana*. The *moku-o-loko* and *‘okana* or *kalana* were further divided into manageable units of land that were tended to by the *maka‘āinana* (people of the land) (cf. Malo 1951:63-67). Of all the land divisions, perhaps the most significant management unit was the *ahupua‘a*. *Ahupua‘a* are subdivisions of land that were usually marked by an altar with an image or representation of a pig placed upon it (thus the name *ahu-pua‘a* or pig altar). In their configuration, the *ahupua‘a* may be compared to wedge-shaped pieces of land that radiate out from the center of the island, extending to the ocean fisheries fronting the land unit. Their boundaries are generally defined by topography and geological features such as *pu‘u* (hills), ridges, gullies, valleys, craters, or areas of a particular vegetation growth.

The *ahupua‘a* were also divided into smaller individual parcels of land (such as the *‘ili*, *kō‘ele*, *māla*, and *kīhāpai*, etc.), generally oriented in a *mauka-makai* direction, and often marked by stone alignments (*kuaiwi*). In these smaller land parcels the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people, who lived in a given *ahupua‘a* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *ali‘i* (see Kamakau 1961:372-377 and Malo 1951:63-67).

Entire *ahupuaʻa*, or portions of the land were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *aliʻi-ʻai-ahupuaʻa* (chief who controlled the *ahupuaʻa* resources). The *aliʻi-ʻai-ahupuaʻa* in turn answered to an *aliʻi ʻai moku* (chief who claimed the abundance of the entire district). Thus, *ahupuaʻa* resources supported not only the *makaʻāinana* and *ʻohana* who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning. In this system, the land provided fruits and vegetables and some meat in the diet, and the ocean provided a wealth of protein resources.

The current project area is located within the Puna Distict's Makuʻu Ahupuaʻa. Barrère (1959) summarizes the Precontact geopolitics of the Puna District as follows:

> Puna, as a political unit, played an insignificant part in shaping the course of history of Hawaii Island. Unlike the other districts of Hawaii, no great family arose upon whose support one or another of the chiefs seeking power had to depend for his success. Puna lands were desirable, and were eagerly sought, but their control did not rest upon conquering Puna itself, but rather upon control of the adjacent districts, Kau and Hilo. (Barrère 1959:15)

Despite the perceived lack of importance with respect to the emerging political history of Hawaiian leadership, Puna was a region famed in legendary history for its associations with the goddess Pele and god Kāne (Maly 1998). Because of the relatively young geological history and persistent volcanic activity the region's association with Pele has been a strong one. However, the association with Kāne is perhaps more ancient. Kāne, ancestor to both chiefs and commoners, is the god of sunlight, fresh water, verdant growth, and forests (Pukui 1983). It is said that before Pele migrated to Hawaiʻi from Kahiki, there was "no place in the islands . . . more beautiful than Puna" (Pukui 1983:11). Contributing to that beauty were the groves of fragrant *hala* and forests of *ʻōhiʻa lehua* for which Puna was famous:

> *Puna pāia ʻala i ka hala* (Puna, with walls fragrant with pandanus blossoms).
> Puna, Hawaiʻi, is a place of *hala* and *lehua* forests. In olden days the people would stick the bracts of *hala* into the thatching of their houses to bring some of the fragrance indoors. (Pukui 1983:301)

The inhabitants of Puna were likewise famous for their expertise and skill in *lauhala* weaving. In Precontact and early Historic times the people lived in small settlements along the coast where they subsisted on marine resources and agricultural products. According to McEldowney (1979), six villages were present along the coast between Hilo and Cape Kumakahi (Keaʻau or Haena, Makuʻu, Waiakahiula, Honolulu, Kahuwai, and Kula or Koaʻe). The current project area is located in the vicinity of Makuʻu Village (the U.S.G.S. 7.5 min series quadrangle of Pahoa North, HI shows the approximate location of the village, labeled 'MAKUU Site'; see Figure 1). Each of the villages, McEldowney notes:

> …seems to have comprised the same complex of huts, gardens, windbreaking shrubs, and utilized groves, although the form and overall size of each appear to differ. The major differences between this portion of the coast and Hilo occurred in the type of agriculture practiced and structural forms reflecting the uneven nature of the young terrain. Platforms and walls were built to include and abut outcrops, crevices were filled and paved for burials, and the large numbers of loose surface stones were arranged into terraces. To supplement the limited and often spotty deposits of soil, mounds were built of gathered soil, mulch, sorted sizes of stones, and in many circumstances, from burnt brush and surrounding the gardens. Although all major cultigens appear to have been present in these gardens, sweet potatoes, ti (*Cordyline terminalis*), *noni (Morinda citrifolia*), and gourds (*Lagenaria siceraria*) seem to have been more conspicuous. Breadfruit, pandanus, and mountain apple (*Eugenia malaccensis*) were the more significant components of the groves that grew in more disjunct patterns than those in Hilo Bay. [1979:17]

Captain James Cook landed in the Hawaiian Islands on January 18, 1778. Ten months later, on a return trip to Hawaiian waters, Kamehameha visited Cook on board the *Resolution* off the East coast of Maui while Kalaniopuʻu (Hawaiʻi chief) was at war with Kahekili (Maui chief) (Kamakau 1992). The following January [1779], Cook and Kalaniopuʻu met in Kealakekua Bay and exchanged gifts. In February, Cook set sail; however, a severe storm damaged a mast and they had to return to Kealakekua. Cook's return occurred at an inopportune time, and this misfortune cost him his life (Kuykendall and Day 1976).

Around A.D. 1780 Kalaniʻōpuʻu proclaimed that his son Kiwalao would be his successor, and he gave the guardianship of the war god Kūʻkāʻilimoku to Kamehameha. Kamehameha and a few other chiefs were concerned about their land claims, which Kiwalao did not seem to honor, so after usurping Kiwalao's authority with a sacrificial ritual, Kamehameha retreated to his district of Kohala. While in Kohala, Kamehameha farmed the land, growing taro and sweet potatoes (Handy and Handy 1972). After Kalaniʻōpuʻu died in A.D. 1782 civil war broke out: Kiwalao was killed. The wars between Maui and Hawaiʻi continued until A.D. 1795 (Kuykendall and Day 1976; Handy and Handy 1972).

In A.D. 1790 two American vessels, the *Eleanora* and *Fair American*, were in Hawaiian waters. Following an altercation between his crew and natives, the Captain of the *Eleanora* massacred more than 100 natives at Olowalu [Maui], then sailed away leaving one of its crew, John Young, on land. The other vessel, the *Fair American*, was captured and its crew killed except for one member, Isaac Davis. Kamehameha observed this but did not participate, although he did prevent Young and Davis from leaving. He also kept the vessel as part of his fleet. Young eventually became governor of the island of Hawaiʻi. By 1796 Kamehameha had conquered all the island kingdoms except Kauaʻi. It wasn't until 1810, when Kaumualiʻi of Kauai gave his allegiance to Kamehameha, that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976).

Demographic trends during this period indicate population reduction in some areas, due to war and disease, yet increases in others, with relatively little change in material culture. However, there was a continued trend toward craft and status specialization, intensification of agriculture, *aliʻi* controlled aquaculture, upland residential sites, and the enhancement of traditional oral history. The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners had introduced the concept of trade for profit, and by the time Kamehameha I had conquered Oʻahu, Maui and Molokaʻi, in 1795, Hawaiʻi saw the beginnings of a market system economy (Kent 1983). This marked the end of an era of uniquely Hawaiian culture.

Hawaiʻi's culture and economy continued to change drastically as capitalism and industry established a firm foothold. The sandalwood (*Santalum ellipticum*) trade, established by Euro-Americans in 1790 and turned into a viable commercial enterprise by 1805 (Oliver 1961), was flourishing by 1810. This added to the breakdown of the traditional subsistence system, as farmers and fishermen were ordered to spend most of their time logging, resulting in food shortages and famine that led to a population decline. Kamehameha did manage to maintain some control over the trade (Kuykendall and Day 1976; Kent 1983).

Kamehameha I died on May 8, 1819 at Kamakahonu in Kailua-Kona, and once again the culture of Hawaiʻi was to change radically. Following the death of a prominent chief, it was customary to remove all of the regular *kapu* that maintained social order and the separation of men and women and elite and commoner. Thus, following Kamehameha's death a period of *ʻai noa* (free eating) was observed along with the relaxation of other traditional *kapu*. It was for the new ruler and *kahuna* to re-establish *kapu* and restore social order, but at this point in history traditional customs saw a change:

> The death of Kamehameha was the first step in the ending of the tabus; the second was the modifying of the mourning ceremonies; the third, the ending of the tabu of the chief; the fourth, the ending of carrying the tabu chiefs in the arms and feeding them; the fifth, the ruling chief's decision to introduce free eating (*ʻainoa*) after the death of Kamehameha; the sixth, the cooperation of his aunts, Ka-ahu-manu and Ka-heihei-malie; the seventh, the joint action of the chiefs in eating together at the suggestion of the ruling chief, so that free eating became an established fact and the credit of establishing the custom went to the ruling chief. This custom was not so much of an innovation as might be supposed. In old days the period of mourning at the death of a ruling chief who had been greatly beloved was a time of license. The women were allowed to enter the heiau, to eat bananas, coconuts, and pork, and to climb over the sacred places. You will find record of this in the history of Ka-ula-hea-nui-o-ka-

> moku, in that of Ku-aliʻi, and in most of the histories of ancient rulers. Free eating followed the death of the ruling chief; after the period of mourning was over the new ruler placed the land under a new tabu following old lines. (Kamakau 1992:222)

Immediately upon the death of Kamehameha I, Liholiho (his son and to be successor) was sent away to Kawaihae to keep him safe from the impurities of Kamakahonu brought about from the death of Kamehameha. After purification ceremonies Liholiho returned to Kamakahonu:

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

When Liholiho, Kamehameha II, ate the *kapu* dog meat, entered the *lauhala* house and did whatever he desired it was still during a time when he had not reinstituted the eating *kapu* but others appear to have thought otherwise. With an indefinite period of free-eating and the lack of the reinstatement of other *kapu* extending from Hawaiʻi to Kauaʻi, and the arrival of the Christian missionaries shortly thereafter, the traditional religion had been officially replaced by Christianity within a year following the death of Kamehameha I (see Kameʻeleihiwa (1992) for an alternative explanation suggesting an intentioned overthrow of the *ʻai kapu*).

"*Aliʻi Nui* received their political power from Kū; therefore, an *Aliʻi* must be religious and proclaim the *ʻAikapu* upon his ascent to the office of *Mōʻi*. If he did not his people would reject him as irreligious and other *Aliʻi Nui* would be tempted to usurp his position." (Kameʻeleihiwa 1992:39). Liholiho's cousin, Kekuaokalani, caretaker of the war god Kūʻkāʻilimoku, was one such *Aliʻi Nui* and he revolted. However, by December of 1819 the revolution was quelled. Kamehameha II sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the *ʻaumakua* worship, to continue (Oliver 1961; Kamakau 1992).

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawaiʻi. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *aliʻi*, who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopt their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government.

In 1823, British missionary William Ellis and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawaiʻi seeking out communities in which to establish church centers for the growing Calvinist mission. Ellis recorded observations made during this tour in a journal (Ellis 1963). His writings contain descriptions of residences and practices that are applicable to the general study area:

> The population in this part of Puna, though somewhat numerous, did not appear to possess the means of subsistence in any great variety or abundance; and we have often been surprised to find desolate coasts more thickly inhabited than some of the fertile tracts in the interior; a circumstance we can only account for, by supposing that the facilities which the former afford for fishing, induce the natives to prefer them as places of abode; for they find that where the coast is low, the adjacent water is usually shallow.
>
> We saw several fowls and a few hogs here, but a tolerable number of dogs, and quantities of dried salt fish, principally albacores and bonitos. This latter article, with their *poë* [*poi*] and sweet potatoes, constitutes nearly the entire support of the inhabitants, not only in this vicinity, but on the sea coasts of the north and south parts of the island.

> Besides what is reserved for their own subsistence, they cure large quantities as an article of commerce, which they exchange for the vegetable productions of Hilo and Mamakua [Hāmākua], or the *mamake* and other tapas of Ora [ʻŌlaʻa] and the more fertile districts of Hawaii. (Ellis 1963:190-191)

During this period, the sandalwood trade was wreaking havoc on the commoners, who were weakening with the heavy production, exposure, and famine just to fill the coffers of the *aliʻi* who were no longer under any traditional constraints (Oliver 1961; Kuykendall and Day 1976). On a stopover in the Kohala District of Hawaiʻi Island Ellis observed:

> Before daylight on the 22nd, we were roused by vast multitudes of people passing through the district from Waimea with sandal-wood, which had been cut in the adjacent mountains for Karaimoku, by the people of Waimea, and which the people of Kohala, as far as the north point, had been ordered to bring down to his storehouse on the beach, for the purpose of its being shipped to Oahu. There were between two and three thousand men, carrying each from one to six pieces of sandal-wood, according to their size and weight. It was generally tied on their backs by bands of ti leaves, passed over the shoulders and under the arms, and fastened across their breasts. (Ellis 1984:397)

The lack of control of the sandalwood trade was to soon lead to the first Hawaiian national debt as promissory notes and levies were initiated by American traders and enforced by American warships (Oliver 1961). As Osorio explains, it was foreign economic interests originally promoted by the Hawaiian League and their "bayonet constitution" that ultimately infiltrated beliefs, ideas, and institutions; and as he put it, "literally and figuratively dismembered the lāhui (the people) from their traditions, their land and ultimately their government" (2002:5). Indeed, the Hawaiian culture was well on its way towards Western assimilation, although not without resistance (Silva 2004), as industry in Hawaiʻi went from the sandalwood trade, to a short-lived whaling industry, to the more lucrative, but environmentally destructive sugar industry.

One year after Ellis' tour, the ABCFM established a base church in Hilo. From that church (Hāili), the missionaries traveled to the more remote areas of the Hilo and Puna Districts. David Lyman who came to Hawaiʻi in 1832, and Titus Coan who arrived in 1835 were two of the most influential Congregational missionaries in Puna and Hilo. As part of their duties they compiled census data for the areas within their missions. In 1835, 4,800 individuals were recorded as residing in the district of Puna (Schmitt 1973); the smallest total district Population on the island of Hawaiʻi. In 1841, Titus Coan recorded that most of the 4,371 recorded residents of Puna, lived near the shore, though there were hundreds of individuals who lived inland (Holmes 1985). One of the coastal settlement areas was Makuʻu, in the vicinity of the current project area.

In 1846, Chester S. Lyman, "a sometime professor" at Yale University visited Hilo, Hawaiʻi, and stayed with Titus Coan (Maly 1998). Traveling the almost 100 mile long stretch of the "Diocese" of Mr. Coan, Lyman reported that the district of Puna had somewhere between 3,000-4,000 inhabitants (Maly 1998). Entering Puna from Hilo, and traveling to Keaʻau along the coast, Lyman offered the following observations:

> …The groves of Pandanus were very beautiful, and are the principal tree of the region. There is some grass and ferns, and many shrubs; but the soil is very scanty. Potatoes are almost the only vegetable that can be raised, and these seem to flourish well amid heaps of stone where scarcely a particle of soil could be discovered. The natives pick out the stones to the depth often of from 2 to 4 feet, and in the bottom plant the potato–how it can expand in such a place is a wonder.
>
> Nearly all Puna is like this. The people are necessarily poor—a bare subsistence is all they can obtain, and scarcely that. Probably there are not $10 in money in all Puna, and it is thought that not over one in five hundred has a single cent. The sight of some of these potatoe patches would make a discontented N.E. farmer satisfied with his lot. Yet, I have nowhere seen the people apparently more contented & happy. (Maly 1998:35)

By the middle of the nineteenth century the ever-growing population of Westerners forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership, and the *Māhele* became the vehicle for determining ownership of native lands. The *Māhele* defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. As a result of the *Māhele*, all land in the Kingdom of Hawaiʻi came to be placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) Konohiki Lands (Chinen 1958:vii, Chinen 1961:13). The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission (Chinen 1961:13).

During the *Māhele* all lands were placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and *Konohiki* Lands. All three types of land were subject to the rights of the native tenants therein. In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawaiʻi to legally set the boundaries of all the *ahupuaʻa* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between A.D. 1873 and 1885 and was usually given in Hawaiian and transcribed in English as they occurred. Boundary descriptions were not collected for all *ahupuaʻa*.

As a result of the *Māhele* of 1848, the *ahupuaʻa* of Makuʻu was retained as Government Lands, and no *kuleana* parcels were awarded in the *ahupuaʻa* (Charvet-Pond and Rosendahl 1993:C-2). Between 1852 and 1855 portions of the *ahupuaʻa* were divided and sold as fee simple Land Grants. The Land Grants were sold to Native tenants who were interested in acquiring the land upon which they lived, or land that they felt they could cultivate (Maly 1999:64). Three Land Grants were sold in the coastal portion of Makuʻu, Pōpōkī, and Hālona *ahupuaʻa*; Grant No. 1013 to D. W. Maiau in 1852, Grant No. 1014 to Kea in 1852, and Grant No. 1537 to Kapohano(a) in 1855 (Figure 6). The current project area is a portion of Lot 1 of Grant No. 1013 (Figure 7). Maiau also received a second lot (Lot 2) as part of Grant No. 1013, which is located within the boundaries of Grant No.1014 to Kea (Figure 8). Kepā Maly translated the boundary description of Grant No. 1013 with a note that the surveyor (Thos. Cook) mistakenly described the northern boundary of Maiau's land as being along Keonepoko Ahupuaʻa instead of Waikahekahe Iki Ahupuaʻa. The boundaries of the grant parcel are described as follows:

> *Lot 1.*
>
> This lot begins at the shore, at the boundary wall of Keonepoko [Waikahekahe Iki], and proceeds South 56 ½ West 19.17 chains to the government road; then along the South 52 ½ East 25.10 chains to the land of Kea; then proceeding along the boundary of Kea North 53 ½ East 14.00 chains to the shore; than along the shore to the place of commencement. There are 38 17/20 acres in this parcel
>
> *Lot 2.*
>
> This lot begins at a kukui tree and proceeds along the land of kea…Bounded on all sides by Kea, containing 6/10th of an acre [Maly 1999:66].

In 1848, the Hawaiian Government also conducted a survey of schools on the Island of Hawaiʻi. The survey included a school in Makuʻu Ahupuaʻa. The location of the Makuʻu school lot is not shown on any of the cartographic resources reviewed during the inventory survey (Clark et al. 2008), but interestingly, the 1848 school report lists Maiau, who received Grant No. 1013, as the teacher in Makuʻu. The report lists Maiau's salary as 12½ cents per day, the number of students taught as 18, and the subjects taught as reading, arithmetic, geography, penmanship, philosophy, science, and religion (Maly 1999:63). The Puna school report for the period spanning October, 1873 to January, 1874 lists N. Kanihoa as the teacher at the school in Makuʻu. Kanihoa received a daily salary of 50 cents for teaching 18 students. The schoolhouse is listed as being in good condition, and the school supervisor at the time, J. Elderts, reported two deaths and no births in Makuʻu over that period (Maly 1999:79).

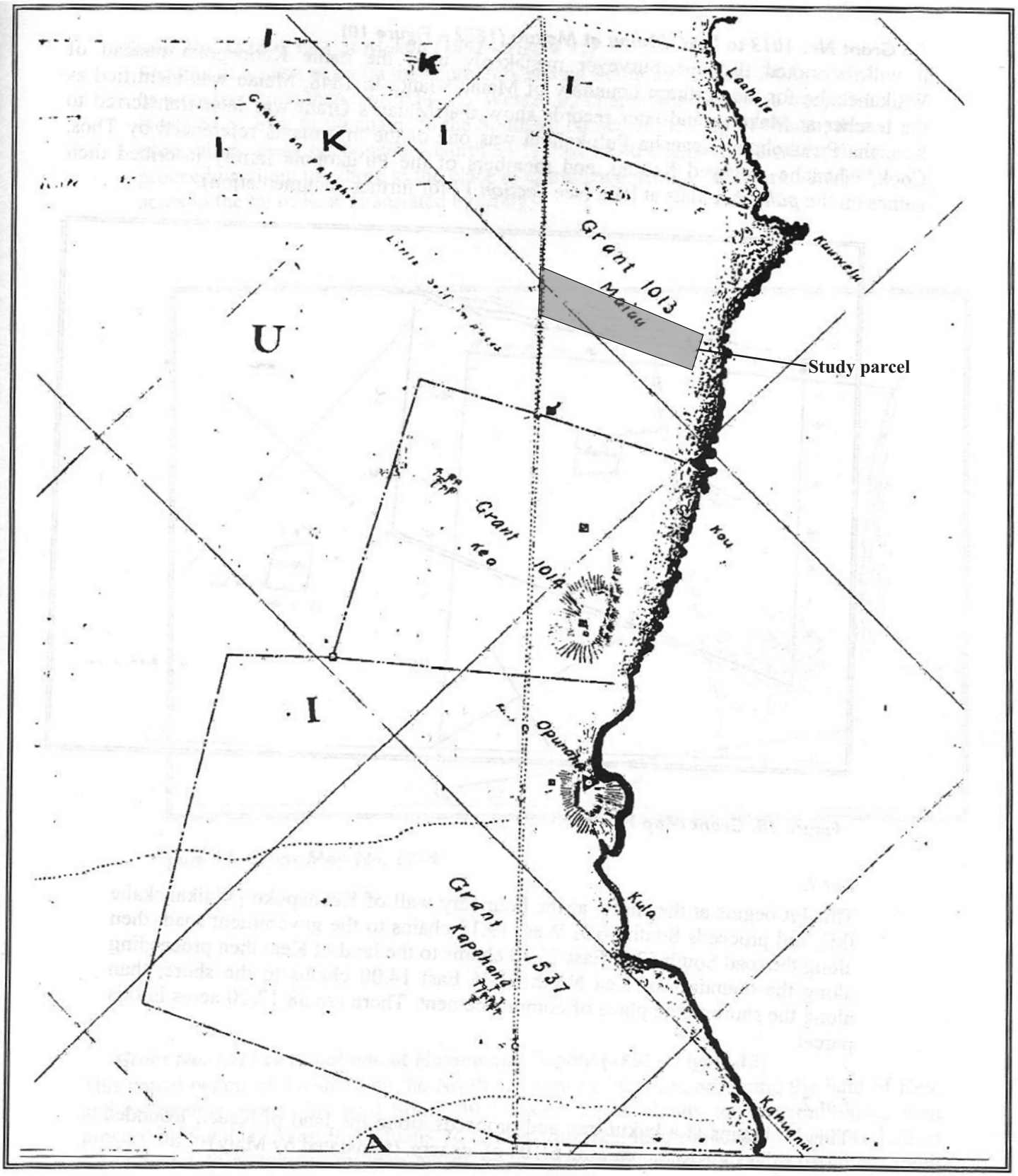


Figure 6. Portion of 1903 Register map No. 2258 showing land grants and the current study parcel.

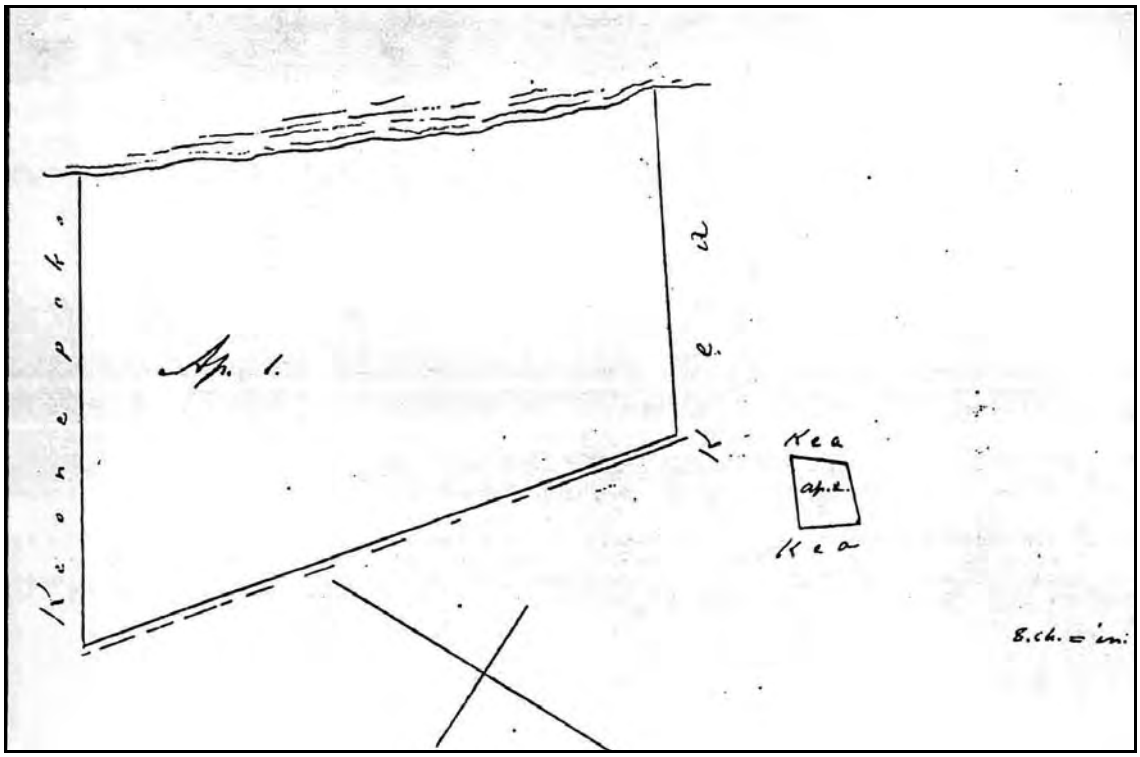


Figure 7. Map of Grant No. 1013 to Maiau (from Maly 1999:67).

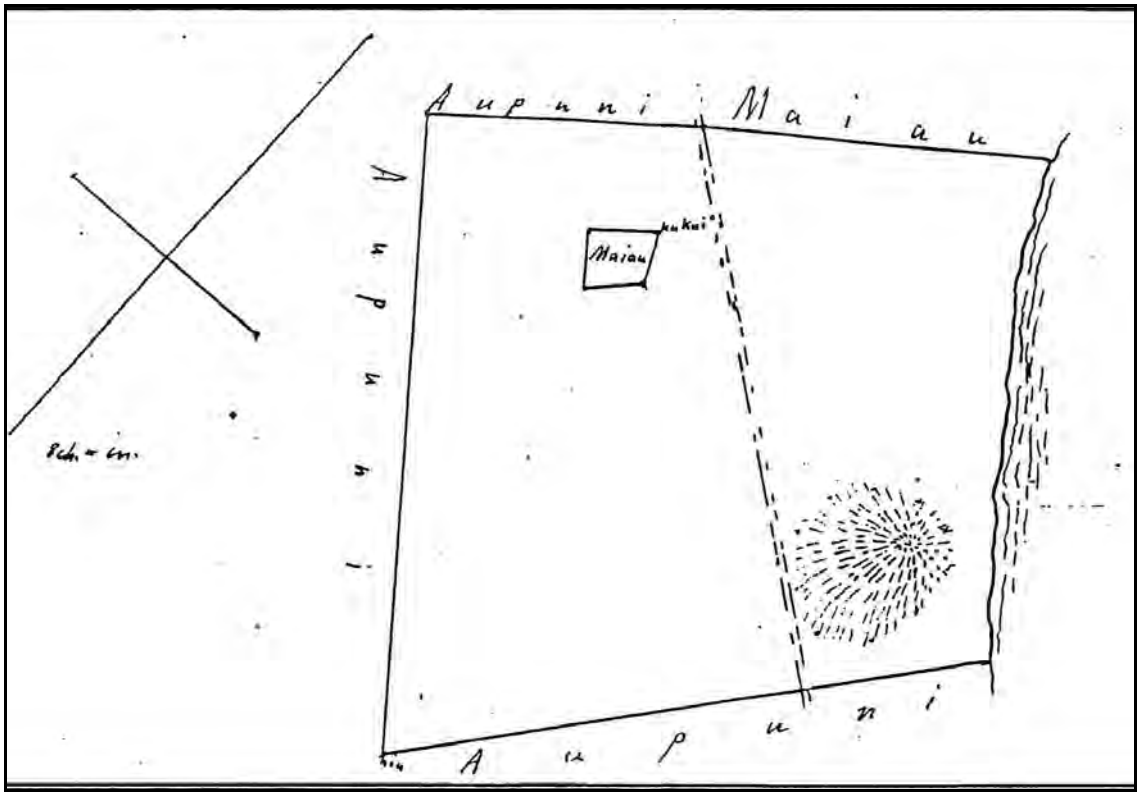


Figure 8. Map of Grant No. 1014 to Kea (from Maly1999:68).

By 1873, the Government Road from Hilo through Puna had been completed to at least Makuʻu (Maly 1999). The road likely followed the route of an older pedestrian trail (Lass 1997). An 1873 petition states that "He [J.W. Kumahoa as Road Supervisor of Puna] made the road at Makuu", and that "it was a very treacherous place before, but through his work is good at this time" (Maly 1999:78). Cattle ranching got its start in the area around this time. In 1872, Obed B. Spencer, a rancher, leased Keaʻau Ahupuaʻa (to the northwest of Makuʻu Ahupuaʻa; see Figure 1) from Charles Kanaina and Charles R. Bishop, guardians of William C. Lunalilo for a term of ten years beginning September 1, 1873. Spencer then transferred the lease and sold his personal property to J.O. Dominis and R. A. Lyman. The assignment of lease and bill of sale stated that:

> The lease of the Land known as Keaau in the District of Puna, Island of Hawaiʻi and all other leases held by me in the District of Puna aforesaid together with all buildings and improvements to me belonging upon the said lands, and also all my flock of cattle running on the land of Keaau aforesaid and on the adjoining lands branded "OS" or " " or " " together with my brand "OS" and also my flock of goats and sheep running on the land of Keaau aforesaid and the adjoining lands and also my fowls and hogs on the lands aforesaid. And also the following horses [names 10 horses; also lists two foals, four mules, seven donkeys] …Also a lot of lumber and shingles, a table and potatoes growing…(Bureau of conveyances; Lib. 37:488-489; in Maly 1999:78)

Lyman and Dominis subsequently reported that the number of cattle branded "OS"on the leased lands was 300, and the number of goats was 4,000 (Maly 1999:78). In 1874, the two men also formalized a ten-year lease for Waikahekahe Iki Ahupuaʻa (located between the *ahupuaʻa* of Keaʻau and Makuʻu), extended the lease of Keaʻau Ahupuaʻa for a term of 25 years, and leased Makuʻu, Hālona, Keoneopoko Iki, Kaʻohe, and Pōpōkī *ahupuaʻa* for a term of ten years (Maly 1999). By 1876, however, Lyman sold his interest in the *ahupuaʻa* of Keaʻau to Charles R. Bishop for $8,333.00, who in turn, in consideration of $120,000.00, assigned the lease to the Hawaiian Agricultural Company (Maly 1999:83). In September of 1877, the Hawaiian Agricultural Company, in consideration of $33,000.00, assigned lease and business interests in Keaʻau Ahupuaʻa to J. E. Elderts and William H. Shipman (Maly 1999:84). By 1879 Elderts and Shipman's Keaʻau Ranch included most of the lands between Keaʻau and Kapoho *ahupuaʻa* (Cahill 1996).

On February 28th, 1876, the Boundary Commission heard testimony from Palau, a resident of Makuʻu, concerning the boundaries of Waikahekahe Iki Ahupuaʻa (along the northwestern boundary of Makuʻu Ahupuaʻa). Palau stated:

> …I was born at Waikahekaheiki Puna, Hawaiʻi, at the time of *Niaukani o Kalii* (ca. 1811) and was grown up when missionaries first came to Hilo. I now live at Makuu the adjoining land. Have always lived on these two lands. I am a *kamaaina* of Waikahekaheiki. My mother Mau was a *kamaaina* of the land, and showed me the boundaries. The boundary at the shore between this land and land of Makuu, is at a *kaulapa* [a ridgeline or point] called Kuwelu [Kuʻuwelo], there is also a *mauwae* [fissure] there: Thence the boundary runs *mauka* along the Kaulapa to the end of it, and on across the Govt. road to an *ahu Pahoehoe* [*pāhoehoe* rock cairn] near the road; thence *mauka* to old road to an *ahu pohaku* [stone cairn] at place called Kaumanumanu, thence *mauka* across old *pahoehoe* to the *pili* place called Kulanapahu. Thence to *pili* on Hilo side of grove of breadfruit trees at place called Kahoolua. Thence *mauka* to *pili* on Hilo side of Puunanaio, a breadfruit tree and old *mahina ai* [cultivated field]. Thence boundary runs *mauka* across *pahoehoe* to place called Papamaihi an *oioina* [trail side resting place] on the old road from Kaimu. Thence *mauka* to Puna side (or Kau side) of where houses used to be at old cultivating ground at place called Wahileolae. The point of woods called Makaohe are on Makuu, and part of *pahoehoe*. Thence the boundary runs *mauka* to old road from Kaunamano to Kalae, where I was told Waikahekaheiki ends. This land is bounded *makai* by the sea. The ancient fishing rights extend way out to sea… (Volume B:399-400 in Maly 1999:56-57)

In 1877, H.R. Hitchcock, the Inspector General of schools, reported that the schools in Puna had deteriorated slightly from their former good standing owing to the resignation of some of the best teachers (Maly 1999:83). He noted that, "the schools in Keauhou and Makuu are both very small, and as they are within three miles of each other, I have told the school agent to unite the two under one teacher, who shall teach two or more hours at each place, daily" (in Maly 1999:83). Hitchcock also described the difficulty students had keeping animals out of their fields (the produce from the fields was used to finance the school's operation). Typically, to keep the animals out, they had to enclose the school lots with high walls and not include a gateway. Hitchcock wrote:

> Puna is a district overrun by cattle, goats and hogs, which regard not stone walls, and patiently wait until the crops begin to be valuable, then appropriate them largely to their own use. This has a depressing effect upon the little workers, who add cubits to the height of the walls, until it becomes a matter of peril to the inspector to climb over them in order to enter the school house…(State Archives — Board of Education Series 262, Hawaii reports — 1877: 1 & 2; in Maly 1999:83-84)

In an 1891 report on the Government Schools of the Puna District, Abraham Kekino was listed as the teacher of nine students at the school in Makuʻu (Maly 1999:102). The report also noted, however, that there was no longer a schoolhouse at Makuʻu, and that the school at Keaʻau was gone, but that the Olaʻa school was a good building and S. Kaulupali was the teacher.

Around this time Henry M. Whitney, editor of the Hawaiian Gazette began publishing promotional guides of Hawaiʻi to encourage tourism to the Islands. In 1890 he published an account of travel along the Hilo and Puna coastal road. He observed that at "Makuu, 15 miles from Hilo, there is quite a little settlement" (Whitney in Maly 1999:40). A survey for a new inland road through Puna District was completed in 1891. Prof. W. D. Alexander, the Surveyor General for this Hawaiian Government Survey, included several interesting notes on the terrain, vegetation, and population distribution of Makuʻu Ahupuaʻa and neighboring lands in his report on the progress of the survey. The following are excerpts are from Prof. Alexander's report:

> …the general elevation being 475 feet, distance from the sea coast being 6 mile. This stretch of seven miles, lying over large tracts of smooth solid lava, of the kind marked with rope like lines and concentric folds, and covered with thin Ohia woods, is remarkably easy to travel over, and for the progress of the bullock cart would afford no difficulty even now. The extensive forests of Makuʻu and Halona Gov't lands, distant one and one-half miles above the road line, filled with an exuberant mass of shrubbery , in which the presence of bananas, *Ki* [ti], Yam, *Awa* can be easily distinguished, and the growths of young Sandal wood, which seem to thrive and find support in the fissures which intersect the surface are features which would make the near approach desirable.
>
> …there is nothing to enjoin, from constructing feeders to the main road, at available points, making use, where possible of the numerous trails built and used in ancient time, by the natives, for access to these localities, their old planting grounds.
>
> …The first settlement met with after leaving Hilo by the sea coast road, is at Keaau, a distant 10 miles where there are less than a dozen inhabitants; the next is at Makuu, distant 14 miles where there are a few more, after which there is occasionally a stray hut or two, until Halepuaa and Koae are reached, 21 miles from Hilo, at which place there is quite a village…A good many of those living along the lower road have their cultivating patches in the interior.
>
> …over the barest fields there is found a stunted growth of trees and a sprinkling of verdure, struggling for recognition and growing in the many crevices and cavities in the lava, while it is true that efforts at cultivation are made here and there these seem to succeed only in the holes made among the stones or diminutive patches of earth scattered here and there…
>
> …Nearly all of the food consumed by the residents of this District is raised in the interior belt to which access is had by ancient paths or trails leading from the sea coast…The finest sweet potatoes are raised in places that look more like banks of cobble stones…

> …The old sea coast road cannot be kept in repair with the means now at its disposal and its condition each year is becoming more unsafe and ruinous, there is but little travel over it; it has been shewn [shown] that there is little land capable of cultivation or development either side of it and whatever travel there is now would soon be entirely diverted to the upper road…(in Maly 1999:105-107)

By the late 1800s land use in the Puna District was changing. By 1900, the new highway was completed. Between 1894 and 1900, W. H. Shipman, who had by that time acquired sole interest in Keaʻau Ahupuaʻa and neighboring lands, sold nearly 4,000 acres to various individuals for the cultivation of coffee and in 1899 he leased nearly 4,000 acres to the Olaʻa Sugar Company, Ltd. (Maly 1999). In 1901, 1911, and 1912, A. B. Loebstien and Theos. Cook surveyed the boundaries of Shipman's lands. Many of the informants for the surveys were native residents of Keaʻau and Makuʻu. Interestingly, in the early 1900s, Grant No. 1013, of which the current project area is a part, was transferred to Keanalia Puʻukoholā, one of the informants for Thos. Cook (Maly 1999). Register map No. 2258 (ca. 1903) shows a single house within the boundaries of Grant No. 1013:1 (see Figure 6). The house is located in the southern corner of the grant boundary near the Old Government Road, outside of the current project area. A 1924 Makuʻu U.S.G.S. Quadrangle shows two different houses within the grant parcel, both are located in the northern corner of the parcel near the coast, also outside the current project area (Figure 9).

During the early part of the 20th century the Puna District underwent drastic changes. The native system of agricultural had nearly completely disappeared as a result the drastic population decline (Yent and Ota 1982), and ranching, sugarcane, coffee, and lumber became the dominant industries. The Keaau Ranch had begun grazing cattle as early as the 1850s and ranching operations continued to expand during this time (Maly 1999:42). The Olaa and Puna Sugar Companies operated in Puna from 1900 until the 1980s (Dorrance and Morgan 2000). Beginning in 1900, railroad tracks were laid by the Hawaiʻi Railway Company for hauling sugarcane (and passenger travel) from the fields in lower Puna to the mills in Pahoa and Keaʻau (Clark et al. 2001). The railroad passed through Makuʻu Ahupuaʻa *mauka* of the current project area, stopping at the Makuʻu Station house (see Figure 9). The railroad ceased operations in 1946.

By 1930, W. H. Shipman had initiated Land Court proceeding (Land Court Application 1053) to record the boundaries of Keaʻau Ahupuaʻa. Of general interest in the proceedings were the condition of trails crossing the land and their ownership. A 1933 map of trails in Keaʻau Waikahekahe Nui and Waikahekahe Iki shows the trails in question (Figure 10). Two sworn affidavits from native residents of the area accompanied the land court application.

One of the native residents was David Malo, who was born in 1852 at Makuʻu, where he lived until 1870 when his father died. In his affidavit he states, among other things, that:

> …The people living in Olaa were tenants at will while under Queen Emma. My father was the Queen's Konohiki. The people that were living in Keaau paid money for living on the land. Only tenants were allowed to go on the land.
>
> …The only main trail or main Public Highway that was used by everybody at that time is the trail that starts from about 12 miles Olaa, and goes down to Waipahoehoe, and on to Makuu till it meets the King Highway.
>
> There were many other trails running down to the King Highway and the beach, some of them were made by cowboys for driving cattles, and some of them were made by cows.
>
> …At Waikahekahe there was a village. The children of that village went to school at Makuu…(in Maly 1999:122-123)

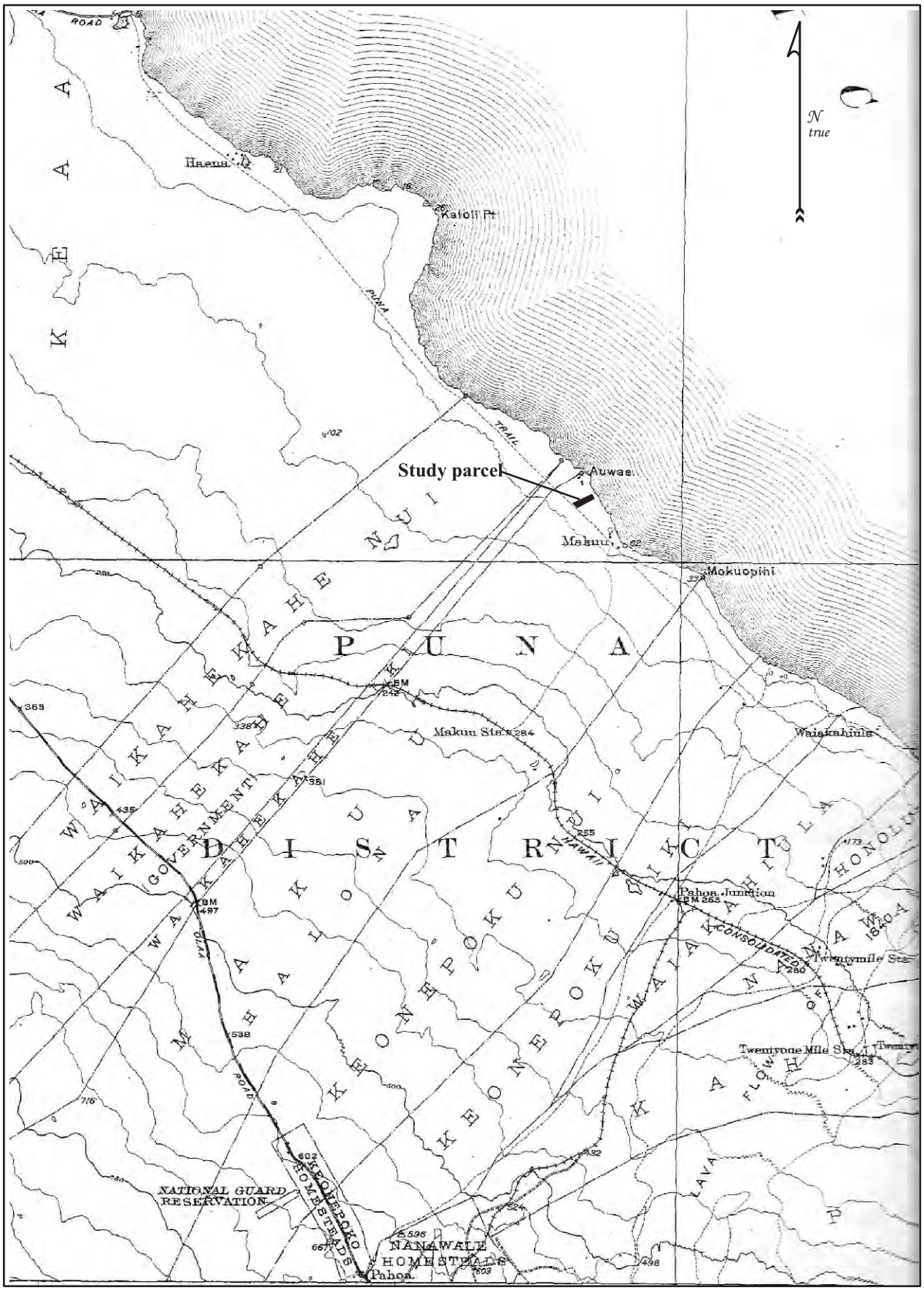
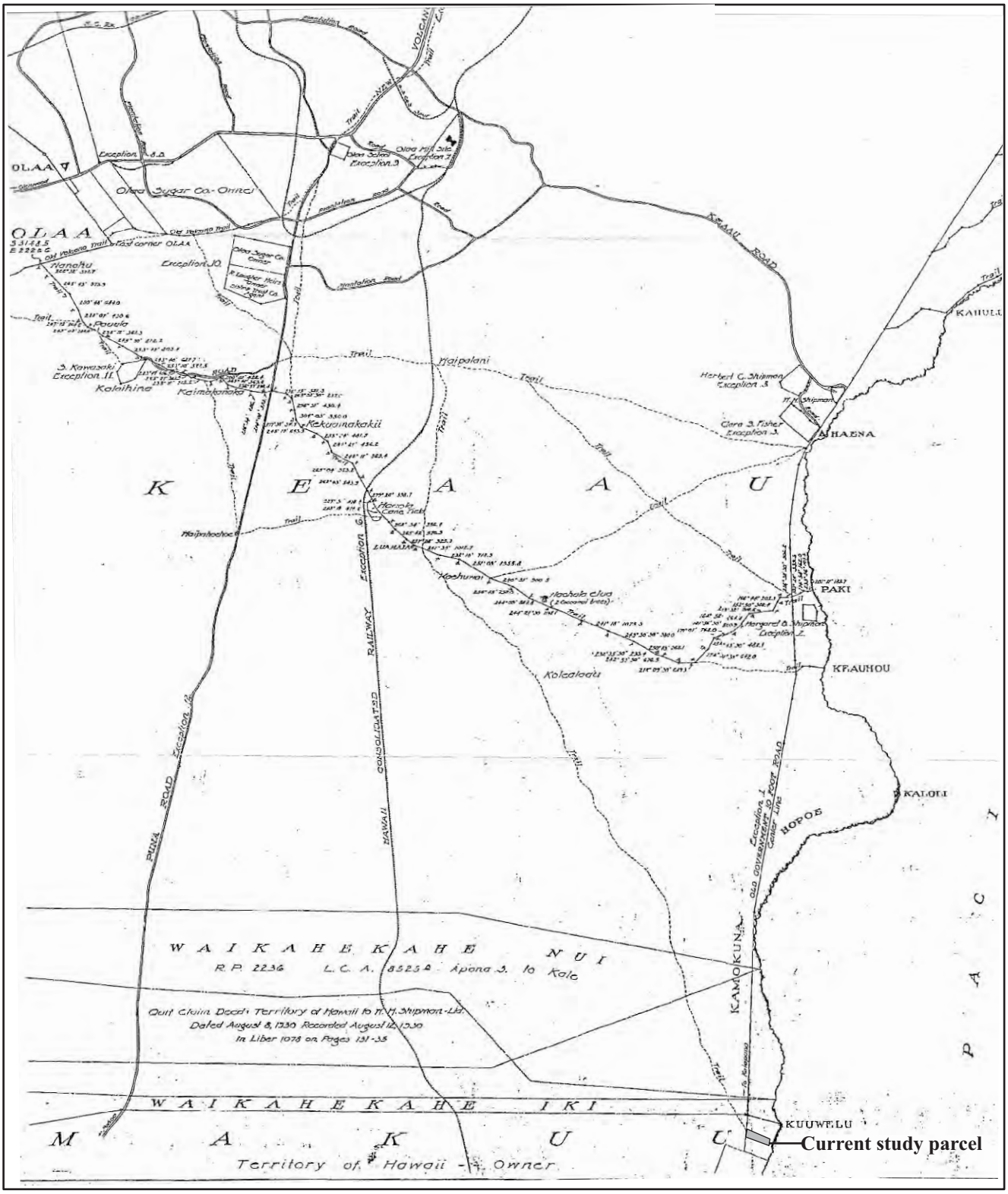


Figure 9. Portion of a 1924 U.S.G.S. Makuu Quadrangle, showing the current study parcel.


OLAA
Olaa Sugar Co.-Omnci
Kaimalolo
Kekuaiwakakii
Kaiaiaha
Kaiaipalani
Kaiaiaoloa
Kaiaiaoloa
Kaiaiaoloa

The other native resident was Keoki Mai, who was born at Pākī in Keaʻau Ahupuaʻa in 1868. In his affidavit he states that:

> …The trail or road from Olaa to Makuu is the main road upon which the *kamaaina* and strangers traveled from Makuu to the old Volcano Road, and from Olaa to Makuu. This is the main road which David Malo had described. …The trail that goes to Makuu I had gone over that road till I reached Waikahekahe, at the Ahua where the gate is now on the King Highway.
>
> Another road or trail starts from the school house at 9 miles, Olaa, and goes down to the school house at Makuu. There are piles of stone along this road. This road was made at the direction of Mr. Shipman. The road which David Malo has described, running from 12 miles Olaa, down to Makuu and meets the King Highway, is the main road or trail that was used by everybody…(in Maly 1999:123-124)

The trail discussed as the main trail or road by both David Malo and Keoki Mai is shown on Figure 10 running east (diagonally) across Keaʻau, Waikahekahe Nui, and Waikahekahe Nui *ahupuaʻa* to the old Government Road near the *mauka* boundary of the current study parcel. The trail has two different points of commencement; one that runs from Olaa School (at the 9th mile along the Volcano Road) and then on to Makuʻu, and one that runs from 12th mile to Waipahoehoe (along the Puna Road), and then on to Makuʻu.

PRIOR STUDIES

Several prior studies (archaeological and cultural) have been conducted within Makuʻu, Pōpōkī, and Hālona *ahupuaʻ*a (Table 1 and Figure 11). Many of these previous studies were conducted in the coastal portions of the *ahupuaʻa* in the immediate vicinity of the current project area (Barrera 1990; Chaffee and Spear 1993; Chavert-Pond and Rosendahl 1993; Clark et al. 2007; Clark et al. 2008; Ewart and Luscomb 1974; Hudson 1932; Komori and Peterson 1987; Rosendahl 1989; Spear et al. 1995) (see Table 1). The Ewart and Luscomb (1974) study and the Clark et al. 2008 included the current project area or portions thereof. In addition to the coastal studies, six other studies have been conducted at more inland locations within the *ahupuaʻa* (Bordner 1977; Conte et al. 1994; Desilets and Rechtman 2004; McEldowney and Stone 1991; Rechtman 2003; Yent 1983) (see Table 1). A discussion of the findings for the current project area follow below and the reader is directed to the Clark et al. (2008) inventory survey for a more thorough discussion of the archaeological studies surrounding the current project area. Subsequent to the archaeological inventory preformed by Rechtman Consulting, LLC (Clark et al. (2008), a preservation plan (Pestana et al. 2009a) and a burial treatment plan (Pestana et al. 2009b) were prepared for the current project area and are also discussed below.

Table 1. Previous studies in Makuʻu, Pōpōkī, and Hālona *ahupuaʻa*.

Author/Date	*Type of Study*	*Ahupuaʻa*
Hudson 1932	Archaeological Survey	Various
Ewart and Luscomb 1974	Reconnaissance Survey	Various
Bordner 1977	Reconnaissance Survey	Makuʻu
Yent 1983	Archaeological Survey	Makuʻu
Komori and Peterson 1987	Cultural and Biological Resource Survey	Various
Rosendahl 1989	Field Inspection	Makuʻu, Hālona, Pōpōkī
Barrera 1990	Inventory Survey	Makuʻu
McEldowney and Stone 1991	Archaeological/Environmental Survey	Various
Chaffee and Spear 1993	Burial Testing	Makuʻu
Charvet-Pond and Rosendahl 1993	Inventory Survey	Makuʻu, Hālona, Pōpōkī
Conte et al. 1994	Inventory Survey	Makuʻu, Hālona, Pōpōkī
Spear et al. 1995	Data Recovery	Makuʻu
Rechtman 2003	Archaeological Assessment	Makuʻu, Hālona
Desilets and Rechtman 2004	Inventory Survey	Makuʻu, Hālona, Pōpōkī
Clark et al. 2007	Inventory Survey	Pōpōkī
Clark et al. 2008	Inventory Survey	Makuʻu
Pestana et al. 2009a	Preservation Plan	Makuʻu
Pestana et al. 2009b	Burial Treatment Plan	Makuʻu

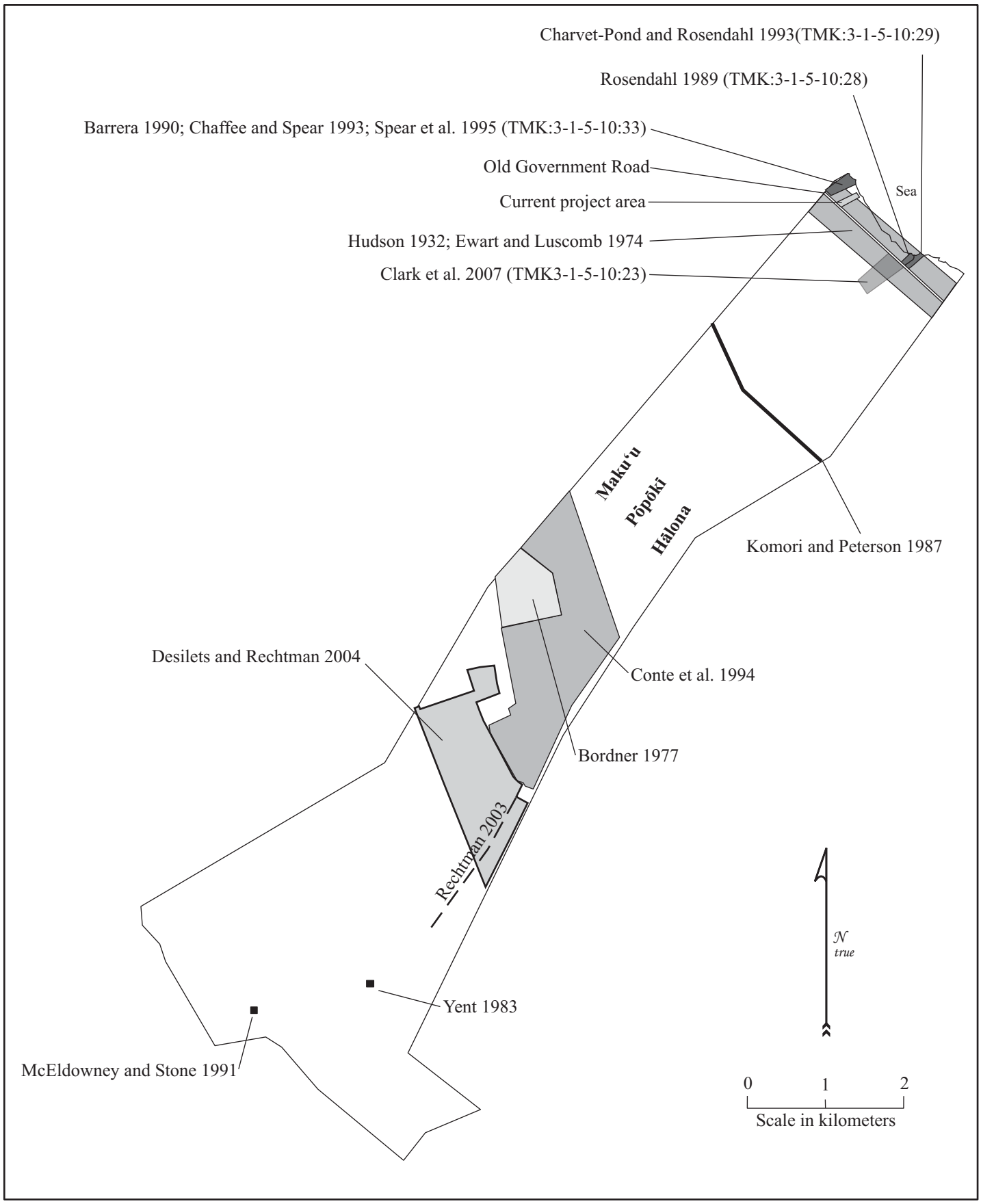


Figure 11. Distribution of prior studies in the vicinity of the current study parcel.

Ewart and Luscomb (1974) of the B. P. Bishop Museum conducted a six-mile long archaeological reconnaissance survey of a proposed Kapoho-Keaukaha Highway route through the District of Puna from Waiakahiula Ahupuaʻa to Keaʻau Ahupuaʻa. The survey area consisted of a 2,000-foot wide corridor that generally followed the route of the old Government Road which passes along the *mauka* boundary of the current project area (see Figure 10). Ewart and Luscomb (1974) briefly recorded the locations and types of numerous archaeological sites, consisting of either single features or feature complexes, in the vicinity of the current project area (Figure 11). The identified feature types included walls, mounds, petroglyphs, trails, platforms, enclosures, and modified depressions that were variously interpreted as being used for habitation, burial, agriculture, and ranching. Eight sites were located in the immediate vicinity of the current study parcel including: a large feature complex (Ha-A3-10) that is partially within the current project area; two other feature complexes (Ha-A3-7 and Ha-A3-19) located to the southeast; two burial platforms (Ha-A3-17) also located to the southeast, that are discussed as the final resting place of the original recipients of Grant No. 1013; a large feature complex located across the Government Road (Ha-A3-18); two petroglyph fields (Ha-A3-24 [SIHP Site 4222] and Ha-A3-25) located at the coast near the current project area; and a wall (A3-14) located along the old Government Road southeast of the current project area. The descriptions of each of theses sites follow below and their locations are shown in Figure 12.

Ha-A3-7

This complex includes several walls, faced areas, a mound with an upright stone, and a rock-lined well. The area has several springs, and both the well and a faced depression, or pond, presently contain water. The pond area was made recently using a bulldozer to enlarge a natural well. Mr. Tomiji Togashi constructed a wall behind the pond and modified others in the same area. A rock-lined well is the only feature that has not been modified. In general, because of the extensive and recent modification of the area, these features are of negligible archaeological value.

Ha-A3-10

This is a large complex measuring c. 250 by 100 m, with fragments of trails, several enclosures, and a variety of other features. Large, faced, flat areas may have been agricultural terraces. Collapsed lava domes have been enlarged and faced to form natural wells or protected agricultural areas. Platforms suggest house sites and would make interesting excavation features. This appears to be an extensive agricultural-habitation complex with excellent possibilities for continued research.

Ha-A3-14

A stacked wall c. 250 m long parallels the Government Trail approximately 2 m makai of it. The wall varies in height from 0.5 to 1.5 m and in width from 0.5 to 1 m. There are occasional breaks in the wall but other than that, it is in fair to good condition.

According to Mr. Kamahele, this is a kuleana wall associated with the Kamahele Mahele Grant. There is actually a complex of free-standing walls in the area which probably represent kuleana walls and could possibly be useful in ethno-historic land-tenure studies.

Ha-A3-17

These features are the graves of people who lived on the land now owned by Mr. Kamahele. The most recent burial in the area was Mr. Kamahele's maternal grandmother who died sometime before 1920. Buried in a row with her are six other individuals who represent people to whom the Mahele Grant no. 1013 was given. Covering these graves is a low platform measuring 9 by 2.7 m, and 0.30 m high.

Immediately to the northeast of the low platform is a larger platform measuring 5 by 5 m and c. 1.3 m high. According to Mr. Kamahele, this is the older of the platforms. The numbers and identities of those buried in this feature are unknown to Mr. Kamahele. Because of the nature of this site, no further work is deemed necessary at the present time.

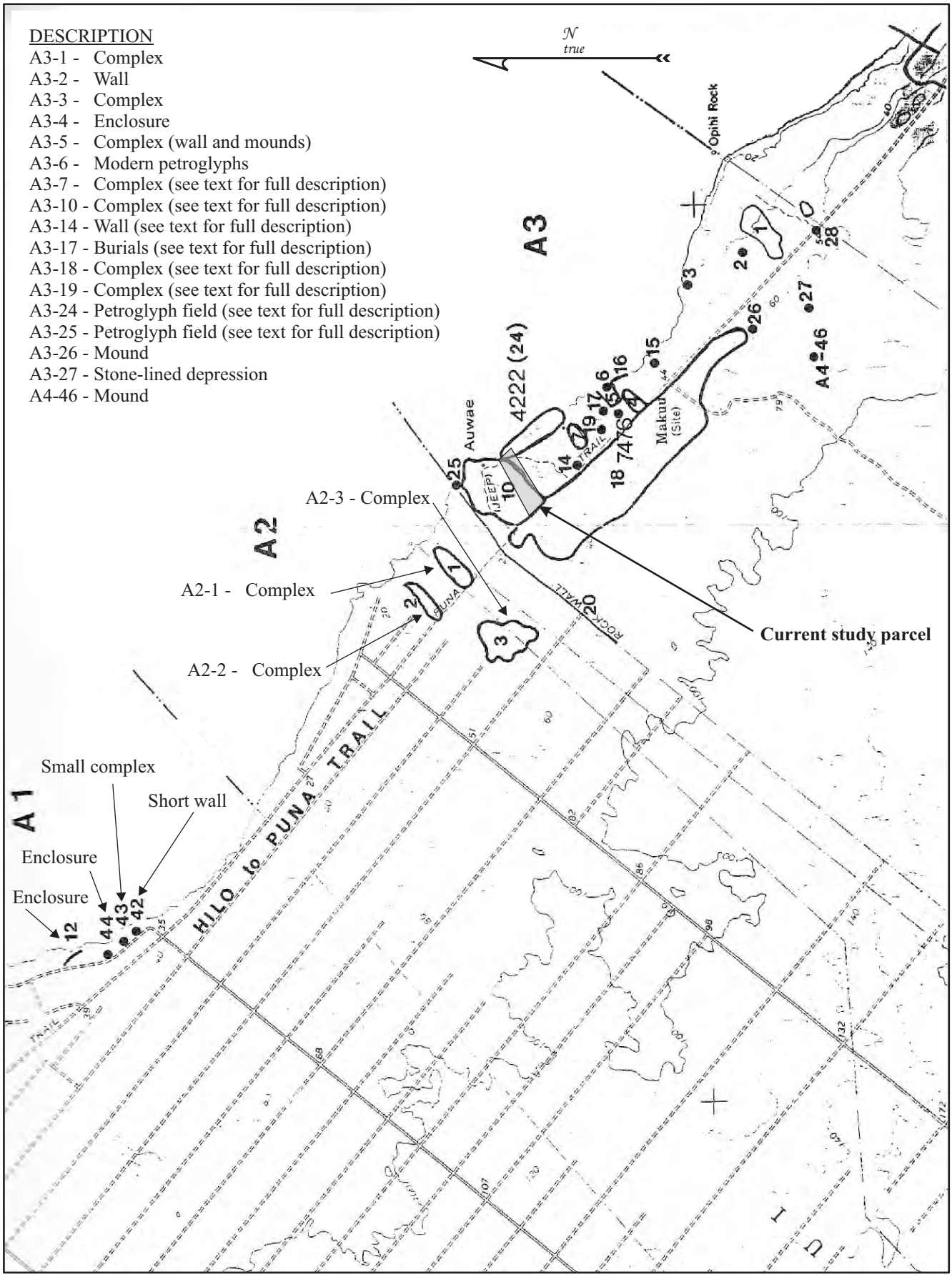


Figure 12. Ewart and Luscomb (1974) site location map showing current study parcel (annotated with A3 site descriptions).

Ha-A3-18
Site Ha-A3-18 is composed of numerous walls, enclosures, mounds, depressions, and platforms. This area does not appear to contain any nucleated settlement but rather represents dense, dispersed settlements—one or two platforms and surrounding agricultural features (faced depressions, low mounds, faced, small gullies, and enclosures of various sorts). This area presents good research possibilities as a large and extensive complex with little disturbance, although there are certainly some historic features in it.

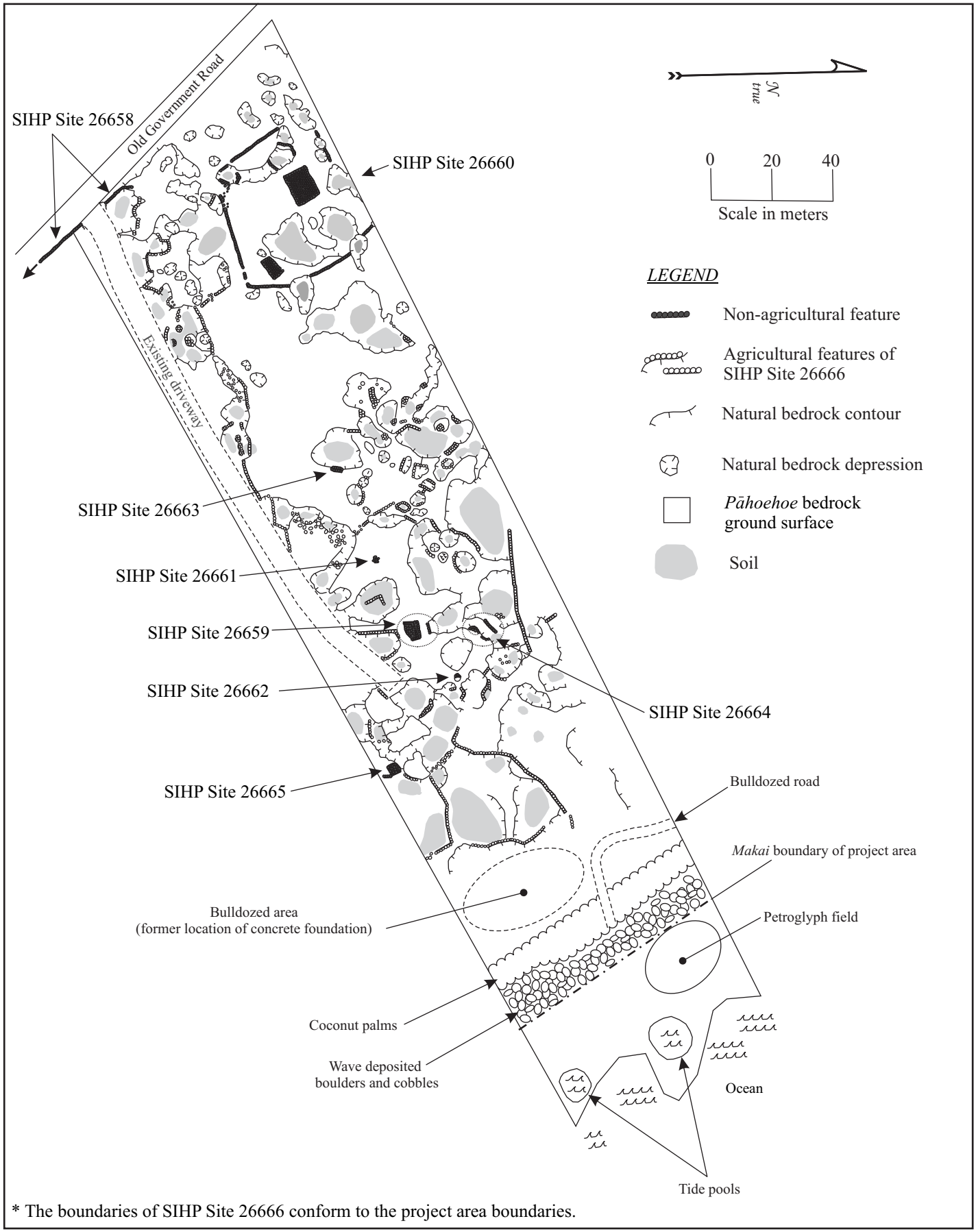
Ha-A3-19
This site consists of platforms and walls. Mr. Kamahele in December 1973 said that an enclosure here was similar to an enclosure of Site Ha-A3-10. Geographically these areas are in close proximity and originally it may have been a continuous complex. This area is of moderate value archaeologically.

Ha-A3-24
This field (not mapped because of time limitations) is located on a pahoehoe flat, approximately 5 m makai of a large breakwater formed by bulldozing beach boulders. During the construction of this breakwater Mr. Togashi noticed the field, which had been covered by large waterworn boulders. This site may be the same found by Hudson [n.d. :308] and may possibly be the Makuu petroglyph field, no. 4222 of the Statewide Inventory. Designs noticed included stick-type human figures and angular geometric designs. These petroglyphs probably predate western contact and every attempt should therefore be made to protect them as a remnant of Hawaiian culture.

Ha-A3-25
These petroglyphs are located 200 m east of Makuu-Waikahekahe ahupua'a wall on the coast at high tide line. They were found on a flat pahoehoe flow measuring 20 meters across. This field is composed of isolated letters, words, and a konane board which may be the same one mentioned by Hudson [n.d. :308]. The letters S, J, and Z appearing in these petroglyphs are unusual and may suggest that at least portions of the field are recent (20th century). [Ewart and Luscomb 1974:27-30]

Ewart and Luscomb (1974) include in their report, notes of a July 4, 1956 interview conducted by Mrs. Violet Hansen with Mrs. Mary Ann Kamahele (age 70), a member of a Hawaiian family who were the only residents of Maku'u at that time (living on Grant No. 1014; see Figure 2). Mrs. Kamahele related that she knew of a *heiau* on Grant 1013:2, located south of the current study parcel, across the Old Government Road, within the boundaries of Grant No. 1014. Ewart and Luscomb (1974:51) write, however, that they could not substantiate this claim.

In 2008, Rechtman Consulting, LLC preformed and archaeological inventory survey of the current project area (Clark et al. 2008). As a result of that survey, nine archaeological sites containing sixty-seven features were recorded within the the boundaries of the current study parcel (Table 2). The sites included a core-filled wall along the old Government Road (Site 26658), an enclosure/pavement used for Historic habitation purposes (Site 26659), a Historic habitation complex (Site 26660) containing five features including an enclosing wall (Feature A), two modified depressions (Features B and C), a pavement (Feature D), and a platform (Feature E), a modified bedrock hole used for water collection and storage (Site 26661), three concealed bedrock overhangs containing Historic burials (Sites 26662, 26663, and 26664), a Precontact burial within a platform (Site 26665), and a large agricultural complex (Site 26666) that spans the entire project area and contains fifty-five distinct features. Six test units were excavated at five of the recorded sites. The locations of each of the sites, relative to the project area boundaries, are shown on Figure 13.



* The boundaries of SIHP Site 26666 conform to the project area boundaries.

Figure 13. Archaeological sites recorded during the inventory survey of TMK:3-1-5-010:032.

Table 2. Archaeological sites recorded on the current study parcel (Clark et al. 2008).

*SIHP Site #**	*Formal Type*	*Functional Type*	*Temporal Association*
26658	Core-filled wall	Ranching/boundary	Historic
26659	Enclosure/pavement	Habitation	Historic
26660	Complex	Habitation	Historic
26661	Modified bedrock hole	Water collection/storage	Historic
26662	Concealed overhang	Burial	Historic
26663	Concealed overhang	Burial	Historic
26664	Concealed overhang	Burial	Historic
26665	Platform	Burial	Precontact
26666	Complex	Agriculture	Precontact/Historic

*All SIHP site numbers within the project area are preceded by the state, island, and quad prefix 50-10-45.

The two habitation sites (Sites 26659 and 26660) and the modified bedrock hole (Site 26661) are located on a raised linear spine of *pāhoehoe* bedrock that runs from the old Government Road to the *makai* portion of project area near the coast. This area is elevated so that it stays dry during times of heavy rain, and it provides the easiest *mauka*/*makai* pedestrian access across the parcel. The bedrock ground surface is also unsuitable for agriculture, as very little soil is present. The remaining sites and features are constructed along the north and south edges of this raised bedrock spine, or within natural, vertical sided depressions in the bedrock. Three of the depressions have overhanging edges that were blocked with walls to conceal Historic Period burials (Sites 26662, 26663, and 26664). Nearly all of the depressions contain at least thin soil, and many have been cleared and modified along their edges for planting purposes.

Evidence of Historic Period use of the project area is more prevalent at the recorded sites than Precontact Period use. Use of only one recorded site appears to date solely to Precontact times—Site 26665, a burial platform. It is likely however, that Precontact use was just as widespread, but that it was obscured by later Historic use. The features of the agricultural complex (Site 26666) appear to embody the formal attributes of both periods. These features were adapted over time, and new features were built, to suit the changing needs of the residents of this area, such as the need to keep cattle and goats out of agricultural areas. Evidence of Modern use of the project area is also widespread. Numerous plastic grow bags, fertilizer bags, plastic water bottles, and related agricultural items are littered on ground surface within the project area. Modern cultivation within the project area has likely affected some of the recorded features. Mechanical earthmoving, for the construction of the driveway and the removal of a concrete house foundation near the coast, has also negatively impacted the archaeological landscape.

In addition to the recorded archaeological sites, the presence of a petroglyph field was noted on the coastal shelf *makai* of the project area (see Figure 13). This is likely the same field recorded by Ewart and Luscomb (1974) as Site Ha-A3-25 (see above). It is covered by water at high tide, but exposed at low tide. Several names and a *papamū* are present within the field. Readable names included: KAALOKAIʻI, KEKIEI, KAAI, KAUH…?, KEOWAOWA A, ZAI, and POAHI. At least three springs appear to surface within small tide pools to the southeast of the petroglyph field, also *makai* of the current project area.

In 2009, Scientific Consulting Services, Inc. prepared an archaeological sites preservation plan (Pestana et al. 2009a) and a burial treatment plan (Pestana et al 2009b) for the current project area. The archaeological sites preservation plan was prepared for Site 26660 and specified interim preservation measures that include setting up orange construction fencing around the site to create a 20 foot buffer zone within which no development activities can take place. Permanent preservation at this site will include delineated the 20 foot buffer with either a gated fence and/or natural landscaping barrier. The burial treatment plan was prepared for Sites 26662, 26663, 26664, and 26665; and also included the non-burial site 26659. Sites 26662, 26664, and 26659 are all contained within a single preserve area that measures 40 feet x 30 feet, with a 20 foot buffer measured from the outer edges of each site. Sites 26663 and 26665 each have a buffer of 20 feet from their outer edges. In addition to the buffers around the three burial preserve areas, there is also a “no build” zone extending 10 feet from the perimeter of the 20 foot preservation buffer. Access to the burial sites by formally recognized lineal and/or cultural descendents is by prior permission from the landowner. Both of the preservation plans specify that an archaeological monitor will be present during all earth-moving activities associated with development of the parcel. Figure 14 shows the preservation buffers around the site areas.

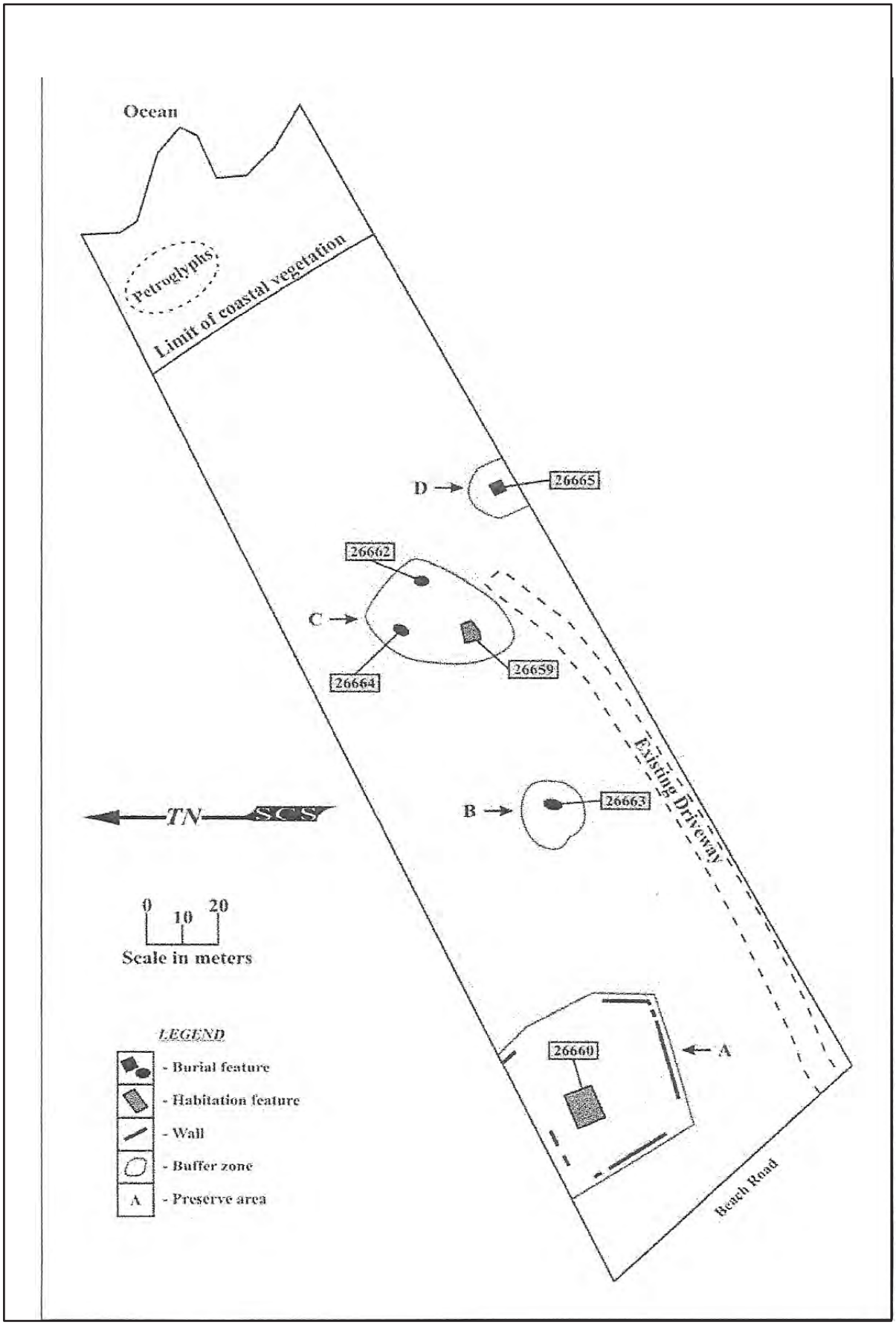


Figure 14. Map of project area showing preservation buffers (after Pestana et al. 2009a).

CONSULTATION

When assessing potential cultural impacts to resources, practices, and beliefs; input gathered from community members with genealogical ties and/or long-standing residency relationships to the study area is vital. It is precisely to these individuals for whom meaning and value are ascribed to traditional resources and practices. Community members may also retain traditional knowledge and beliefs unavailable elsewhere in the historical or cultural record of a place. As part of the current assessment the following individuals/organizations were contacted: Nicole Lui (Recognized descendant with respect to the burial treatment process), Jimmy Medeiros (Recognized descendant with respect to the burial treatment process), Richard Ha (genealogically connected to the area), and Melani Dominguez (genealogically connected to the area).

During the burial treatment planning process that was previously undertaken for the parcel, The Hawai‘i Island Burial Council formally recognized Raymond Lui, Nicole Lui, and Jimmy Medeiros as cultural descendants based on their genealogical ties to individuals once resident in Maku‘u Ahupua‘a. In a phone conversation with Nicole she explained that her immediate family (including her father Raymond) never resided in the area and thus had no knowledge of any *wahi pana* or cultural practices associated with the study parcel. Nicole did indicate that as long as the preservation measures in the burial treatment plan were followed, she had no objections to the development plan. Several attempts (via telephone and email) were made to contact Jimmy Medeiros, but none were successful.

Richard Ha was contacted by telephone. Mr. Ha’s genealogy links him to the Kamahele *‘ohana*; his grandmother’s brother was Ulrich Kamahele. As Mr. Ha relates in his online blog, “Everyone knew him (Ulrich) as Uncle Sonny, as if there was only one ‘Uncle Sonny’ in all of Hawai‘i.” In this same online blog, Mr. Ha prepared a four-part story about his life experiences at Maku‘u. Excerpt from these stories are presented to highlight life in the Maku‘u area during the middle twentieth century.

> My extended Kamahele family came from Maku‘u. When we were small kids, Pop would take us in his ‘51 Chevy to visit.
>
> He would turn left just past the heart of Pahoa town, where the barbershop is today. We drove down that road until he hit the railroad tracks, and then turned left on the old railroad grade back toward Hilo. A few miles down the railroad grading was the old Maku‘u station. It was an old wooden shack with bench seats, as I recall. That is where the train stopped in the old days. A road wound around the pahoehoe lava flow all the way down the beach to Maku‘u. That was before there were the Paradise Park or Hawaiian Beaches subdivisions.
>
> We did not know there was a district called Maku‘u; we thought the family compound was named Maku‘u. Of the 20-acre property, maybe 10 acres consisted of a kipuka where the soil was ten feet deep. The 10 acres on the Hilo side were typical pahoehoe lava. The property had a long oceanfront with a coconut grove running the length of the oceanfront. It was maybe 30 trees deep and 50 feet tall.
>
> The old-style, two-story house sat on the edge of a slope just behind the coconut grove. If I recall correctly, it had a red roof and green walls. Instead of concrete blocks as supports for the posts, they used big rocks from down the beach.
> There was no telephone, no electricity and no running water. So when we arrived it was a special occasion. We kids never, ever got as welcome a reception as we got whenever we went to Maku‘u.
>
> And the person happiest to see us small kids was tutu lady Meleana. She was my grandma Leihulu’s mom. She was a tiny, gentle woman, maybe 100 pounds, but very much the matriarch of the family. She spoke very little English but it was never an issue. We communicated just fine.

> We could not wait to go down the beach. Once she took us kids to catch ‘ohua—baby manini. She used a net with coconut leaves as handles that she used to herd the fish into the net. I don’t recall how she dried it, but I remember how we used to stick our hands in a jar to eat one at a time. They were good.
>
> She would get a few ‘opihi and a few haukeuke and we spent a lot of time poking around looking at this sea creature and that.
>
> Between the ocean in the front and the taro patch, ulu trees, bananas and pig pen in the back, there was no problem about food. I know how Hawaiians could be self-sufficient because I saw it in action.
>
> The house was full of rolls of stripped lauhala leaves. There were several lauhala trees and one was a variegated type. I don’t recall if it was used for lauhala mats but it dominated the road to the house.
>
> There were lauhala mats all over the place, four and five thick. There was a redwood water tank, and the kitchen water pipe had a Bull Durham bag on the spout as a water filter.

When asked about the proposed development Mr. Ha indicated that if the landowner adhered to the Conservation District rules and the treatment plans for the archaeological and burial sites that development of the proposed single-family residence would be fine.

An informal consultation was conducted with Melani Dominguez at her home in Kea‘au. This individual has strong genealogical ties to the area having descended from Hawaiians residing in Maku‘u dating from *Māhele* times, and likely Precontact times. Melani‘s personal recollection of the current study area extends back to the late 1970s, when she was a small girl. Melani has recollections of picking *limu* and fishing with her grandmother Theresa Kamahele down at their property on TMKs:3-1-5-10:009 and 010; Grant 1014, located southeast of the current study parcel. She also remembered hearing about a *menehune* trail that meandered through their property *mauka*/*makai*. When asked how she felt about the construction of the single-family dwelling on the current study parcel, Melani indicated that she would feel alright about the proposed development as long as no cultural sites are impacted.

POTENTIAL CULTURAL IMPACTS

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

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

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

It is however with the definition of "Property" wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often times cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Paʻakai O Kaʻāina* v. Land Use Commission court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigation actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

It is recognized that the shoreline is and has been used for both recreational and subsistence purposes (see consultation section above), and that such practices could be considered to be of a traditional cultural nature. While no specific activities were identified for the shoreline fronting the study parcel, strict adherence to shoreline setbacks will ensure that the proposed development of the parcel will not affect existing shoreline access, and thus there will be no impact on any potential shoreline-related traditional practices. Likewise, based on the archival research or oral consultations, there were no traditional cultural practices identified specific to the current study parcel. There are however several cultural resources (former residential and burial sites) that have been documented (Clark et al. 2008) to exist within the boundary of the current study parcel.

To mitigate potential impacts to the identified archaeological and burial sites, the DLNR-SHPD approved archaeological sites preservation plan (Pestana et al. 2009a) and burial treatment plan (Pestana et al. 2009b) will be implemented prior to the commencement of any development activities. Execution of these mitigation measures will help to ensure that no cultural practices and beliefs or associated cultural resources will be adversely affected by the proposed development of a single-family residence on TMK:3-1-5-010:032.

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ENVIRONMENTAL ASSESSMENT

GAPP SINGLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT AT MAKU‘U

APPENDIX 4
Coastal Erosion Study

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GCI

GEOHAZARDS CONSULTANTS INTERNATIONAL, INC.

Appraisal of hazards - reduction of risk

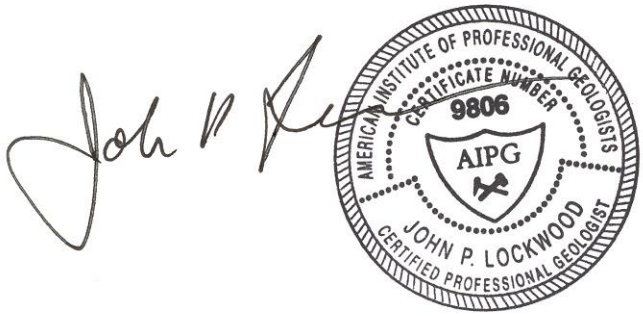
COASTAL EROSION STUDY

John & Maureen Gapp Property

(South of Hawaiian Paradise Park, Hawaii)

TMK: (3) 1-5-010:32

John P. Lockwood, Ph.D., CPG No. 9806



March, 2012

Introduction:

The Hawaii DLNR Hawaii Administrative Rules, Chapter 13-5 (Adopted August 12, 2011) states that for Single Family Residential construction in coastal Conservation Districts, Applicants must consider rates of coastal erosion affecting their properties, in order to determine minimum shoreline setbacks for permitting. DLNR established a requirement that Annual Coastal Erosion Rates must be determined, based on formal "Coastal Erosion Studies". This report documents the nature of erosion and shoreline migration at the Gapp property, based on a field inspection and office study of appropriate aerial photography, satellite imagery, and geologic literature.

Field Inspection information:

Date of inspection:	26 February, 2012
Time:	11:00-13:00 HST
Ocean tide state (approximate[1]):	+0.1 ft.
Sea state:	Moderate northeast waves and swells

Physical Setting – Geologic environment:

The Gapp Property (TMK: (3) 1-5-010:32 – hereafter "the Property") fronts on the ocean for about 100 yards about three miles southeast of Kaloli Point. The entire coastline is underlain by relatively young pahoehoe lava flows from Kilauea volcano, labeled as unit f8d4 on the geologic map of Moore and Trusdell (1991), with estimated average radiocarbon ages of 335 yrs b.p. Because of their young ages, the undisturbed surfaces of these flows are marked by surface textures and basaltic glass that serve as good markers for determination of erosion effects. These flows are dense and relatively non-vesicular, and thus are resistant to mechanical erosion. The flows are near horizontal in this area – dipping toward the sea at only about 1-2 degrees, and forming a coastal platform that is partially inundated by highest tides (Figure 1).

[1] From DLNR 2012 Tide Calendar and NOAA Website: www.tideasandcurrents.noaa.gov.

Figure 1. Coastal platform showing near-horizontal surface of lava flows, with storm-emplaced boulders in the foreground.

Findings:

Because of land subsidence, sea level rise and the fact that the lava flows were relatively thin where they entered the sea, no significant sea cliff has developed along the coast fronting the Property. Ocean-facing cliffs were only only 1-2 feet above sea level when inspected, and incoming waves flowed gently over pahoehoe surfaces as tides rose , causing no erosion by normal wave activity.

A 10-12 foot high berm of storm-carried boulders located 75-150 feet inland from the coastal cliff face forms a barrier to storm wave activity, and coincides with the lowest level of coastal vegetation (hala, naupaka, and coconut palms). Individual boulders thrown inland by storm waves or tsunamis were found up to 50 feet onshore from the vegetation line, but are covered by dense vegetation and are not recent in origin. The degree of rounding of these boulders in the coastal berm indicates that most have been in place for a long time, as they are rounded by wave action, and are not derived by recent erosion of the coastline (Figure 2). Angular boulders (indicative of recent erosion by wave action) constituted only about 3% of all boulders. The distribution of boulder shapes is shown in Table 1.

Table 1: Shapes of storm-boulders along coastal berm (visual estimates)

Boulder Shape	Approximate percentage
Well-Rounded	15%
Sub-rounded	70%
Sub-angular	12%
Angular	3%

Figure 2. Coastal boulder berm and vegetation line fronting the Property.

Erosion Rate:

At the coastal front of the Property significant changes in shoreline position (as defined by Boak and Turner (2005) and Hwang, 2005) have been caused primarily by land subsidence and global sea level rise rates, and not by erosion. Inspection of aerial photographs dating back to 1954 (Table 2) revealed no discernible changes in the positions of the sea cliff nor of the vegetation-defined shoreline, but the large photo scales and variable tide positions between photograph pairs could obscure small changes. Determination of global secular sea level rise is complex and highly variable, owing to local and temporal variations, but is estimated at 1 mm/yr over the long term (Fletcher and others, 2010 – Chapter 9). Land subsidence in east Hawaii was estimated at 4.8 mm/yr by Moore, 1970, although it is much greater (8-17 mm/yr) 12 miles to the east in the Kapoho area (Hwang. 2007). Additionally, catastrophic, sudden tectonic events can cause great local subsidence (Lipman and others, 1985) in specific areas. In their description of the hazards facing this area, Fletcher and others (2002) state that the land in this area "sank and was inundated by a locally generated tsunami after a 4.1 earthquake rocked the southeast portion of the island [in 1868].

The fact that Hawaiian petroglyphs and lava flow surface structures and glass survive on the intertidal pahoehoe platform (Figure 3) attests to the fact that surface erosion of the pahoehoe is negligible, although marine algae covering some petroglyphs (Figure 4) demonstrate that land subsidence relative to sealevel is occurring. Minor lateral erosion does take place by hydraulic ramming of storm waves into sub-horizontal interflow contacts, and have the power to lift massive subangular boulders onto

the coastal intertidal platform (Figure 5), but the rarity of such blocks inshore shows this is an infrequent event. In one area fronting the Property, angular surfaces on one flow remnant showed that mechanical erosion had occurred at the base of the coastal boulder berm, but the presence of petroglyphs within 3 feet of this broken area defined the maximum extent of any erosion as less than three feet in the period since the petroglyphs were made. All petroglyphs observed consist of European-influenced alphabetic characters, of probable mid-nineteenth century age.

Figure 3. Post-European contact age petroglyphs exposed in the intertidal zone, indicating lack of erosion.

Effect of Subsidence and Sea Level Rise on shoreline:

As indicated above, the impact of mechanical erosion on the coastal shoreline at the Property is negligible, involving occasional mechanical dislocation of lava blocks from coastal sea cliffs during

major storm events, without quantifiable effect on shorelines. The combined effect of land subsidence and global sea level rise (likely about 5mm/yr at this site) could, however, substantially impact shoreline positions on these near-horizontal lava flows (Figure 1) were it not for the presence of the coastal boulder berm (Figure 2). The position of this berm and the vegetation growing at its crest appear to be form a stable barrier to lateral transgression of rising seas – at least over the short term, or until major tectonic events like 1868 or future major tsunami waves impact the coastal berm.

General Coastal Zone Hazards at this Property:

Fletcher and others (2002, p. 149) rate this area of the Puna coastline to be high (6 on a 1-7 scale), with specific hazards rated as follows (Table 3):

Hazard Type	Relative Hazard	Scale (1-4)
Tsunami	High	4
Stream Flooding	Medium-high	3
High Waves	Medium-low	2
Storms	High	4
Erosion	Medium-low	2
Sea Level change	High	4
Volcanic / seismic	High	4

Figure 4. 19th century petroglyph partially covered with marine algae in the intertidal zone. This demonstrates significant land subsidence since the arrival of Europeans in Hawaii.

Figure 5. Large angular boulders on the intertidal platform fronting the property. The boulder in the foreground is about three feet in length.

Table 2. Aerial photographs and imagery inspected

Date	Agency	Flight Line	Frames	
1954 (November 12)	USN-USGS	017	116, 117	
1965 (February 06)	USDA	EKL-12CC	31, 32	
1977 (February 19	USGS	GS-VEEC-6	120, 121	
2012	Google Earth			

Summary:

Stereographic inspection of aerial photographs taken in 1954, 1965, and 1977 (Table 2) and comparison with recent Google Earth views revealed no changes in the position of rocky shorelines, of the coastal boulder berm, nor of the vegetation line during this 58 year period. Scale limitations of the aerial photographs inspected make identification of individual ocean-facing rock outcrops impossible, but it is probable that some individual rocks have been broken from the wave impact impact zone during this time period, but no measurable overall erosion has taken place.

Any future changes in shoreline position will be related to relative change of sea level in the area, and not to erosion.

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