FINAL ENVIRONMENTAL ASSESSMENT

Pu‘u Nana Estates Subdivision

TMK: (3rd) 7-1-05:04
Pu‘uanahulu, North Kona District, Hawai‘i Island, State of Hawai‘i

August 2008

Prepared for:
County of Hawai‘i
Planning Department
Aupuni Center, Suite 3
101 Pauahi Street
Hilo, HI 96720

FINAL ENVIRONMENTAL ASSESSMENT

Pu‘u Nana Estates

TMK: (3rd) 7-1-05:04
Pu‘uanahulu, North Kona District, Hawai‘i Island, State of Hawai‘i

August 2008

APPLICANT:

Rod Imming
75-346 Hualalai Road #B105
Kailua-Kona HI 96740-7944

APPROVING AGENCY:

County of Hawai‘i
Planning Department
101 Pauahi Street, Suite 3
Hilo HI 96720

CONSULTANT:

Geometrician Associates LLC
PO Box 396
Hilo HI 96721

CLASS OF ACTION:

Use of State Land

This document is prepared pursuant to:

The Hawai‘i Environmental Policy Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules (HAR).

TABLE OF CONTENTS

SUMMARY ii
PART 1: PROJECT DESCRIPTION, LOCATION, AND E.A. PROCESS 1
1.1 Project Description, Location and Property Ownership 1
1.2 Environmental Assessment Process 1
1.3 Public Involvement and Agency Coordination 8
PART 2: ALTERNATIVES 9
2.1 Proposed Action 9
2.2 No Action 9
PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES 10
3.1 Physical Environment 10
3.1.1 Climate, Geology, Soils and Geologic Hazards 10
3.1.2 Drainage, Water Features and Water Quality 11
3.1.3 Flora, Fauna, and Ecosystems 11
3.1.4 Air Quality, Noise and Scenic Resources 14
3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions 15
3.2 Socioeconomic and Cultural 15
3.2.1 Socioeconomic Characteristics 15
3.2.2 Cultural and Archaeological Resources 17
3.3 Infrastructure 20
3.3.1 Utilities 20
3.3.2 Roadways 20
3.4 Secondary and Cumulative Impacts 21
3.5 Required Permits and Approvals 21
3.6 Consistency With Government Plans and Policies 22
3.6.1 Hawai‘i State Plan 22
3.6.2 Hawai‘i County SMA, Zoning and General Plan 22
3.6.3 Hawai‘i State Land Use Law 27
PART 4: DETERMINATION 27
PART 5: FINDINGS AND REASONS 27
REFERENCES 30

LIST OF TABLES

TABLE 1 Plant Species Identified on Project Site 12
TABLE 2 Selected Socioeconomic Characteristics 16

LIST OF FIGURES

FIGURE 1 General Location Map 2
FIGURE 2 TMK Map 3
FIGURE 3 Project Site Photo 4
FIGURE 4 Airphoto 5
FIGURE 5 Subdivision Plan 6
FIGURE 6 Driveway Detail 7

LIST OF APPENDICES

APPENDIX 1a Comments in Response to Pre-Consultation and Selected Pre-EA Correspondence
APPENDIX 1b Comments to Draft EA and Responses
APPENDIX 2 Archaeological Inventory Survey and SHPD Correspondence

SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Rodney Imming (the applicant) plans to develop a 6-lot subdivision in Pu‘uanahulu on 6.8 acres of land zoned for agriculture. The lots, one of which already contains a house, would vary in size from 1.00 to 1.42 acres and would be located within an area of existing agricultural zoning with lots of similar size that are primarily used for residences. Road access would be from two driveways on State Highway 190 that would be improved to meet the Department of Transportation requirements. The lots would be provided with electricity and telephone service from existing lines located on Highway 190 and at the back of the property. Water service would be provided from the Napu‘u Water Company from an extension of lines that are within an easement in the applicant’s and neighboring properties.

This former ranching property surrounded by rural residences does not contain any sensitive biological resources other than the native birds typical of this area, harm to which can be minimized through educational materials to lot owners that will be provided upon sale of the lots. One historic site, a historic and possibly prehistoric burial complex, is present near the existing residence, will not be affected by the proposed action, and is being protected through a burial treatment plan. In the unlikely event that additional archaeological resources or human remains are encountered during future development activities, work in the immediate area of the discovery will be halted. The applicant has received approval for the driveway design from the Department of Transportation and has committed to minor grading and vegetation removal within the highway right-of-way and adjacent land to improve sight distance to acceptable levels to minimize highway ingress and egress safety concerns.

PART 1: PROJECT LOCATION, DESCRIPTION, AND ENVIRONMENTAL ASSESSMENT PROCESS

1.1 Project Description, Location and Property Ownership

Rodney Imming (the applicant) plans to develop a 6-lot subdivision in Puʻuanahulu on 6.8 acres of land zoned for agriculture (Figures 1-3). The lots, one of which already contains a house, would vary in size from 1.00 to 1.42 acres (Figure 5) and would be located within an area of existing agricultural zoning with lots of similar size that are primarily used for residences (Figure 5). Road access would be from two driveways on State Highway 190 that would be built to Department of Transportation requirements (Figure 6). The lots would be provided with electrical and telephone service from existing lines located within the right-of-way of Highway 190 and at the back of the property (the existing home already has service). Water service would be provided from the Napuʻu Water Company from an extension of lines that are within an easement in the applicant's and neighboring properties.

The applicant obtained tentative subdivision approval from the County of Hawaiʻi on November 25, 2003, and since that time has been working to satisfy the conditions necessary to obtain final subdivision approval. The subdivision's amended final plat map received County approval on April 13, 2006, and the applicant is in the process of confirming water service and other County conditions. Mr. Imming was informed by the Hawaiʻi State Department of Transportation (DOT) that due to the location within the right-of-way of State Highway 190 of the proposed driveway and electricity connections, these connections and any associated non-exempt development would be subject to Chapter 343, HRS, Hawaiʻi's Environmental Impact Statement law. As the development of a subdivision is not an exempt action, an Environmental Assessment (EA) is required. It should be noted that prior to DOT's institution of this policy in June 2007 in response to a revised interpretation of Chapter 343, a subdivision with appropriate zoning in the State of Hawaiʻi generally needed only Subdivision Plan Approval and various building permits to be developed.

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 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; Part 5 lists each criterion and presents the findings for each made

Figure 1
General Location Map

Figure 2
TMK Map

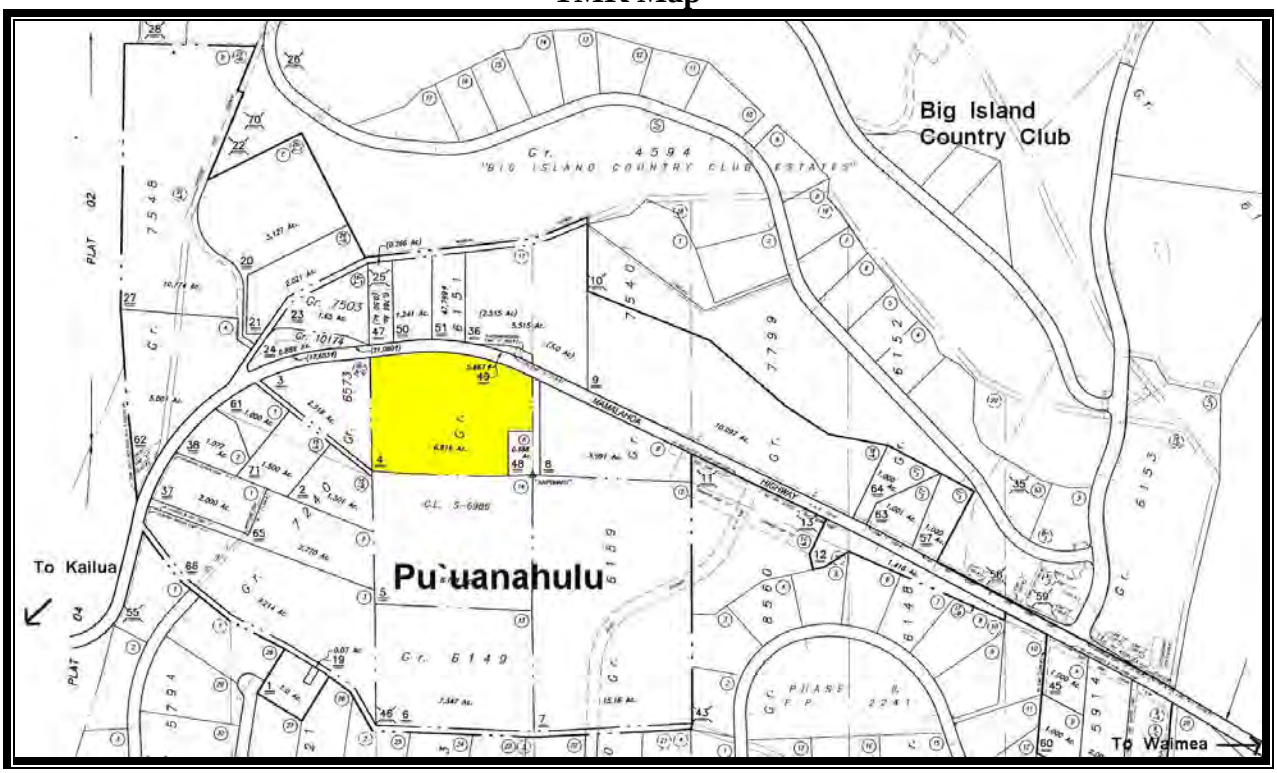
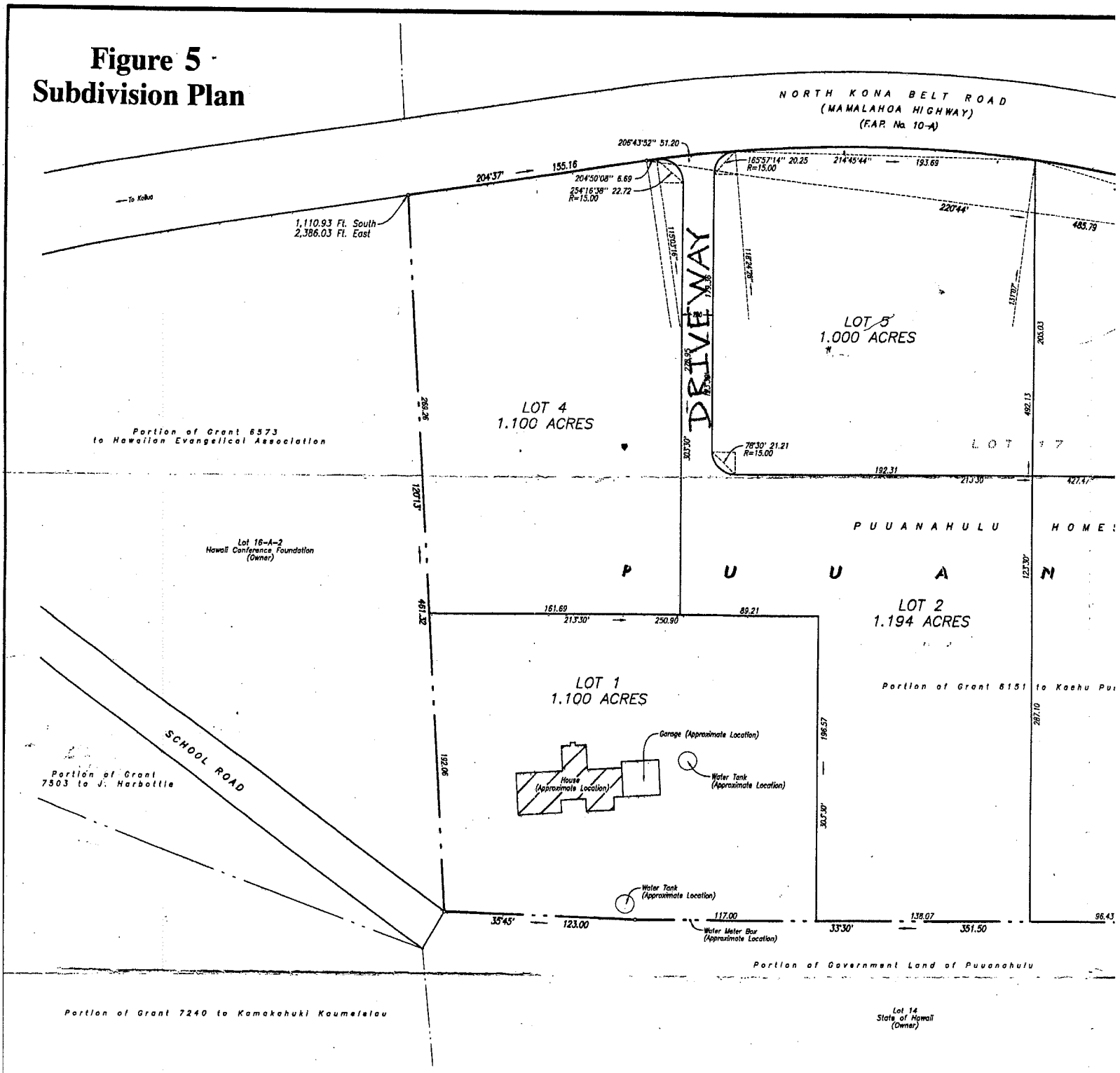


Figure 3
Project Site Photos

Figure 4
Airphoto

Figure 5
Subdivision Plan



PRELIMI

MAP SHO
SUBDIVISIO
A PORTION O
OF PUUANAHULU

Being a Po
Grant 6151 to Kaeh

INTO LOTS 1 TO

At Puuanahulu,
Island and County of Ha

NOTES:

1. Azimuths and coordinates are referred to Government Survey Triangulation Station "PUU PANINI".
2. Names of owners of adjoining parcels are from available Tax Map records.
3. The features, shown hereon, are approximate location only and have not been located by a field survey.
4. Subject Parcel is located in Zone X (areas determined to be outside the 500-year flood plain) as per Flood Insurance Rate Map (F.I.R.M.) Community-Panel Number 155166 0525 C," revised June 2, 1995.

40 20 0 40 80 120
SCALE IN FEET

Prepared For:
RODNEY C. IMMING (SUBDIVIDER)
75-6081 Alii Drive, #GG103
Kailua-Kona, Hawaii 96745
JOHN H. JUDD AND WIFE GAIL C. (OWNERS)
P.O. Box 1124
Kailua-Kona, Hawaii 96745

Page 6a

TRUE NORTH
SCALE: 1 INCH = 40 FEET

SIGHT DIST. ADJ.

236°51' 35.48

236°51' 6.07

88°57' 15.94
R=15.00

29.41

LOT 6
1.000 ACRES

R=975.00

121°03'

110.01

30°03'

DRIVEWAY

SITE DIST. ADJ.

167°16'30" 21.66
R=15.00

235.16

220.92

ESTEADS

A H U L U

LOT 3
1.422 ACRES

Purdy Makaai

31°03' 100.00

30°03'

183.08

Lot A
Kerry Humble, et al.
(Owners)

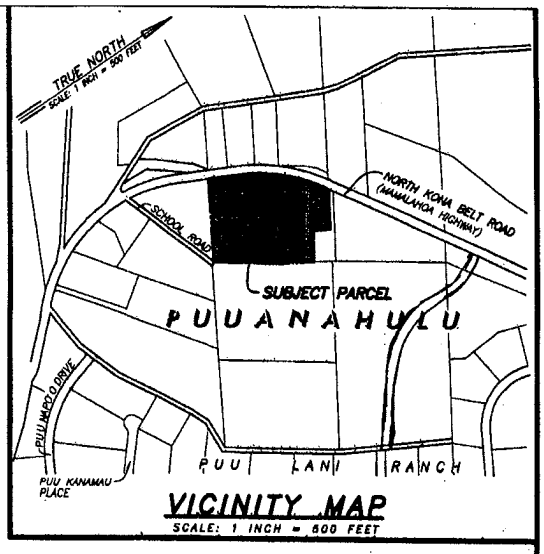
Lot B

Portion of Grant 7540 to Kaimu Kihe

96.43

29°17' 84.55

Portion of Grant 6159 to J.P. Cundell,
Administrator of the Estate of J.W. Kaumelelau



VICINITY MAP
SCALE: 1 INCH = 800 FEET

MINARY

HOWING
SION OF
OF LOT 17
U HOMESTEADS

Portion of
ehu Purdy Makaai

O 6, INCLUSIVE

u, North Kona
Hawaii, State of Hawaii

CHRYSTAL T. YAMASAKI
LICENSED PROFESSIONAL LAND SURVEYOR
No. 4331
HAWAII, U.S.A.

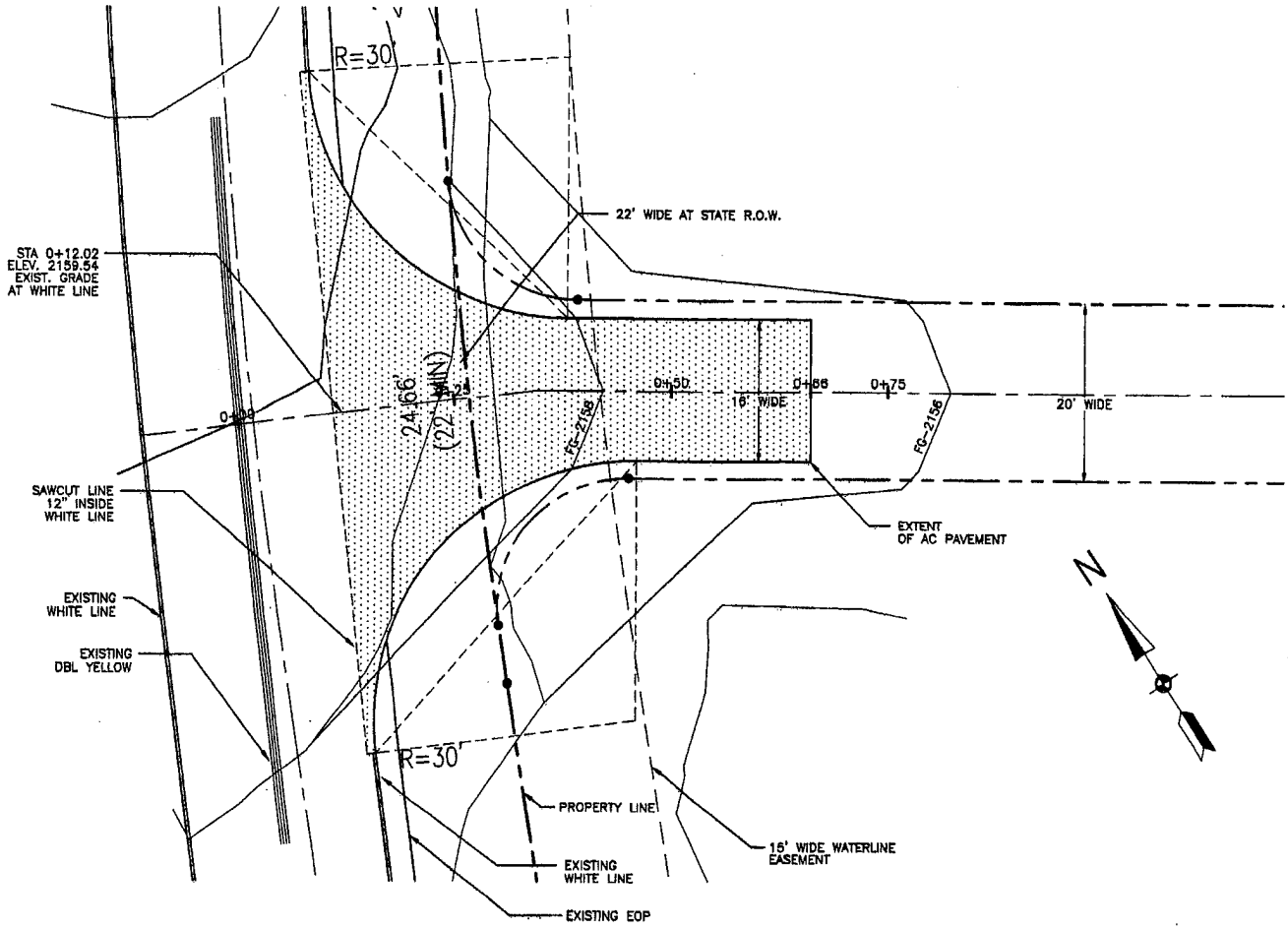
This map was prepared by me or under my direct supervision.

CHRYSTAL THOMAS YAMASAKI
Licensed Professional Land Surveyor
State of Hawaii Certificate Number LS-4331

Prepared By:
WES THOMAS ASSOCIATES
— Land Surveyors —
75-5749 Kalawa Street
Kailua-Kona, Hawaii 96740-1817
TEL. (808) 329-2353
FAX (808) 329-5334 EMAIL surveys@wtahawaii.com

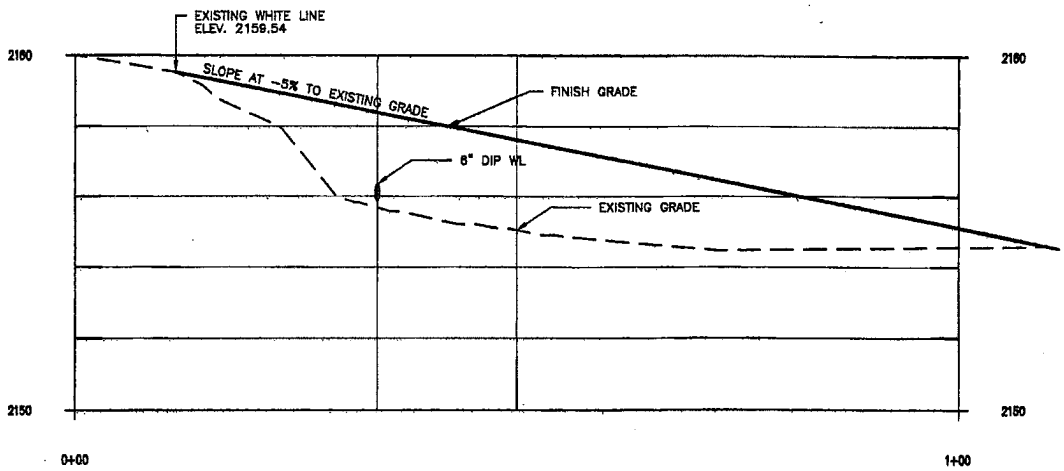
Page 6b

PROJECT NO.: 01737.1
DATE: .....AUGUST 11, 2003
FIELD BOOK NO.:..
TAX MAP KEY: ....7-1-05:04 (3RD DIVISION)



DRIVEWAY A PLAN AND PROFILE

SCALE:. HORIZ 1" = 10'
VERT 1" = 2.5'



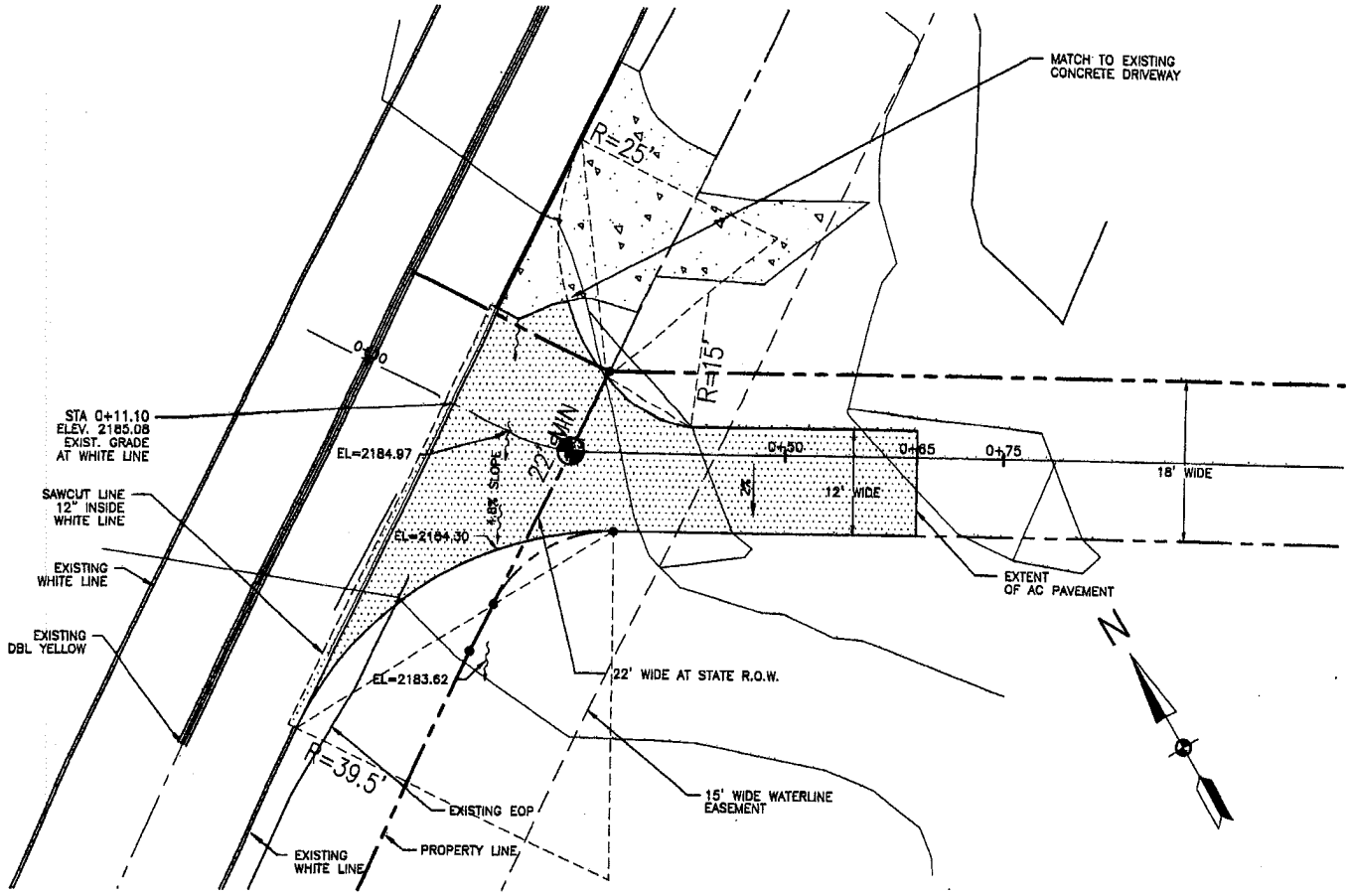
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY DIRECT SUPERVISION AS DEFINED UNDER SECTION 16-115-2 OF HAR (HRS 464-1 TO 8)

BRUCE A. BUCHER
LICENSED PROFESSIONAL ENGINEER
LIC. EXP. 4/30/96
NO. 5886-C
HAWAII

SIGNATURE DATE

Page 7a

75-5
Kailu
(808)



DRIVEWAY B PLAN AND PROFILE

SCALE: HORIZ 1" = 10'
VERT 1" = 2.5'

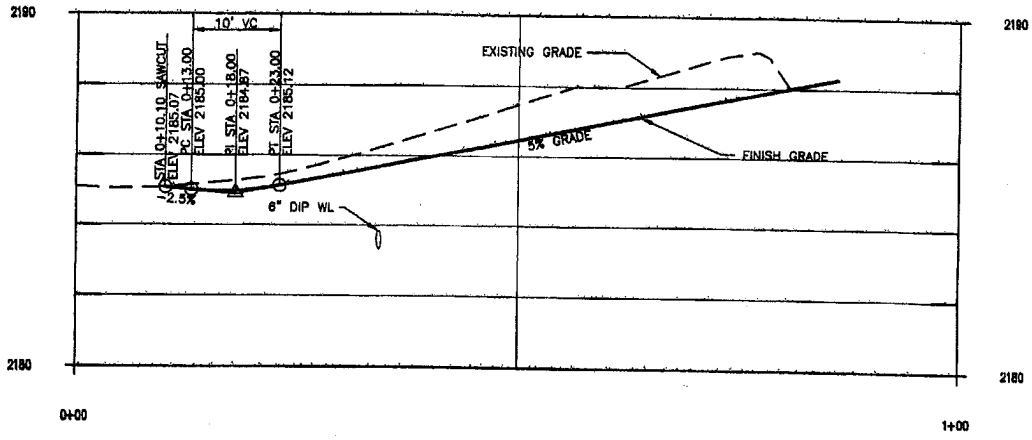


Figure 6
Driveway Details

WITCHER ENGINEERING LLP
uakini Hwy, Ste. 106
ıa, Hawaii 96740
-0322
Consulting Civil Engineers
Construction Managers

REVISIONS
NUMBER DATE APPROVED

Drawing: H:\DEN

Page 7b

by the County of Hawai‘i Planning Department, the approving agency. If, after considering comments to the Draft EA, the approving agency 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 occur. If the agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) will be prepared.

1.3 Public Involvement and Agency Coordination

The following agencies and organizations were consulted in development of the environmental assessment:

State:

- Department of Land and Natural Resources
- Department of Health
- Department of Transportation
- Office of Hawaiian Affairs

County:

- Planning Department
- Department of Public Works
- Department of Environmental Management
- Department of Water Supply
- Police Department
- County Council

Private:

- Hawai‘i Island Chamber of Commerce
- Sierra Club
- Kona Outdoor Circle
- Kona Hawaiian Civic Club
- Pu‘uanahulu Community Association
- Pu‘u Lani Homeowners Association
- Pu‘uanahulu Baptist Church
- Neighboring residents/landowners

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.

PART 2: ALTERNATIVES

2.1 Proposed Action

The action under consideration is development of a 6-lot subdivision with electricity and driveway access connections to State Highway 190 (Mamalahoa Highway) right-of-way, which will be called the *proposed action* in this document.

2.2 No Action

Under the No Action Alternative, the approval for work in the State Highway right-of-way would not occur and the applicant would be denied the use of highway right-of-way for electrical and driveway access to his subdivision. The applicant would need to seek access by acquiring easements from other properties. Alternate telephone and electrical power arrangements involving power poles and lines from the back of the property could be arranged. Such arrangements would be an inconvenience and expense to the applicant and would provide no benefit to any public or private party. The applicant considers the No Action Alternative undesirable and inequitable.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The Puʻu Nana Estates subdivision is referred to throughout this EA as the *project site*. The term *project area* is used to describe the general environs in this part of North Kona.

The project site is a 6.8-acre parcel located at an elevation of 2,100 to 2,200 feet above sea level mauka of State Highway 190 in Puʻuanahulu, North Kona. Adjacent land is primarily residential, with scattered agricultural uses and undeveloped lots. The vegetation of the project area has been previously disturbed by residential activities related to post-contact homesteading and ranching.

3.1 Physical Environment

3.1.1 Climate, Geology, Soils and Geologic Hazards

Environmental Setting

The climate in the area is mild and semi-arid, with an annual rainfall averaging about 20-30 inches (U.H. Hilo-Geography 1998:57). The average daily temperature is approximately 75 degrees F, with an average minimum of 62 degrees. Geologically, the project site is located on the flanks of Hualālai Volcano, and the surface consists of basalt lava dated more than 10,000 years before the present (Wolfe and Morris 1996). The project site soil is classified by the U.S. Natural Resources Conservation Service (formerly Soil Conservation Service) as Puu Pa extremely stony, very fine sandy loam (PVF3). This severely eroded, well-drained soil is typically found up to 3 inches thick with roughly 8.5 percent of its surface area covered with stones and boulders. Its capability subclass is VIIIs, which means that this soil has very severe limitations that make it unsuited for cultivation and restrict its use to mainly pasture and woodland or wildlife (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the United States Geological Survey in this area of North Kona is zone 4, on a scale of ascending risk from 9 to 1 (Heliker 1990:23). The hazard risk is based on the fact that Hualālai has steep slopes and is the third most historically active volcano on the island. In terms of seismic risk, the entire Island of Hawaiʻi 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 area, and the proposed action is not imprudent to construct. This level of volcanic hazard is shared by most of the Big Island. Appropriate seismic standards would be followed during any building construction, per building codes.

3.1.2 Drainage, Water Features and Water Quality

Existing Environment

The project area has no streams, ponds, lakes, wetlands or other surface water bodies. The Flood Insurance Rate Maps (FIRM) show that the project site is in Flood Zone X, outside the 100-year floodplain. No known areas of local (non-stream related) flooding are present.

Impacts and Mitigation Measure

Because improvements are limited to driveway connections and utility hookups within a very small area, there would be negligible additional risks for flooding or impacts to water quality associated with the proposed action. The home-building that would be facilitated by the use of State right-of-way would be required to follow applicable County regulations and policies related to drainage, which require the difference between pre-development and post-development runoff to be contained onsite, limiting impacts.

3.1.3 Flora, Fauna and Ecosystems

Existing Environment

The vegetation on the property is typical of abandoned pastureland, as verified during a botany survey by Patrick Hart, Ph.D., and Ron Terry, Ph.D., in January 2008. The most common species on the property are the legume *Neonotonia wightii* and the olive tree (*Olea europea* var. *cuspidata*). Also common are a variety of grasses, including guinea grass (*Panicum maximum*) and buffel grass (*Cenchrus ciliaris*). Black-wattle (*Acacia mearnsii*), silk oak (*Grevillea robusta*), and prickly pear or panini (*Opuntia ficus-indica*) are also present. Roadside verges include a number of weeds including various amaranths and asters. Two common natives, ‘uhaloa (*Waltheria indica*) and popolo (*Solanum americanum*), were identified during the botany survey. A full list of species is contained in Table 1.

No listed or proposed threatened or endangered plant species (USFWS 2007) were found on the project site. In terms of conservation value, no botanical resources requiring special protection were present.

Table 1
Plant Species Identified on Project Site

Scientific Name	**Family**	**Common Name**	**Life Form**	**Status**
Abutilon grandifolium	Malvaceae	Hairy abutilon	Shrub	A
Amaranthus spinosus	Amaranthaceae	Spiny amaranth	Herb	A
Amaranthus viridis	Amaranthaceae	Slender amaranth	Herb	A
Bidens pilosa	Asteraceae	Beggar's tick	Herb	A
Cenchrus ciliaris	Poaceae	Buffel grass	Grass	A
Chenopodium carinatum	Chenopodiaceae	Chenopodium	Shrub	A
Chenopodium murale	Chenopodiaceae	Lamb's quarters	Shrub	A
Crotalaria sp.	Fabaceae	Rattlepod	Herb	A
Eleusine indica	Poaceae	Wire grass	Grass	A
Eragrostis pectinacea	Poaceae	Carolina lovegrass	Grass	A
Euphorbia heterophylla	Euphorbiaceae	Kaliko	Herb	A
Grevillea robusta	Proteaceae	Silk oak	Tree	A
Jacaranda mimosifolia	Bignoniaceae	Jacaranda	Tree	A
Lantana camara	Verbenaceae	Lantana	Shrub	A
Malva parviflora	Malvaceae	Cheeseweed	Herb	A
Malvastrum coromandelianum	Malvaceae	False mallow	Herb	A
Neonotonia wightii	Fabaceae	Glycine	Vine	A
Nicandra physalodes	Solanaceae	Apple of Peru	Shrub	A
Olea europaea subsp. cuspidata	Oleaceae	African olive	Tree	A
Opuntia ficus-indica	Cactaceae	Panini	Shrub	A
Panicum maximum	Poaceae	Guinea grass	Herb	A
Parthenium hysterophorus	Asteraceae	Santa Maria	Herb	A
Pennisetum clandestinum	Poaceae	Kikuyu grass	Herb	A
Ricinus communis	Euphorbiaceae	Castor bean	Shrub	A
Schinus molle	Anacardiaceae	Pepper tree	Tree	A
Senecio madagascariensis	Asteraceae	Fireweed	Herb	A
Sida rhombifolia	Malvaceae	Cuba jute	Herb	A
Solanum americanum	Solanaceae	Glossy nightshade	Shrub	I
Sonchus oleraceus	Asteraceae	Sow thistle	Herb	A
Tithonia diversifolia	Asteraceae	Tree marigold	Shrub	A
Waltheria indica	Sterculiaceae	'Uhaloa	Herb	I
Xanthium strumarium	Asteraceae	Cocklebur	Shrub	A

Notes: Alien (A), Indigenous (I)

Fauna

The mammalian fauna of the project area is composed of mainly introduced species, including small Indian mongooses (*Herpestes a. auropunctatus*), goats (*Capra h. hircus*), roof rats (*Rattus r. rattus*), Norway rats (*Rattus norvegicus*), European house mice (*Mus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*). None are of conservation concern and all are deleterious to native flora and fauna.

There is also likely some foraging use of the project site by the State's only endemic mammal, the Hawaiian Hoary Bat (*Lasiurus cinereus semotus),* which is also listed as an endangered species. Hawaiian hoary bats are now regularly seen foraging over one or more of the water features on the nearby golf course on a seasonal basis (R. David, 2008, pers. comm. to R. Terry). The project area has limited habitat value for native birds and is mostly utilized by introduced species. Introduced bird species observed on the site or in nearby areas during site visits include Northern Cardinals (*Cardinalis cardinalis*), Common Mynas (*Acridotheres tristis*), House Finches (*Carpodacus c. mexicanus*), Zebra Doves (*Geopila striata*), wild turkeys (*Meleagris gallopavo*), Chestnut-Bellied Sandgrouse (*Pterocles exustus*), Skylark (*Alauda arvensis*) Erckel's francolin (*Francolinis erckelli*), and Japanese White-eyes (*Zosterops japonicus*). Also reported by a neighboring resident (see Appendix 1 for letter) are the introduced species Kalij Pheasant (*Lophura leucomelanos*).

Some native species are present as well. Noted during field visits on the project site margins (but not on the site itself) was the native migratory waterfowl, the Pacific Golden Plover (*Pluvialis fulva).* Individuals of this species spend the winter months in the Hawaiian Islands, usually returning to the same location every year, traveling to their arctic breeding grounds in April. Reported by the neighbor were the native owl or Pueo (*Asio flammeno sandwichensis*) and the endangered Nene (*Branta sandvicensis*), which finds the grasses of nearby Big Island Country Club golf course acceptable habitat. While the Nene was at one time both common and widespread, its numbers dwindled and at one point in the 20th century there were only 30 breeding pairs existing in the Islands. The population on the island of Hawai'i is presently estimated at several hundred, and one of the largest flocks is found at Pu'uwa'awa'a-Pu'uanahulu. Following the development of the golf course, with its fresh water and abundant new grass shoots, Nene have found it an attractive site, as they do other golf courses. Although Nene are seen in the area, the property as-is itself offers little in the way of unique habitat or resources that would be valuable to the Nene. Pueo are common in this part of the Big Island. Although not observed or reported, the Hawaiian Hawk or 'Io (*Buteo solitarius*), or Hawaiian Hawk, are listed as endangered by the U.S. Fish and Wildlife Service (USFWS) and the State of Hawai'i (USFWS 1992). Other endemic birds likely to be present at least occasionally as they wander down from the native forests at higher elevations are Common 'Amakihi (*Hemignathus virens virens*) and the 'Apapane (*Himatione sanguinea*).

Impacts and Mitigation Measures

In order to frame impacts to flora and fauna, it is important to remember that the project site is agriculturally-zoned land historically used for pasture and farming and is dominated by introduced plant species. If the subdivision is not created, alternative uses requiring no permit or approval include a horse or cattle pasture, a farm, or a piggery, among other farm uses. From this perspective, the subdivision will produce almost no impacts to any species of flora and fauna.

However, Nene may be more attracted to lawns around residences on the project site (as they are in other areas around the island) than they would be to pastures or piggeries. Nene browse on freshly mown grass and rapidly lose their natural fear of humans after constant exposure. Accordingly, occupation of residences has at least some potential to impact Nene at sometime in the future. Although this situation applies equally to residents of the far greater number of existing homes in Pu‘uanahulu and in many communities throughout the State (shoreline areas of Hilo, e.g.,) purchasers of the subdivision homes will be provided with material that informs them of the following facts about Nene:

- Mammalian predators, both pets and pests, pose a significant threat to Nene and their nests, eggs and goslings. Feral mammalian predators such as rats and mongooses should be controlled and residents should guard against injury of Nene by domestic dogs and cats, as reasonable.
- Harassment or injury of an endangered species is both a State and federal offense punishable with significant penalties. Nene should not be fed.
- Unintentional poisoning is a risk to Nene, and therefore it is advisable to utilize only insecticides, herbicides, pesticides and fungicides that are registered for use around endangered wildlife.

It should be noted that the potential threat posed by subdivision residents represents a miniscule portion of the threat posed by existing residences, golf courses, agricultural operations and road maintenance on the island. For measures such as those proposed above to be truly effective in the area, neighboring residences and farms would also ideally adopt them.

3.1.4 Air Quality, Noise, and Scenic Resources

Environmental Setting

Air pollution in West Hawai‘i is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that persistently blankets North and South Kona.

Noise on the project site is low to moderate and is derived principally from highway noise, as the project site lies along State Highway 190. Other permanent sources are residences and agricultural activities; construction in the area is a temporary source of noise. Moderate levels of noise mainly affect lots fronting the main road.

The Pu‘uanahulu area is highly scenic, but the project area does not contain any sites that are considered significant for their scenic character in the Hawai‘i County General Plan. Figure 3 illustrates the scenic value of the actual project site, which is modest.

Impacts and Mitigation Measures

The proposed action would not measurably affect air quality, noise levels, or scenic sites recognized in the Hawai‘i County General Plan.

Development of the driveway and power poles will involve excavation, grading, compressors, vehicle and equipment engine operation, and construction of new infrastructure. These activities have the potential to generate noise exceeding 95 decibels at times, impacting nearby sensitive noise receptors on the margins of the subdivision. Whenever construction noise is expected to exceed the Department of Health's (DOH) "maximum permissible" property-line noise levels, contractors will be required to consult with DOH per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH would then review the proposed activity, location, equipment, project purpose, and timetable in order to decide whether a permit is necessary and what conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers, will be necessary. The contractor would consult with DOH to determine whether permit restrictions would consist of construction being limited to daylight hours.

After this, subsequent noise-generating construction will consist of normal home-building, which is not expected to generate any substantial noise or to require a permit. Future legal uses of the properties for homes and gardens will also generate noise consistent with expectations and allowable limits in areas zoned Ag-1, which is thus not considered an impact.

3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions

Environmental Setting, Impacts and Mitigation Measures

According to the archaeological inventory report attached as Appendix 2, the site is not known to have been used for industry, modern intensive farming or as a dumping ground. This site history does not suggest the presence of hazardous materials in general or any problems associated with exposure to the public during development of the subdivision.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

The proposed action would most directly affect the mauka communities along State Highway 190 in North Kona, and in a wider sense, the entire North Kona District. Table 2 provides information on the socioeconomic characteristics of North Kona along with those of Hawai‘i County as a whole for comparison, from the United States 2000 Census of Population.

Impacts

Population increase as result of the additional five house lots is likely to be minor. Based on the North Kona District's average household size and vacancy rates, an increase of about 13 residents would occur. This would not lead to significant shifts in demographic characteristics, unemployment rates, or demands on public services. Importantly, the population increase is consistent with the expectations of Ag-1 zoning.

New housing increases the tax base for the County, and new residents often contribute to other government revenues including general excise and income taxes. The number of new lots and residents is unlikely to cause any substantial benefits from increases in such revenues.

Table 2. Selected Socioeconomic Characteristics

Characteristic	Hawai'i County	North Kona	Characteristic	Hawai'i County	North Kona
Total Population	148,677	28,543	21 to 65 Years, Disabled (%)	19.2	17.4
Median Age	38.6	39.4	Employed and Disabled, 21 to 65 Years, (%)	51.8	64.1
Older Than 65 Years (%)	13.5	11.8	65 Years of Older, Disabled (%)	40.3	38.1
Race (%)			Employment in:		
White	31.5	47.1	Management	30.2	26.6
Asian	26.7	16.3	Service	22.2	24.3
Hawaiian	9.7	8.9	Sales	25.1	27.8
Other Pacific Islander	1.5	1.8	Office	3.8	2.2
Two or More Races	28.4	23.5	Farming, Fishing and Forestry	9.9	10.4
Hispanic (Any Race)	9.5	7.9	Production, Transportation	8.9	8.8
Family Households (%)	69.6	68.6	Families Below Poverty Line (%)	11.0	5.6
Households with Female Householder, no Husband, With Children (%)	7.7	6.7	Households with Female Householder, no Husband, With Children, Below Poverty Line (%)	28.1	17.5
Householder Lives Alone (%)	23.1	20.1	Individuals Below Poverty Line (%)	15.7	9.7
Average Household Size	2.75	2.70	Over 65 Below Poverty Line	7.2	5.3
Average Family Size	3.24	3.13	Median Household Income ($)	39,805	47,610
Over 25 Years Old With High School Diploma (%)	84.6	87.7	Housing Owner-Occupied (%)	64.5	58.5
Married Now (%)	52.0	53.9	Housing Rented (%)	34.5	41.5
Widowed (%)	6.3	4.9	Housing Vacant (%)	15.5	19.7
Divorced Now (%)	10.7	11.4	Median Home Value, 1999 ($)	153,700	233,900
Veterans (%)	14.5	14.8	Median Rent, 1999 ($)	645	745
Over 16 in Labor Market (%)	61.7	69.2	Rent is Greater Than 25% of Income (%)	46.0	47.2
Residence 5 Years Ago (%)			Poverty by Race:		
Same Home	57.7	49.9	White	14.5	8.8
Different Home, Same County	26.5	28.8	Asian	7.3	6.2
Different County in Hawai`i	4.8	3.5	Native Hawaiian/Pacific Islander	26.4	15.8
Different State/Country	11.0	17.8	Two or More Races	20.4	10.3

Source: U.S. Bureau of the Census May 2001. *Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, Hawai'i.* (U.S. Census Bureau Web Page).

3.2.2 Cultural and Archaeological Resources

Cultural Resources

The project site is located in the ahupuaʻa of Puʻuanahulu, which along with the ahupuaʻa of Puʻuwaʻawaʻa is also known as Napuʻu, referring to the many hills. The first known habitation of the area involved temporary coastal sites as early as the tenth century. Permanent habitation of coastal areas began in the twelfth or thirteenth centuries, with agriculture expanding inland as the population of the island increased.

The lands of Kona north of Kailua are commonly referred to as Kekaha or Kekaha-wai-ʻole, waterless Kekaha. Although this land is notable for arid stretches of nearly bare lava, natives of the region knew where water could be found. Traditional settlement in Kekaha was primarily on the coast, where fishponds, shoreline resources and offshore fisheries provided sustenance. However, when studying the cultural setting in Hawaiʻi, it is important to focus on the ahupuaʻa. These land units generally extended from the mountain to the sea and contained most of the resources that a settlement would require for its subsistence, distributed at various elevations. As historian Marion Kelley has said, the ahupuaʻa "was the basic land unit, most common and most closely related to the religious and economic life of the people." (Kelley 1996:iv).

The property is near the border of the ahupuaʻa of Puʻuanahulu and Puʻu Waʻawaʻa, in the district or mokuʻaina of Kona. These two ahupuaʻa are often jointly referred to as Na Puʻu. Puʻuanahulu literally means ten-day hill, perhaps in reference to a supernatural dog and/or priestess of that name (Pukui et al 1974), or perhaps because of a ten-day ceremonial harvest period (Kumu Pono Assoc. 1999:20). Puʻu Waʻawaʻa means furrowed hill (Pukui et al 1974). Traditional accounts of the area also include personages with the names Anahulu and Waʻawaʻa (Kumu Pono Assoc. 1999:20).

JW.H.I. Kihe, a resident of Kekaha a century ago, is cited in Kumu Pono Associates (1999:20-22) for a series of stories about Puʻu Anahulu illustrating the relationship of natural and spiritual forces in sustaining rainfall, pond water and the food resources that these in turn provided. There are many wahi pana (or storied places) in Puʻu Anahulu. Kumu Pono Associates (1999:31-32) cite a number of hills, caves, water channels, water holes and ridges in the area. Although none are present on the project site itself, many are visible from there and imbue the property with a rich sense of history and connectedness with its ahupuaʻa.

Traditional Hawaiian land use was arranged according to elevational zones called "wao" in Hawaiian (Pukui et al 1999). Regarding the subject area:

> "These environmental zones include the near-shore fisheries and shoreline strand (kahakai) and the kula kai-kula uka (shoreward and inland plains). These areas were greatly desired as places of residence by the natives of the land. (Kumu Pono Assoc. 2001 n.p.)"

Although only a few remnant diverse native dry forests survive today, the kula region formerly harbored plant communities of great diversity and utility to the inhabitants. In the wao kanaka (region of man, about 1,800-2,400 feet in elevation, where the project site is located) and wao nahele (forest region, 2,400-4,000 feet), greater rainfall induced denser forest growth. The area embracing the current Puʻuanahulu Homesteads and Puʻu Waʻawaʻa Ranch was known as Napuʻu-puʻalu-kinikini (the-many-folded or gullied-hills). Further mauka are the heavily forested wao maʻukele and the wao akua, or "region of gods." All these elevational zones were important and integrated. In the words of Kumu Pono Associates (2001:n.p.):

> "Early native residents of Napuʻu and their descendants share a deep cultural attachment with their environment. Their customs, beliefs, practices, and history are place based. This attachment to place is rooted in the native belief that all things within the environment are interrelated. Whether in the uplands, the near shore lowlands, or in the sea, everything was connected. The ahupuaʻa as the primary native land unit was the thread which bound all things together in Hawaiian life."

This attachment to and honoring of place in Napuʻu continues today, as *Hui ʻOhana mai Puʻu Anahulu a me Puʻu Waʻawaʻa*, a community-based organization composed of Hawaiian families, descendants of the native tenants and historic homesteaders, has undertaken a program of oral history interviews and documentary research.

In the late 16th century, the Kona District, which included Puʻuanahulu, was controlled by High Chief Ehunuikaimalino. Control later passed to ʻUmi, a direct descendant of Liloa, former king of Hawaiʻi. Kalaniopuʻu became ruler of Puʻuanahulu in the late 1600s (Malo 1840). After his death, his son, Kiwalo, became ruler until the land was conquered by Kamehameha, whose direct descendants maintained control until well into the 1800s.

Although Napuʻu once had plentiful resources, from the mid-1700s the economies of the ahupuaʻa of North Kona were unable to produce sufficient crops for trade. The introduction of goats and cattle in 1793 by Capt. George Vancouver, with Kamehameha's approval, encouraged the growth of population in inland areas. By 1860, ranching began to dominate the land, providing revenues from the export of salted beef and hides. The influx of cattle, much of which became feral, decimated the lands and polluted fresh water sources (Sato et al. 1971), prompting the construction of paʻaina or walls to protect agriculture areas. The grazing animals contributed to the deforestation of the area by eating and trampling new shoots and the undergrowth that protected the roots and trunks of trees (Maxwell in Thrum 1900).

In the years following the passage in 1850 of the Kuleana Act, the 20,000 acres of Puʻuanahulu became government lands. With the exception of native tenants who were allowed to utilize kuleana land for their sustenance, all of Puʻuanahulu was leased to three residents of Honolulu: G. Kaukuna, M Maeha and S. Kanakaole. Two years later the leases were sold to Francis Spencer to be added to the holdings of the Waimea Grazing and Agricultural Company. After Spencer's lease expired in 1895, 38 residents of Napuʻu submitted petitions for homesteads

under the 1884 Homestead Act and the Land Act of 1895. In 1897, the government laid out 40 homestead parcels in Puʻuanahulu. Because it was the intent of the Homestead Act to provide residents with land upon which they could cultivate crops or graze animals, most of the lots were provided near the mauka road that ran through North Kona (Kumu Pono Assoc. 1999:139).

In 1917, Senator Robert Hind began combining lands in Puʻuanahulu and Puʻuwaʻawaʻa to create Puʻulani Ranch. Hind died in 1938, leaving his ranch under trustee John K. Clarke. The Hind family remained at Puʻu Waʻawaʻa until 1958. In 1958, Puʻuwaʻawaʻa Ranch was sold to Dillingham Ranch, Inc. in joint tenure with F.N. Bohnett, who eventually acquired ownership of Puʻuanahulu Homesteads. In 1986, Bohnett began developing Puʻulani Estates, an upscale subdivision adjacent to the project site. The 1990s also saw the development of Big Island Country Club nearby.

The actual project site became the homestead of the Makaʻai family, who lived on the property during the late 19th to mid-20th century.

As discussed above, the storied landscape of Napuʻu is cherished as an embodiment of a vibrant, ongoing Hawaiian culture. Valued natural, cultural and historical resources are present in many locations. In particular, puʻu (hills) have a symbolic importance that exceeds even the value of their scenic beauty. On a wider level, the entire range of wao that make up the ahupuaʻa, from the kahakai (shoreline) to the wao akua (cloud forests), have a level of cultural importance.

Although the action involves only provision of access and electrical connection to an existing residential ranch lot proposed for subdivision into 6 lots, the Office of Hawaiian Affairs (Honolulu and West Hawaiʻi), the Kona Hawaiian Civic Club, the Puʻuanahulu Community Association, the Puʻuanahulu Baptist Church, and a number of direct neighbors, several with multi-generation family ties to the area, were contacted to determine if they had any knowledge of cultural resources that may be present or practices that may be ongoing on the property. No specific resources or practices were identified, which was expected given the particular property. Aside from the burial site that is not being affected and in fact is being protected (see discussion below), no cultural sites are known to exist, and no impacts to any sites are expected. This finding will be reviewed after comments on the Draft EA.

Archaeological Resources

An archaeological inventory survey for the entire project site was prepared by Archaeological Consultants of the Pacific, Inc. The final revision of the survey, along with State Historic Preservation Division (SHPD) correspondence, is contained in Appendix 2 and is summarized below.

The inventory survey determined that no sites were already listed on the National and State Register of Historic Places on the project site. Fieldwork and documentary research identified only one historic site on the property, a known historic-era cemetery. This burial complex is

entirely located within the part of the property that already contains a residence and that is not expected to undergo any changes as a result of the subdivision. The cemetery associated with the Makaʻai family is comprised of 11 individual features including 10 interpreted as burial markers. Interviews with lineal descendants in the area date the burials to the late 1800s through the 1940s. The burial ground may also have been used prior to Western Contact, in which case there may also be unmarked burials in the vicinity. According to the interviews, the Makaʻai family descended from two brothers, Makaʻaialiʻi and Makaʻainui. The most recent burial was that of Joseph Makaʻai in the 1940s. The other individuals in the burial site are unknown but are believed to include parents, aunts, uncles and siblings of Joseph Makaʻai. Archaeological Consultants of the Pacific determined that the burial complex was significant and recommended preservation in place. The State Historic Preservation Division concurred with this recommendation in a letter of April 11, 2007 (see Appendix 2).

A treatment plan that preserves the entire burial site was prepared and has been submitted to the Hawaiʻi Island Burial Council for review. The plan calls for preservation of the graveyard in two forms: interim protection measures during the operation of heavy equipment, which include establishment of a temporary buffer zone and an on-site preconstruction briefing by a qualified archaeologist, and long-term measures to include the establishment, landscaping and maintenance of a permanent buffer zone. No archaeological sites are present in the parts of the property where new lots and residences will be created. The burial site and its buffers are all enclosed in the lot being set aside for the existing residence.

In the unlikely event that additional archaeological resources are encountered during future development activities, work in the immediate area of the discovery will be halted and DLNR-SHPD contacted as outlined in Hawaiʻi Administrative Rules 13§13-275-12.

3.3 Infrastructure

3.3.1 Utilities

Existing Facilities and Services, Impacts and Mitigation Measures

Electrical power would be supplied to the project area by Hawaiʻi Electric Light Company (HELCO), a privately owned utility company regulated by the State Public Utilities Commission, via its island-wide distribution network. Telephone service is available from Hawaiian Telcom. Three lots would be provided with electrical and telephone service from existing poles and lines located in the right-of-way of State Highway 190, and two from poles and lines and at the back of the property (the existing home already has service from the back of the property). Water would be provided via the Napuʻu Water Inc., a private water company, from water lines that have already been installed for the project under an agreement with the water company. The proposed action would not have any adverse impact on existing utilities.

3.3.2 Roadways

Existing Facilities

State Highway 190 is a primary arterial highway that has two lanes in this area. The applicant has obtained Department of Transportation approval for the two driveways to provide access to the project. The highway curves in this area and there are existing sight distance deficiencies.

Impacts and Mitigation Measures

The 6-lot subdivision will increase traffic very slightly along State Highway 190, well within the capacity of this facility to absorb such traffic. The applicant has worked with the Department of Transportation to identify appropriate driveway sites and has committed to minor grading and vegetation removal within the highway right-of-way and adjacent land to improve sight distance to acceptable levels in order to minimize highway ingress and egress safety concerns (see Figure 6 for locations).

3.4 Secondary and Cumulative Impacts

The proposed action involves a six-lot subdivision, a relatively small number of lots compared to the adjoining Big Island Country Club and Pu‘u Lani Ranch subdivisions. The magnitude of this action is not one to lead to substantial secondary effects such as large population changes or stress 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. Aside from the gradual development of the upscale Pu‘u Lani Ranch, located north of the project site, the only substantial development proposed in the area involves expansion of the Big Island Country Club, either to a 27-hole golf course with adjacent residences as originally planned or as a 106-unit rural residential project as proposed in 2005 in a petition to the Hawai‘i State Land Use Commission. This development has been delayed and may not be implemented for some time, if at all.

Regardless, any future development at Big Island Country Club would modestly increase population and traffic and would contribute to the transformation of Pu‘uanahulu from a traditional Hawaiian ranching community to mixture of this and medium to high-end residential lots. Actions such as the proposed 6-lot subdivision are basically in keeping with the small-lot agricultural tradition. The population and traffic increases, as discussed above, are modest and would not strain local infrastructure even considering future development. No substantial cumulative adverse effect is anticipated.

3.5 Required Permits and Approvals

The following permits and approvals would be required:

- County of Hawai‘i, Department of Public Works, Engineering Division, Grading Permit
- County of Hawai‘i, Planning Department, Final Subdivision Approval
- Approval for Work Within State Highway Right-of-Way

3.6 Consistency With Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State's long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The proposed project would promote these goals by adding housing opportunities for the North Kona district, thereby enhancing quality-of-life and community and social well-being.

3.6.2 Hawai‘i County SMA, Zoning and General Plan

Special Management Area. The property is not situated within the County's Special Management Area (SMA).

Hawai‘i County Zoning. The project site is zoned A-1, (agricultural, minimum lot size 1 acre). The proposed action is entirely consistent with this designation.

The *Hawai‘i County General Plan Land Use Pattern Allocation Guide (LUPAG)*. The LUPAG map component of the *General Plan* is a graphic representation of the Plan's goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The project site is classified as Rural in the LUPAG. The proposed action is consistent with this designation.

The *General Plan* for the County of Hawai‘i is a policy 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 (Hawai‘i County Department of Planning). The *General Plan* itself 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. Most relevant to the proposed action are the following Goal and Policies, and Courses of Action of particular chapters of the General Plan:

ECONOMIC GOALS

Provide residents with opportunities to improve their quality of life through economic development that enhances the County's natural and social environments.

Economic development and improvement shall be in balance with the physical, social, and cultural environments of the island of Hawaii.

Strive for diversity and stability in the economic system.

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 action is in balance with the natural, cultural and social environment of the County, and it will create temporary construction jobs for local residents and indirectly affect 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

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.

Maintain and, if feasible, improve the existing environmental quality of the island.

ENVIRONMENTAL QUALITY POLICIES

Take positive action to further maintain the quality of the environment.

ENVIRONMENTAL QUALITY STANDARDS

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.

Incorporate environmental quality controls either as standards in appropriate ordinances or as conditions of approval.

Discussion: The proposed action, which occurs in an area designated for 1-acre agricultural lots that has been farmed or grazed throughout history, would not have a substantial adverse effect on the environment and would not diminish the valuable natural resources of the region. The project will obtain permits and follow the conditions designed to reduce or eliminate pollution and environmental degradation.

HISTORIC SITES GOALS

Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawaii.

Appropriate access to significant historic sites, buildings**,** and objects of public interest should be made available.

HISTORIC SITES POLICIES

Agencies and organizations, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.

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.

Public access to significant historic sites and objects shall be acquired, where appropriate.

Discussion: Archaeological resources are being protected through inventory survey, as well as the formulation and implementation of a burial treatment plan, all of which have been or are being reviewed by the State Historic Preservation Division.

FLOOD CONTROL AND DRAINAGE GOALS

Conserve scenic and natural resources.

Protect human life.

Prevent damage to man-made improvements.

Control pollution.

Prevent damage from inundation.

Reduce surface water and sediment runoff

FLOOD CONTROL AND DRAINAGE POLICIES

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.

Development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works in compliance with all State and Federal laws.

FLOOD CONTROL AND DRAINAGE STANDARDS

Applicable standards and regulations of Chapter 27, "Flood Control," of the Hawaii County Code.

Applicable standards and regulations of the Federal Emergency Management Agency (FEMA).

Applicable standards and regulations of Chapter 10, "Erosion and Sedimentation Control" of the Hawaii County Code.

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 the 100-year floodplain, according to the Flood Insurance Rate Maps (FIRM). The improvements are subject to review by the Hawai‘i County Department of Public Works to ensure that all relevant standards of Chapter 27 and Chapter 10 are addressed.

NATURAL BEAUTY GOALS

Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.

Protect scenic vistas and view planes from becoming obstructed.

Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

NATURAL BEAUTY POLICIES

Increase public pedestrian access opportunities to scenic places and vistas.

Protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.

Do not allow incompatible construction in areas of natural beauty.

Discussion: The construction of the subdivision occurred in an area with similar residential/agricultural uses. No adverse visual impacts are expected.

NATURAL RESOURCES AND SHORELINES GOALS

Protect and conserve the natural resources of the County of Hawaii from undue exploitation, encroachment and damage.

Provide opportunities for the public to fulfill recreational, economic, and educational needs without despoiling or endangering natural resources.

Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.

Ensure that alterations to existing landforms and vegetation, except crops, 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 earthquake.

NATURAL RESOURCES AND SHORELINES POLICIES

The County of Hawaii should require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.

Encourage the use of native plants for screening and landscaping.

Discussion: The proposed action is not located on the shoreline. Impacts to existing natural landforms and vegetation will be mitigated through permit-regulated Best Management Practices to avoid any impacts related to flooding, landslides, sedimentation or other similar impacts.

LAND USE GOALS

Designate and allocate land uses in appropriate proportions and mix and in keeping with the social, cultural, and physical environments of the County.

LAND USE POLICIES

Allocate appropriate requested zoning in accordance with the existing or projected needs of neighborhood, community, region and County.

LAND USE, OPEN SPACE GOALS

Provide and protect open space for the social, environmental, and economic well-being of the County of Hawaii and its residents.

Protect designated natural areas.

LAND USE, OPEN SPACE POLICIES

Open space shall reflect and be in keeping with the goals, policies, and standards set forth in the other elements of the General Plan.

Discussion: The Ag-1 subdivision is in keeping with County and State land use plans and does not detract from important open space.

3.6.3 Hawai‘i State Land Use Law

All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The property is in the State Land Use Agricultural District. The proposed use is consistent with intended uses for this land use district.

PART 4: DETERMINATION

Based on the findings below, and in consideration of comments on the Draft EA, the Hawai‘i County Planning Department has determined that the proposed project will not significantly alter the environment. This agency therefore determined that an Environmental Impact Statement is not warranted and has issued a Finding of No Significant Impact (FONSI).

PART 5: FINDINGS AND REASONS

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

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 resources would be committed or lost. The project site and surrounding areas support residential and agricultural uses and will not be affected by the proposed action. In any case, these resources were properly inventoried and the one significant resource, a burial complex, will be responsibly protected.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project does not curtail, and in fact enhances, the range of beneficial uses of the environment by providing additional opportunities for residential and agricultural uses of the project site, consistent with similar uses within the immediate area and historical use of property.
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 proposed action provides housing in an appropriate area for residents of Hawai‘i County, fulfilling needed County and State goals while avoiding significant impacts to the environment. 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 major effects are beneficial, providing housing and jobs. Although considering the cumulative deficiency of infrastructure, and that any population increase in Kona involves potentially adverse effects to traffic, the location of the subdivision far from the district’s population centers and actions being undertaken to improve sight distance will minimize the effects of traffic on that roadway system from the additional 6 lots.
5. *The proposed project does not substantially affect public health in any detrimental way.* No effects to public health are anticipated.
6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. No adverse secondary effects are expected to result from the 6-lot subdivision, which is not large enough to directly or indirectly tax public infrastructure or facilities.
7. *The proposed project will not involve a substantial degradation of environmental quality*. The proposed action is minor and is being regulated by permits to avoid environmental degradation, and thus 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.* The project site supports overwhelmingly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna will not occur. Residents will be informed about ways to minimize any impacts on Nene, an endangered species that is expanding its range in the area.
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 6-lot subdivision is not related to other activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.
10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* Due to the character and density of the proposed action, no adverse effects on these resources would occur.
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.* Although the proposed action is located in an area with volcanic and seismic risk, the entire Island of Hawai‘i shares this risk, and the proposed action is not imprudent to construct. No floodplains are involved.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* The project site is not noted for its natural beauty in the Hawai‘i County General Plan, and no aspect of the proposed action would adversely impact scenic resources or viewplanes.
13. *The project will not require substantial energy consumption*. Although subdivision infrastructure construction will require the use of energy, as will home construction, no major adverse effects to energy consumption would be expected, and there is no feasible way to provide housing without energy consumption.

REFERENCES

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

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

Heliker, C. 1990. *Volcanic and Seismic Hazards on the Island of Hawai'i.* Washington: U.S. GPO.

Kelley, M. 1996. *A Brief History of the Ahupua'a of Pu'uwa'awa'a and Its Neighbors in North Kona, Island of Hawai`i*. Privately printed by Earl Bakken.

Kumu Pono Associates. 1999 (v.1) and 2000 (v.2). *Pu'u Anahulu And Pu'u Wa'awa'a, (Nāpu'u), At Kekaha - Kona, Hawai'i, A Report On Archival-Historical Documentary Research, And Oral History Interviews. Cultural-Historical Documentation for Ahupua'a Based Planning in the Lands of Pu'u Anahulu and Pu'u Wa'awa'a (Nāpu'u; District of Kona, Island of Hawai'i*. Kumu Pono Associates. Hilo.

_____. 2001. *He Wahi Mo'olelo no na 'Aina o Pu'u Anahulu Me Pu'u Wa'awa'a a me na 'Ohana Papa o ka 'Aina Alohao Napu'u ma Kona* (brochure). Honolulu: Kumu Pono Associates/Nature Conservancy.

Malo, D. 1951. *Hawaiian Antiquities: Mo'olelo Hawai'i*. Bernice P. Bishop Museum, Special Publication 2, Second Edition. Bishop Museum Press: Honolulu, Hawai'i.

Pukui, M.K. and E.S.C. Handy. 1999. *The Polynesian Family System in Ka`u, Hawai'i*. Mutual Publishing. Orig. Ed. 1972.

Sato, Ikeda, Paeth, Smythe & Takehiro, Jr. 1971. *Soil Survey of the Island of Hawai'i. U.S. Department of Agriculture*. Soil Conservation Service and University of Hawai'i Agricultural Experiment Station. Washington, D.C., GPO.

Thrum, T.G. 1900. Excerpt from *Hawaiian Annual*. Honolulu, Hawai'i.

U.S. Dept. of Commerce, Bureau of the Census. 2001. http://factfinder.census.gov/ .

U.S. Soil Conservation Service. 1973. *Soil Survey of Island of Hawai'i, State of Hawai'i.* Washington: U.S.D.A. Soil Conservation Service.

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

U.S. Fish and Wildlife Service (USFWS). 2007. *USFWS Threatened and Endangered Species System (TESS).* Washington: GPO. http://ecos.fws.gov/tess_public/StartTESS.do

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

ENVIRONMENTAL ASSESSMENT

Pu‘u Nana Estates Subdivision

APPENDIX 1a

COMMENTS IN RESPONSE TO EARLY CONSULTATION

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
ACTING DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HAWAII DISTRICT
50 MAKAALA STREET
HILO, HAWAII 96720
TELEPHONE (808) 933-8866 • FAX: (808) 933-8869

IN REPLY REFER TO:
HWY-H 07-2.1118

December 6, 2007

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

Dear Mr. Terry:

SUBJECT: Early Consultation on Environmental Assessment for Use of State Land in Association with HELCO Electrical Power Connection for 6-Lot Subdivision (Rodney Imming)
T.M.K. 3rd Div. 7-1-005:004
Federal Aid Project No. 10-A
Route 190, Mamalahoa Highway
Puuanahulu, North Kona, Island of Hawai'i, Hawai'i

The subject property is adjacent to the state highway route 190 Mamalahoa Highway. According to our records we had previously sent our comments on the subdivision action to the County of Hawaii Planning Department on February 5, 2005 and on April 19, 2006 for this property. We do not know the current status of the subdivision application and will await a copy of the tentative approval response from the County before making any additional comments. The development will require an improved driveway to accommodate the anticipated design traffic. Please include a discussion on this issue in the environmental assessment.

Please send copies of the Environmental Assessment to our Department for review and comment.

Our Department will then further distribute the copies to the appropriate divisions and branches at which time we will review and provide comments. After all comments are received and coordinated, a response from the director will be sent to the County Department approving agency.

Please note that at this time we will not be able to provide comments without pre-empting the departmental response.

If you have any questions please call Mr. Clinton Yamada at 933-1951.

Very truly yours,

STANLEY M. TAMURA
Hawai'i District Engineer

Harry Kim
Mayor

Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2389

December 12, 2007

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

Dear Mr. Terry:

SUBJECT: Early Consultation on Environmental Assessment for Use of State Land in Association with HELCO Electrical Power Connection for 6-Lot Subdivision in Pu'uanahulu, North Kona, Island of Hawaii, TMK: 7-1-005:004

This is in response to your letter dated December 1, 2007, soliciting any comments in reference to the above-referenced project.

Staff has reviewed the Environmental Assessment and has no comments or objections to offer at this time.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF

DEREK D. PACHECO
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

RA:dmv

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKUANAO'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

December 20, 2007

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

PRE-ENVIRONMENTAL ASSESSMENT CONSULTATION
TAX MAP KEY 7-1-005:004

This is in response to your Pre-Environmental Assessment consultation letter dated December 1, 2007.

Please be informed that the existing water system in the area is privately owned and operated, and beyond the jurisdiction of the Department of Water Supply.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Sincerely yours,

Milton D. Pavao, P.E.
Manager

FM:dfg

... Water brings progress...

The Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410. Or call (202) 720-5964 (voice and TDD)

Dec. 28, 2007

Aloha, Mr. Terry:

I left a message on your phone today re your letter of Dec. 1, 2007, about the property owned by Rod Imming in Pu'uanahulu, requesting our input on site conditions or other concerns. Thank you for the opportunity.

One of my concerns involves the native and non-native birds that frequent the property. We have a number of Nene that fly over early every morning and again every evening on their way to and from the Big Island Country Club. There are also two pueos, or owls, that frequent the area; whether they live here or just hunt here I'm not certain, but we see them quite often. A flock of native birds called coleeges (sp?) or red-eyed chickens, are on the property every day, and the area is full of Erkels (Franklins) and wild turkeys, as well as a few quail. There are also one or two seasonal plovers that return each year to feed.

There are some very old grave sites in a cemetery that abuts Mr. Imming's property and a church next to it as well that also has grave sites in its yard, but I'm uncertain if any burial plots cross over into his area.

I doubt that there will be much traffic impact since it is my understanding that the speed limit in this area is soon to be reduced to 35 mph (happy day!) and the two driveways to be added will have a clear line of sight.

Naturally, we are a bit apprehensive as to how six additional homes will impact our quality of life, what with the accompanying increase in noise levels from people, dogs, and cars; however, we also realize that nothing stays the same and change is inevitable.

Again, I thank you for the opportunity to offer input regarding this project. And yes, I would appreciate a copy of the EA when it is completed.

Sincerely,

M. Humble

Marnie Humble

ENVIRONMENTAL ASSESSMENT

Pu‘u Nana Estates Subdivision

APPENDIX 1b

COMMENTS TO DRAFT E.A. AND RESPONSES

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

July 2, 2008

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

DRAFT ENVIRONMENTAL ASSESSMENT
PUU NANA ESTATES
TAX MAP KEY 7-1-005:004

We have reviewed the subject Draft Environmental Assessment and have no comments or objections as the water system in the area is privately owned and operated.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Sincerely yours,

Milton D. Pavao, P.E.
Manager

FM:dfg

copy – Office of Environmental Quality Control
Planning Department

The Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410. Or call (202) 720-5964 (voice and TDD)

geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 fax: (866) 316-6988 PO Box 396 Hilo Hawaii 96721
rterry@hawaii.rr.com

July 25, 2008

Milton Pavao, Manager
Hawai‘i County DWS
345 Kekuanaoa Street, Suite 20
Hilo HI 96720

Dear Mr. Pavao:

Subject: Comment to Draft Environmental Assessment for Pu‘u Nana Estates Subdivision, Pu‘uanahulu, North Kona, Island of Hawai‘i, TMK 7-1-005:004

Thank you for your comment letter on the Draft EA dated July 2, 2008, in which you stated that the water system in the area is privately owned and operated and your Department had no comments or objections.

We 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: Christopher J. Yuen, Director, Hawai‘i County Planning Department

ENVIRONMENTAL ASSESSMENT

Pu‘u Nana Estates Subdivision

APPENDIX 2

ARCHAEOLOGICAL INVENTORY SURVEY AND RELATED CORRESPONDENCE

LAURA H. THIELEN
CHAIRPERSON OF THE BOARD

DEPUTY TO CHAIRPERSON
KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER
ROBERT K. MASUDA
DEPUTY DIRECTOR - FORESTRY AND WILDLIFE
GUY H. KAULAHAO
DEPUTY DIRECTOR - CONSERVATION AND RESOURCES ENFORCEMENT
ALAN M. TAKEMOTO
DEPUTY DIRECTOR - STATE PARKS
DEPUTY DIRECTOR - LAND

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

April 11, 2007

Mr. Joseph Kennedy
Archaeological Consultants of the Pacific, Inc.
59-624 Pupukea road
Haleiwa, Hawaii 96712

LOG NO: 2007.1080
DOC NO: 0704MK12
Archaeology

Dear Mr. Kennedy:

SUBJECT: **Chapter 6E-42 Historic Preservation Review –**
Archaeological Inventory Survey Report for a
Property Located in Pua Nana Estates
Puaanahulu Ahupuaa, North Kona District, Island of Hawaii
TMK (3) 7-1-005:004

Thank you for the opportunity to provide comments on this revised report received by our office on October 20, 2007 (Gregg *et al.* 2006, *An Archaeological Inventory Survey for a Property Located at TMK: (3) 7-1-05:04 In Pua Nana Estates Subdivision, In Puaanahulu ahupuaa North Kona District, Island of Hawaii)*...Archaeological Consultants of the Pacific, Inc. We have previously provided comments on an earlier draft version of the report (LOG NO: 2006.3278/ DOC NO: 0610JT19) and recommended minor revisions.

We indicated semantic change to the language regarding evaluating significance and recommendations to accurately reflect the historic preservation review process at the State level. We also recommended additional consultation with knowledgeable individuals regarding the family cemetery located on the subject property. Both of these requested revisions have been resolved acceptably.

SIHP 50-10-20-24739 consists of a burial complex composed of ten rectangular alignments and one terrace. Based on the number of features it is suggested that a minimum of 11 individuals are interred at the site.

The site is significant under both Criteria "D" and "E", for information content and traditional cultural significance. We concur with this assessment.

We also agree that the family cemetery will be preserved in perpetuity and will await the submittal of a Burial Treatment/Preservation Plan detailing the specifics. The plan will be submitted to our office for review and comment by the Hawaii Island Burial Council and SHPD Culture and History Program.

c: Chris Yuen, Director Planning, County of Hawaii, FAX 961-8742 (Hilo) and 327-3563 (Fax)
Bruce McClure, Dept. of Public Works, County of Hawaii FAX 961-8321
Keola Lindsey, Cultural Specialist, SHPD
Rodd Imming, FAX 808 331-1987

We also concur that should development be proposed on the subject parcel, including but not limited to grubbing, grading, farm or residential construction, archaeological monitoring is the appropriate mitigation. We will await submittal of an archaeological monitoring plan prior to any proposed ground altering activities.

We find this report to be acceptable. As always, if you disagree with our comments or have questions, please contact Dr. Melissa Kirkendall at (808) 243-5169 as soon as possible to resolve these concerns.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

MK:kf

c: Chris Yuen, Director Planning, County of Hawaii, FAX 961-8742 (Hilo) and 327-3563 (Fax)
Bruce McClure, Dept. of Public Works, County of Hawaii FAX 961-8321
Keola Lindsey, Cultural Specialist, SHPD
Rodd Imming, FAX 808 331-1987

AN ARCHAEOLOGICAL INVENTORY SURVEY REPORT FOR A PROPERTY LOCATED AT TMK: 7-1-05: 04 IN PU'U NANA ESTATES SUBDIVISION, IN PU'UANAHULU AHUPUA'A, NORTH KONA DISTRICT, ISLAND OF HAWAII REVISED DECEMBER 2006

Prepared for: Mr. Rod Imming
75-346 Hualalai Road # B105
Kailua-Kona, Hawaii 96740

Prepared by: Archaeological Consultants of the Pacific, Inc.
Elizabeth Gregg, B.A.
Mina Elison, B.A.
Joseph Kennedy, M.A.
59-624 Pupukea Road
Haleiwa, Hawaii 96712

JOSEPH KENNEDY
Archaeologist

Inventory Reports • Data Recovery Reports • Research Design Documents • Monitoring • Due Diligence Work • Historical Studies • Cultural Studies • Burial Treatment Plans • Preservation Plans • Interpretive Reconstructions • Restorations • Qualified Expert Witness Testimony

59-624 Pupukea Road Haleiwa, Hawaii 96712 Phone: 638-7442/Fax: 638-0703
e-mail: archaeologypacific@hawaii.rr.com

Abstract

An Archaeological Inventory Survey has been conducted on property located at TMK: 7-1-05: 04 at Pu'u Nana Estates Subdivision, in Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i. The purpose of the current investigations was to determine if significant historic properties exist within the project limits and, if present, properly document and evaluate those sites.

The current investigations took the form of a 100% pedestrian surface survey of the subject property. One site of significance to the interests of historic preservation (Site 50-10-20-24739)(please note that in the remainder of this document only the 5 digit individual site numbers will be cited) was identified during the surface survey. Site 24739 consists of a burial complex composed of ten rectangular alignments and one terrace. Features A and B exhibit depressions which are often interpreted as a sign of coffin collapse indicating post-Contact interment. Testimony from recognized Pu'uanahulu descendants concluded that the burials belong to the Maka'ai family who lived on the current subject property during the Homestead Period. Based on the number of features present and the larger size of Feature B it is likely that a minimum of 11 individuals are interred at Site 24739.

Based upon the results of the current investigations, Archaeological Consultants of the Pacific, Inc. recommends that a determination be made that future construction activities would have an "effect" on significant historic properties. Because of the presence of human burials at Site 24739, it is also recommended that Site 24739 be preserved "as is" and that on site archaeological monitoring take place during any future subsurface construction activities conducted in the vicinity of the site the details of which will be presented in a separate Burial Treatment Plan as well as an Archaeological Monitoring Plan.

Table of Contents

Abstract i

Section 1: Introduction 1

Figure 1: Project Location on a Map of Hawai'i 2

Section 2: Physical Setting 3

Figure 2: Location of the Subject Property on a U.S.G.S. Topographic Map 4

Figure 3: Location of the Subject Property on a TMK Map 5

Section 3: Historic Background 6

Section 3.1: Legends and Traditional Accounts 6

Section 3.2: Land Use History 7

Section 3.3: The Mahele of 1848 8

Table 1: Pu'uanahulu Leases 9

Section 3.4: Past Archaeological Survey 11

Section 3.5: Settlement Patterns 13

Section 3.6: Expected Finds 14

Section 4: Archaeological Methods 15

Section 5: Archaeological Findings 17

Section 5.1: Site Description 17

Table 2: Site and Feature Summary 17

Figure 4: Location of Site 24739 on a Map of the Subject Property 18

Figure 5: Top Plan of Site 24739 19

Section 5.2: Discussion of Archaeological Findings 21

Section 6: Evaluation of Site Significance 22

Table 3: Summary of Site Significance Evaluations 22

Conclusion 23

References Cited 24

An Archaeological Inventory Survey Report for a Property Located at TMK: 7-1-05: 04 in Pu'u Nana Estates Subdivision, in Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i

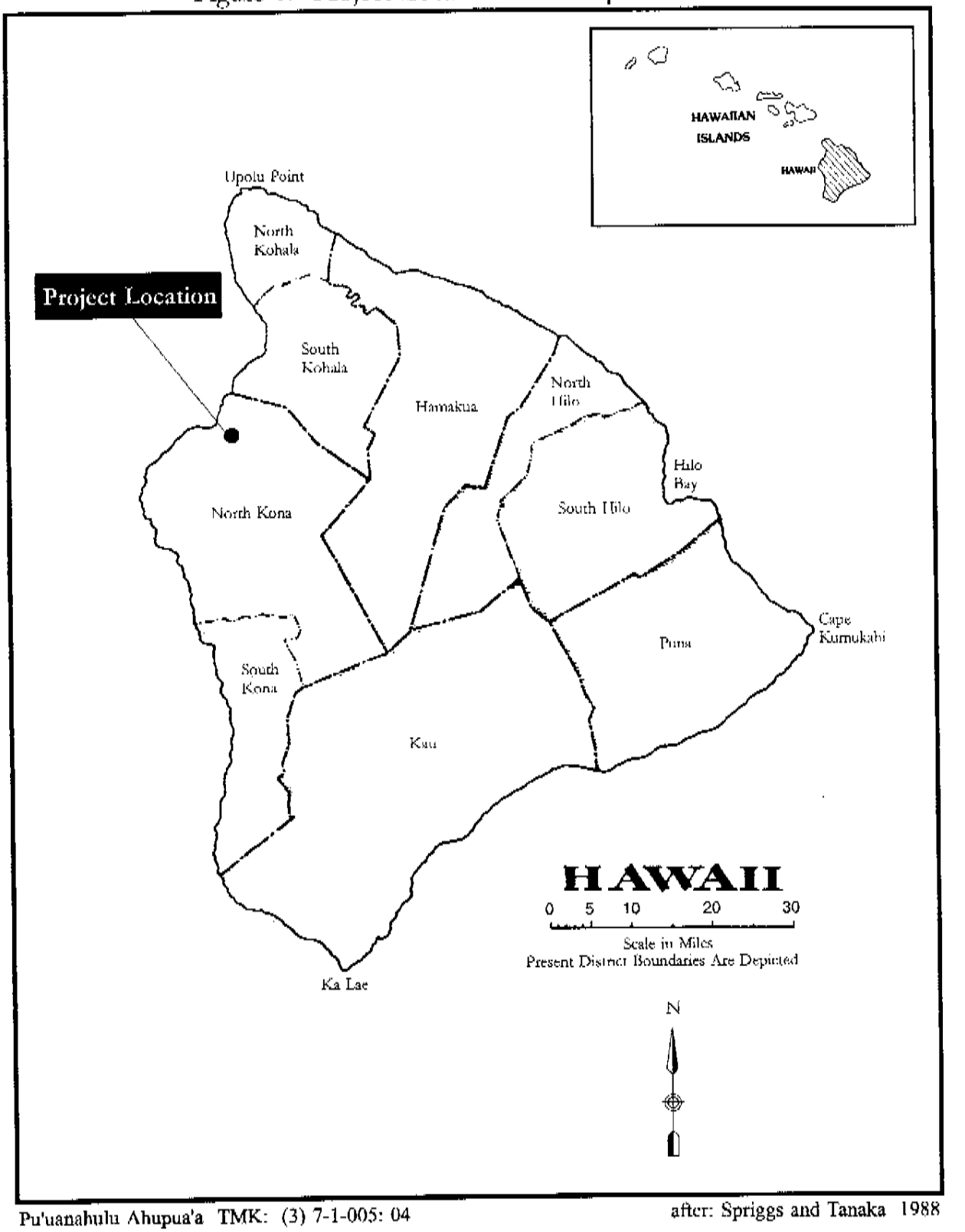
Section 1: Introduction

At the request of the landowner Mr. Rod Imming, Archaeological Consultants of the Pacific, Inc. (ACP) has conducted an archaeological inventory survey of a 6.816 acre parcel located at TMK: 7-1-05: 04 in Pu'u Nana Estates Subdivision, Pu'uanahulu Ahupua'a, North Kona District, Island of Hawai'i (see Figure 1).

The purpose of these archaeological investigations was to perform the tasks and meet the requirements specified by the State of Hawai'i, Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD). These investigations would allow for the identification of potential historic resources located on the property as well as an evaluation of their significance. These investigations also allow for the making of recommendations concerning the mitigation of the impact of future construction activities upon potentially significant historic resources.

The following report presents a background of the region which includes reviews of the previous archaeology conducted in the area, previous land uses and settlement patterns. Following these sections, detailed descriptions of the archaeological features inventoried during the investigation are provided. The descriptions include discussions concerning functional aspects of the features as well as their estimated ages. The significance of each site identified is evaluated and recommendations are made concerning the treatment of significant historic properties.

Figure 1: Project Location on a Map of Hawai'i



Pu'uanahulu Ahupua'a TMK: (3) 7-1-005: 04 after: Spriggs and Tanaka 1988

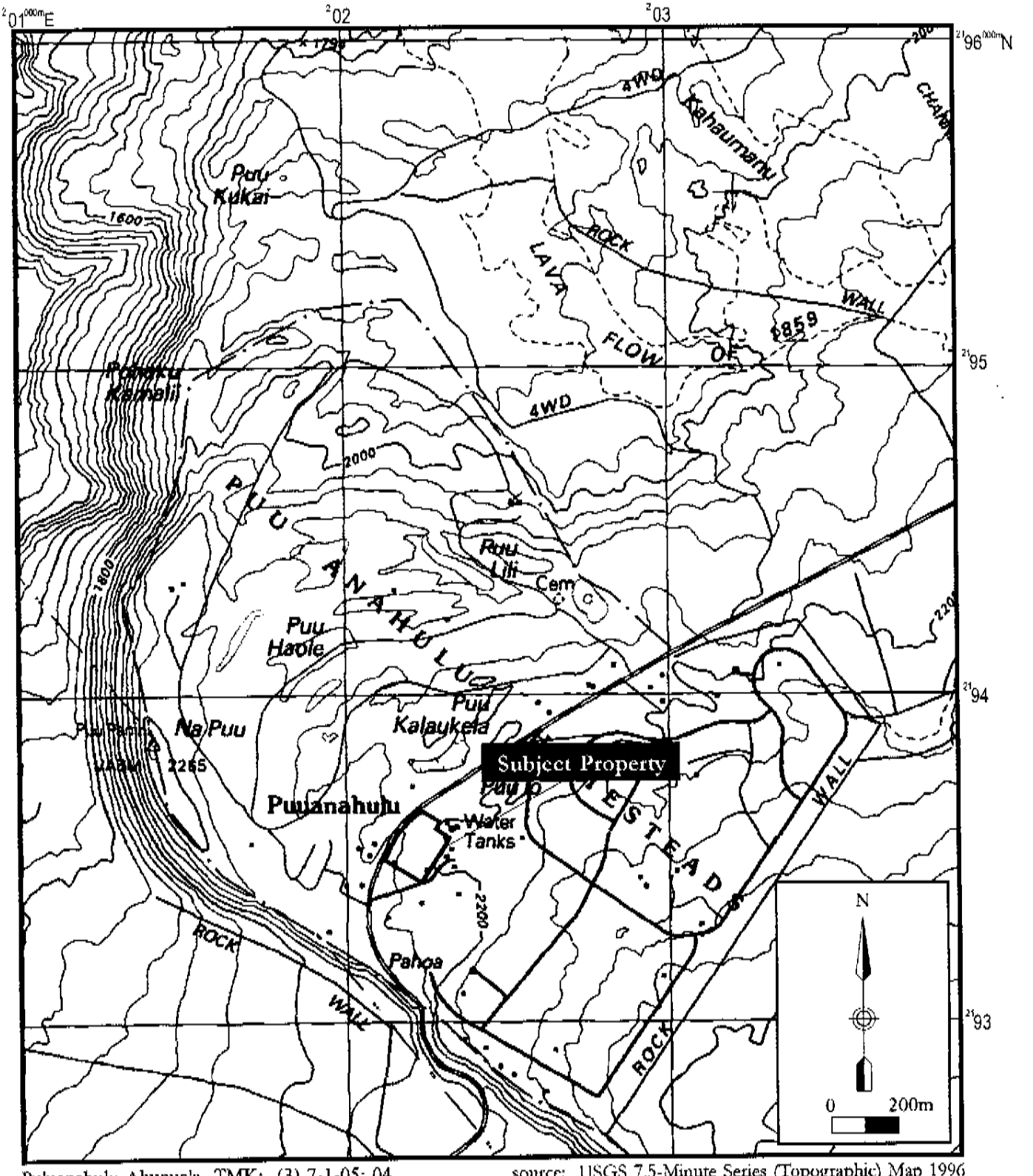
Section 2: Physical Setting

The current subject property consists of a piece of land in Pu'uanahulu Ahupua'a located at TMK: 7-1-05: 04 on the northwestern portion of the island of Hawai'i (Figure 2). Pu'uanahulu is found between the *ahupua'a* of Pu'uwa'awa'a and Waikoloa in the District of North Kona. Pu'uanahulu is adjacent to the borders of South Kohala District to the north and the Hamakua District to the east. The subject property covers a total area of 6.816 acres (see Figure 3). Mamalahoa Highway borders the subject property on the northwest.

The subject property gently slopes from *mauka* to *makai* (roughly east/west) with thin and patchy soils interspersed between outcrops of exposed *pahoehoe*. Visibility on the subject property is good to excellent as the vegetation consisted of low lying shrubs grasses and vines with occasional weeping bottle brush trees *(Calistemon viminalis)*. The lack of vegetation indicates that the subject property has probably been cleared in the recent past.

The soil survey of Hawaii Island depicts the expected soils in the area in which the subject property is located as Rock land, (rRO) 10-15% slopes (Sato, Ikeda, Paeth, Smythe & Takehiro 1971). The Rock land type soil is described as "pahoehoe lava bedrock covered in places by a thin layer of soil material. Pahoehoe outcrops occupy 50 to 90 percent of the surface. The average depth of the soil material is between 6 and 8 inches, although in some places the material extends into the cracks of the lava" (ibid.). Rock land soil extends to elevations ranging from sea level to 13,000 feet (ibid.). Located in western Hawaii, rainfall on the subject property averages between 20 and 30 inches a year (Armstrong 1973). There are no streams or intermittent water channels passing through this portion of Pu'uanahulu.

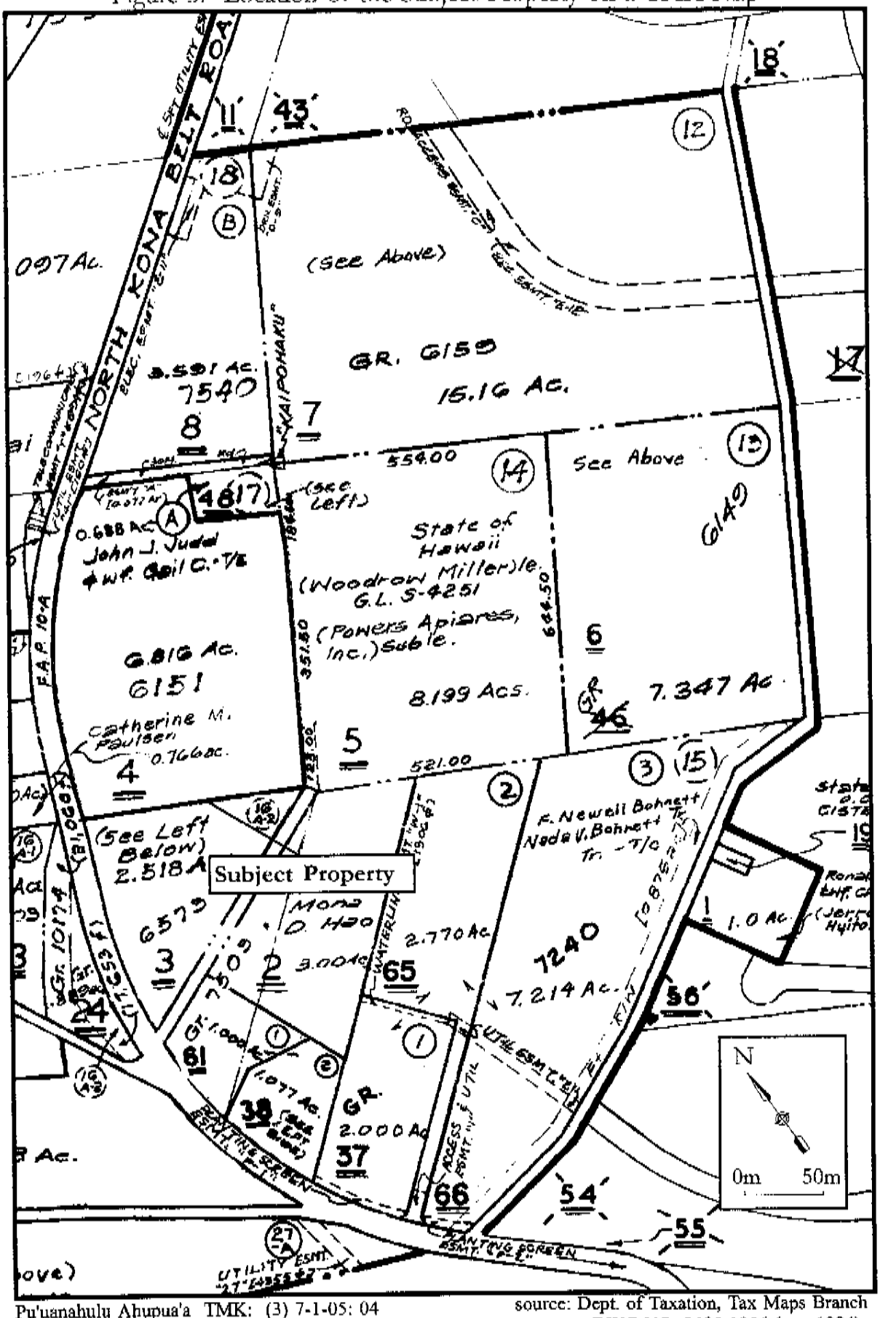
Figure 2: Location of the Subject Property on a U.S.G.S. Topographic Map



Pu'uanahulu Ahupua'a TMK: (3) 7-1-05: 04

source: USGS 7.5-Minute Series (Topographic) Map 1996
Puu Anahulu Quadrangle

Figure 3: Location of the Subject Property on a TMK Map



Pu'uanahulu Ahupua'a TMK: (3) 7-1-05: 04

source: Dept. of Taxation, Tax Maps Branch
DWG NO. 2605 1956 (rev. 1994)

Section 3: Historic Background

Pu'u Nana Estates, is situated within the *ahupua'a* of Pu'uanahulu, in North Kona. The *ahupua'a* of Pu'uwa'awa'a and Pu'uanahulu are also known as Napu'u, meaning 'arched', and was once revered for the plentiful resources associated with the coastal regions and high elevations. The land of Pu'u Nana Estates is formerly a part of the Historic Pu'ulani Ranch. East of the Belt Highway and seven miles inland, Pu'ulani Ranch has been predominately utilized for habitation and ranching, sections of it having been originally granted as Pu'uanahulu Homesteads.

Ancient Hawaiians viewed all things within nature as being interconnected. This belief was a crucial and thus an integral aspect of their lives and the morals that then governed their role within nature as a whole. The land divisions support this ideology. Portioned into a variety of sections, the *ahupua'a* was important for joining all things together. Within the *ahupua'a*, land, sheltered bays, fresh water, forest and mountain resources were all connected and can be broken into three environmental zones: near shore fisheries, or *Kanakai*; shoreward plains, or *Kula Kai*; and inland plains, or *Kula Uka*. With 86,945 acres of land, Pu'uanahulu is one of twenty-three ancient *ahupua'a* within the *'okana* of Kekaha-wai-'ole (Maly 1999). This section provides historic background, both prior to and after Western contact as well as a summary of past archaeological investigations, traditional accounts, settlement patterns, land use, and a summary of expected archaeological finds.

Section 3.1: Legends and Traditional Accounts

Napu'u was once well inhabited and lushly vegetated. Chief Keawe-nui-a-'Umi appointed Ehu as supervisor to this area. Thus, Kona received the name *Kona, kai malino a Ehu,* or Kona, calm seas of Ehu (Pukui, Elbert & Mookini 1974). Bananas, sugarcane, sweet potatoes and yams were once plentiful in this area. The supernatural dog Puapua-lenalena began to steal these crops. The thievery got so great that the lands were left bare and lifeless. *Pahoehoe* covered over half the ground and cultivatable soils were a rarity.

Kapalaoa, the coastal region of Pu'uanahulu, got its name from a traditional account associated with Pele, a supernatural being who is believed to be able to alter her physical form. It is thought by some that she is in fact the hot molten flow and by others that she is in control of it. One day, an old woman approached the doorway to chiefess Kuaiwa's abode. The woman was ill in appearance and begging for fish. At the time of her arrival, the fishermen were returning with tons of various types of fish. Perhaps repulsed by the old woman's appearance, or just lacking empathy, Kuaiwa turned the beggar away, making rude remarks. Soon thereafter, while Kuaiwa was eating fish in her favorite bowl, Pele, who had previously taken the form of the old woman, returned as fire. In an effort to save her life, Kuaiwa ran from her home in such haste that her *lei niho palaoa* (whale tooth pendant) fell from her neck. As it did, Pele turned it to stone. To this day, Kapalaoa, literally translated as whale or whale tooth, has a stone shaped like the apathetic chiefess and her whale pendant (Maly 1999:49).

Section 3.2: Land Use History

From 1580-1600, Liloa, the son of king Kiha "...was at that time the king of all Hawaii" (Malo 1840). The island was sectioned into districts, which were further divided into *ahupua'a*. High chief Ehunuikaimalino controlled Kona District, which Pu'uanahulu is a part of. Ultimately, 'Umi, a direct descendant of Liloa took the rule as King. By the late 1600's to early 1700's, Kalaniopu'u had the lands of Pu'uanahulu. Though historians dispute upon the exact year, in approximately 1754, Kame'eimoku and Kamanawa were then given the lands by Kalaniopu'u. Twenty-eight years later, Kalaniopu'u died, leaving his share of western Hawaii to his son, Kiwalo. In the midst of the chaos associated with the change of land chiefs, Kamehameha, then a predominate land ruler and nephew of Kamanawa, conquered the land from Kiwalo, and made his uncle governor for his aid in doing so. Kamehameha's direct descendants continued to rule the lands far into the 1800's.

Starting from the mid-1700's, *ahupua'a* within the district of North Kona were unable to cultivate enough crops for trade. To aid the economy, Kamehameha decided to accept the introduction of livestock. In 1793, Captain Vancouver introduced cattle, sheep and goats with the stipulation that they were not to be killed for ten years, thus allowing the livestock to breed. By 1800, Kamehameha hired experienced foreigners to care for the livestock. John Palmer Parker, the future founder of Parker Ranch of Waimea, was among the first. Feral livestock was now hunted and domesticated, and *vaqueros* (Mexican-Spanish cow hands) were brought to the islands to teach the locals about handling the cattle. Whaling ships frequented Hawaii, stocking up on salted beef and other provisions for their long journeys at sea. Additional beef was salted and shipped to the American mainland. The island, in particular North Kona District, was rising out of debt. Between 1834 and 1861, $26,000 in revenue came in from beef export. Though this was financially profitable, the lands were being drastically destroyed.

> Some were owned and branded by chiefs and haoles and many were unclaimed, especially on Hawaii. The cattle destroyed lauhala trees...trampled over cultivated land, and ate growing crops...native people were actually driven away from their homes by the depredations of the cattle, and...elsewhere they were discouraged from cultivating the land [as reported in 1848] (Morgan 1948).

By 1851, 20,000 cattle were roaming North Kona District, 12,000 of which were wild. The remaining 8,000 were owned by the King, government, chiefs, and a few foreigners who Kamehameha and Kamehameha III had granted livestock slaughtering rights. The feral cattle were overrunning the lands and, to promote hunting, the government paid huntsmen for dried meats, skins, and hides, all having an export value of $55,542. The livestock rapidly decimated the lands and polluted fresh water resources. All Puu Pa silty loams (see Sato *et al.* 1971), which had the potential of being cultivated fell victim to excessive grazing. The *pa'aina,* or walls, still seen today in the Kona lowlands were constructed to salvage any rich soils and vegetation that would have otherwise been destroyed by the livestock.

> The forest areas of the Hawaiian Islands were very considerable, covering the upland plateaus and mountain slopes at altitudes above the lands now devoted to sugar growing

> and other cultures. Those areas, however, have suffered great reduction, and much of the most valuable forest cover has been devastated and laid bare. The causes given, and to-day seen, of the great destruction that has occurred are the direct removal of forest without any replacement by replanting. Again in consequence of the wholesale crushing and killing off of forest trees by cattle which have been allowed to traverse the woods and to trample out the bush and the undergrowth which protected the roots and trunks of trees, vast breadths of superb forests have dried up, and are now dead and bare. All authorities of the past and of the present agree in ascribing to mountain cattle, which were not confined to ranching areas, but allowed to run wild in the woods, the chief part in the decimation of the forest covered lands (Maxwell in Thrum 1900).

Section 3.3: The Mahele of 1848

The Great Mahele took place during the reign of Kamehameha III, defining and dividing land interests. It allowed non-Hawaiians to control land through purchase or lease. Land chiefs and *konohiki* would make a claim to the land commissioners, and from there Kamehameha III would award them use of property, though the titles would remain with the government. These lands came to be known as Konohiki Lands. Ultimately, the domains were placed into three categories: the King's Land, or Crown Land, Government Lands and Konohiki Lands. In 1850, the Kuleana Act allowed Land Commissioners to issue property to farmers who would cultivate for their own subsistence. These lands came to be known as *kuleana*, meaning title, jurisdiction and/or authority (Elbert & Pukui 1971). Over 30,000 acres were awarded as *kuleana* lands. In the 1860's the 20,000 acres of Pu'uanahulu that had originally belonged to Kamehameha III became part of government lands.

With exception of the native tenants who were granted rights to utilize the lands for their own sustenance, all of Pu'uanahulu was leased to 3 residents of Honolulu: G. Kaukuna, M. Maeha and S. Kanakaole. Two years later, they were sold to Francis Spencer for incorporation into Waimea Grazing and Agricultural Company. Table 1 presents information concerning the leases and land transfers regarding Francis Spencer's properties.

With the intent of giving more Hawaiians the opportunity to possess fee-simple property, the Homestead Act of 1884 was created. On the island of Hawai'i, several lands in the Kekaha region of North Kona were selected and a surveying program initiated to open up the lands. Because it was the intent of the Homestead Act to provide residents with land upon which they could cultivate crops or graze animals, most of the lots were situated near the *mauka* road that ran through North Kona (Maly 1999:137).

As Francis Spencer's lease on Pu'uanahulu would expire in 1895, a petition for Homestead Development from 38 residents of Napu'u was submitted to the Minister of the Interior (Hawaii State Archives; Interior Department – Land Files in Maly 1999:139). In compliance with the Homestead Act and Land Act of 1895 (which defined three types of homestead agreements), the Hawaiian Government Study conducted the survey and lay out of 40 lots for homestead purposes in Pu'uanahulu in 1897 (ibid.).

Table 1: Pu'uanahulu Leases

From whom	To whom	Parcel	Date	Lease Number	Comments
Kamehameha	G.Kaukuna, M. Maeha, S. Kanakaole	Entire *ahupua'a* of Pu'uanahulu, with exception of native tenants land rights	March 20, 1863, for 5 years	106	
G.Kaukuna, M. Macha, S. Kanakaole	The Waimea Grazing and Agricultural Company; Francis Spencer	Entire *ahupua'a* of Pu'uanahulu, with exception of native tenants land rights	March 20, 1865		Renewed in 1870, 1874
Francis Spencer	Miss Frances Tasmania Spencer, daughter of Francis	Entire *ahupua'a* of Pu'uanahulu, with exception of native tenants land rights	Aug. 30, 1875		
Miss Frances Tasmania Spencer, daughter of Francis	Francis Spencer	North Kona Pu'uanahulu with the exception of *Kuleana*	Dec. 22, 1879	206	

June 21, 1905. D. Alapai Jr. a native resident of Puuanahulu, aged 25 years, applied for Puuanahulu Lot 3, under the Homestead Lease System. (D. Alapa'i Jr., stated that Like Kaihemakawalu, the original applicant, was his late wife.). Grant 5913 was later given to Lizzie Alapai (Kaholo) on April 15, 1913 (ibid.:140, 147).

June 21, 1905. Akoni Kaleo, a native residing at Puuanahulu, aged 47 years, applied for Pu'uanahulu Lot 4, under the Homestead Lease System – 28.0 acres. Mrs. Louisa Keawe (L.K. Alapai) was given this lot on September 2, 1924 (ibid.:141, 147).

Report No. 2 of the Homestead Occupation Leases reports whether or not lessees had fulfilled certain requirements in order to obtain the title to their lot. It is recorded that after a field inspection, both Lots 3 and 4 had "nothing done" on them (ibid.142). Both of these grants were also subsequently conveyed to R. Hind or R. Hind, Ltd. (ibid.:146).

Most of the homestead lands were located *mauka* in North Kona. The majority of the populace voiced to land commissioners that the land was "insufficient" to live on in every respect (Dye *et al.* 2002). The rocky mountain terrain was suited for goats only. In a statement sent to land commissioners in 1920, Mrs. Kihe, a woman who maintained her home since 1914, avowed: "At present a very small patch of potatoes and onions is cultivated; if not for the dry area a larger area would be cultivated. Twenty trees growing. Land only fit for cactus" (Dye *et al.* 2002).

Adequately summarized by Mr. Kihe, a native man who saw the lifestyle changes associated with the ranching and the Homestead Act, Pu'uanahulu had become inadequate for living.

> Today, the families are lost, the land is quiet. There are no people, only the rocks and trees remain, and only occasionally does one meet with a man today. (Kaloko) is like that place mentioned above, it is a land without people at this time. The men, women, and children have all passed away...Now the land is desolate, there are no people, the houses are quiet. Only the houses remain standing, places simply to be counted (ibid.).[1]

Despite community outcries, the ranching continued its expansion. Starting in 1917, lands in Pu'uwa'awa'a and Pu'uanahulu were leased by Senator Hind for the growth of Pu'ulani Ranch. Hind purchased lease #971 for 74,000 acres in Pu'uanahulu for $1001, #1038 for 12,000 acres in Pu'uanahulu for $501 and #1039 for 40,000 acres in Pu'uwa'awa'a for $3001 (Maly 1999). Generally, these lands seemed adequate for grazing. The sparse Puu Pa silt loams allowed high grasses to grow freely. Pu'uwa'awa'a Hill, among the land leased to Hind, was 10-11 miles from the shore. The land was fit only for potatoes and taro. Natives had attempted to grow coffee beans in the past, but the land failed to support the crop. By the time Hind leased this area, there were no native *kuleana*, nor were there any in the surrounding land. At the edge of

---

1 Kihe made previous mention of the similarities between the lands within North Kona, in this case, the likeness of Kaloko and Pu'uanahulu

> ...the lands of 'O'oma, Kalaoa, Hale'ohi'u, Maka'ula, Kau, Pu'ukala-'Ohiki, Awala,the lands of Kaulana, Mahai'ula, Makalawena, Awake'e, the lands of Kuki'o, Ka'upulehu, Kiholo, Keawaiki, Kapalaoa, Pu'u Anahulu, and Pu'u Wa'awa'a. (Dye, *et al.* 2002)

Pu'uanahulu and Anaehoomalu was a small *heiau*, and bordering Pu'uanahulu and Pu'uwaa'waa was a living house known as Kaauoha's grass house (ibid.). All this leased land was predominately hilly, with steep faces rising from the *a'a* plains. Robert Hind died in 1938, leaving his ranch under trustee John K. Clarke. On July 1, 1958, Pu'uwaa'waa Ranch was sold to Dillingham Ranch, Inc.. At the time, Dillingham and F.N. Bohnett had joint tenure. Bohnett kept his relationships with numerous native families, eventually acquiring ownership of Pu'uanahulu Homesteads. By 1986, he began development of Pu'ulani Estates, a housing subdivision adjacent to Pu'u Nana Estates Subdivision.

Section 3.4: Past Archaeological Survey

The earliest surveys of the Pu'uanahulu area were performed in the early 1900's. In 1909, J.F.G. Stokes traveled across portions of Napu'u and recorded the presence of an extensive field of petrogylphs (Stokes 1910:59-60). Later surveys and investigations of this area were performed in 1919-1920 by A. Baker and in the 1930's by J. Reinecke, the latter which, with the use of better maps, placed the field of petroglyphs in 'Anaeho'omalu. However, in 1919, J. Lynn, manager of Pu'u Wa'awa'a Ranch informed Baker of additional petroglyphs which were not documented present in the Puako area (Maly 1999).

J. Reinecke was contracted by Bishop Museum in 1930 to survey Hawaiian sites in western Hawai'i. Traveling along the coast of Kekaha, Reinecke mentioned that the economy of the area was based on fishing while agricultural practices could be performed in the *mauka* areas. He observed a limited number of sites in the region which included walls, salt pans, platforms, shelters, enclosures, caves and pens in the area between Pohakuokahae (on the Ka'upulehu-Pu'u Wa'awa'a boundary) to Keahualono on the Pu'u Anahulu-'Anaeho'omalu (North Kona-South Kohala boundary)(Reinecke 1930).

In 1980, Chiniago, Inc. conducted an archaeological survey at Kapalaoa, the area along the Pu'uanahulu coast. The survey, which was 500m long and 150m wide, yielded mostly historic sites after having been heavily impacted by 20th century ranching. Petroglyphs, several habitation shelters, including two habitation caves, a habitation terrace, a grave, walls, mounds, a possible shrine, midden piles and a trail were identified and documented by Chiniago, Inc..

In 1990, 460 acres of land *makai* of the Pu'ulani Ranch were investigated by PHRI, Inc. (Walker, Kalima & Rosendahl 1990) and further investigated again three years later (Jimenez 1994). The intense ranching that marked the past resulted in the recovery of additional historic sites and no typical ancient Hawaiian features.

By 1991, Cultural Surveys Hawai'i, LLC. (CSH) analyzed 550 acres of the lower *kula* of Pu'uanahulu, *mauka* of Queen Ka'ahumanu Highway, southeast of the Pu'ulani Ranch site, this time emerging with six traditional Hawaiian sites: a habitation cave, four temporary shelters and a scoria quarry. The little visible impact was indicative of the area being used for temporary habitation (Borthwick, Folk, Hammatt & Stride 1991).

In the south and southwest region of Pu'uanahulu Ahupua'a, CSH yielded additional historic sites in a 1992 inventory survey (Hammatt & Borthwick 1992).

In the year 2000, the International Archaeological Research Institute (IARII, Inc.) surveyed 150 acres of Pu'ulani Ranch (Phase II) in the inland portion of Pu'uanahulu, *mauka* of Mamalahoa Highway, seven miles from the ocean at approximately 2300 feet elevation. IARII conducted land and lab investigations, researched historical documents, and interviewed individuals with a past link to the Pu'uanahulu homesteads in the 20th century (Dye *et al.* 2002). These archaeological investigations conducted by T.S. Dye, who was assisted by Kepa Maly, supplemented research documented by Barerra (1997). Twenty-two sites originally identified by Barrera (1997) were relocated with relative confidence by Dye and Maly. Sites included three terraces, four mounds, one modified outcrop, two enclosures, seven sites identified as graves, one historic road, three walls and one wall complex. Eleven additional sites were identified by Dye as well as a number of features at three previously identified sites. These additional sites are all associated with historic habitation and are comprised of walls, enclosures, overhang shelters, a platform and a modified outcrop.

Sites associated with the homestead of Henry Ha'o were identified by Charlie Aipia and include Sites 18483, 18484, 18485, 18934 and 18935. Given the significance evaluation "no longer significant" in Barrera's 1997 archaeological inventory survey, supplemental archaeological investigations performed by Dye *et al.* (2002) re-evaluated Site 18483, a "flat-topped outcrop faced on three sides and an adjoining enclosure" as significant under criteria C and D (ibid.). Preservation was recommended as the site was determined to be "a good example of an early 20th Century Hawaiian homestead" (ibid.).

Testimony provided by knowledgeable descendants and residents of Pu'uanahulu provided valuable information on land use and the location of sites and burials. Inventory Survey investigations included informant testimony recorded by Helen Wong Smith. Research conducted in 1993 for Parcels 15, 16, 17 and 76 of Pu'ulani Ranch Phase II included interviews with Leina'ala Lightner and Debralee Ka'iliwai-Ray, two life-long residents of Pu'uanahulu. Ms. Lightner was able to identify the location of four graves at the area identified as Pu'u o Kalaukela. Recalling what her father, the late Robert Keakealani had told her, Ms. Lightner said the graves date to the early 1800's. The majority of the parcel discussed during the interview falls within Grant 8580, to Kelii Aipia. Neither woman had any knowledge of the family that the graves belonged to, however, it is highly likely that they could belong to the Ha'o family, of which Ms. Ka'iliwai-Ray belongs due to the proximity of the Ha'o home which is adjacent to the parcel included in that study (Barrera 1997:21).

Helen Wong Smith also conducted interviews with Charles Aipia, John Ka'iliwai and his daughter Debralee Ka'iliwai-Ray on July 30, 1996. The Aipia family were in Pu'uanahulu during the homestead era where John Kelii Aipia, Charles Aipia's grandfather was awarded Grant 8560 and includes Pu'u o Kaiwi on which Pu'ulani Ranch parcel 76 is located. He reported that this area contained some of the best farming land in the vicinity (Barrera 1997:58). Sites 18499 and 19415 of Barrera's investigations

were located on this grant parcel and include a rectangular stone terrace and gravesites with 2 stones, one with the inscription "Hanari."

The Ka'ula Ha'o and Ka'iliwai families verified family graves and were able to aid in the identification of foundations and agricultural/ranching areas. Their information allowed archaeologists to identify burials 18495 and 18496 as a Hao family grave. The graves of Site 19415 are known locally as the Pu'u o Kaiwi. Locals identify its upper section as being an old cemetery of approximately 30 to 40 graves. It is speculated that this cemetery may have been utilized during the time of the Pu'ulani Ranch.

Other informants consulted during the initial Inventory Survey investigations included Ms. Margie Kaholo Kailianu who was able to provide valuable information on sites and their function as well as identifying graves located in the area known as "Ikeaka." She also identified the area in the vicinity of Lots 1 and 2 (north of Site 18483) to contain gravesites and is known as "Kamelelau" (Barrera 1997: 17).

Helen Wong Smith also interviewed individuals such as Mr. Yasuichi Iwamasa and Mr. Sanshiro Yano who worked at Pu'uwa'awa'a Ranch and were able to provide information regarding the ranching period and activities which occurred in the area.

Sites 18494 and 18495, the original location of Kawaimaka Ha'o's homestead parcel at Lot 115, were the subject of IARII's Burial Treatment Plan (Magnuson 2004).

> Feature A of Site 18495, a burial platform has been identified by Kapeliela (1994) as a Hao family grave containing a 'great-granduncle and twin grand-aunts of Debralee Ka'iliwai-Ray.' Other features within the same archaeological site include a disturbed stacked stone wall (Feat. B), an historic artifact scatter (Feat C.), and a natural crevice in lava that is believed by family members to be a gravesite and which is marked by a small growth of bougainvillea. Site 18494, a gravesite marked by lily plants, is less than 2 m south of Site 18495 Feature A (Magnuson 2004).

Section 3.5: Settlement Patterns

Based upon the information concerning previous land uses and archaeological work conducted in the immediate vicinity of the subject property, the prehistoric settlement pattern which likely existed in this area of Napu'u and the *ahupua'a* of Pu'uanahulu in particular can be summarized. The earliest utilization of the area, perhaps as early as the tenth century, likely took the form of temporary coastal sites which provided access to the nearby littoral resources. Permanent habitation began around the twelfth and thirteenth centuries. As the population of the island increased, following 'Umi's transfer from Waipi'o to Kona in particular, an increase in permanently occupied sites were subsequently established and potential agricultural areas inland were exploited. Permanent settlement was likely located in coastal areas in the vicinity of a permanent source of fresh water as well as in areas providing access to the coastal resources.

Several factors contributed to the changes in historic settlement patterns which resulted in an increase of population in the upland regions and decrease in the coastal population one of them being the introduction of goats and cattle in 1793 by Vancouver.

By 1860, ranching began to dominate the land and by the early 1900's most of the native population had begun to relocate (Ching 1971:38). In the late 1800's, a population shift from the coastal area to the uplands along the present Mamalahoa Highway took place (Yent 1991:7). The Great Mahele of 1848, the Kuleana Act of 1850 and the Homestead Act of 1884 introduced the idea of land ownership and encouraged Hawaiians to own and cultivate land.

Section 3:6: Expected Finds

The above compilation of past archaeological finds and historic reviews conclude that the remaining undocumented archaeological sites will be mostly post-Contact, specifically dating to the Homestead era of the late 1800's following the Homestead Act of 1884. As the subject property is located within homestead leases, it is expected that homestead features identified by informant testimony and archaeological inventory survey investigations in the vicinity of the project area will be encountered. Such sites include walls and platforms associated with habitation and agriculture, graves and small-scale livestock enclosures during the homestead period at Pu'uanahulu.

Personal communication with the land owner, as well as the current tenant indicated the presence of burial markers on the subject property near the existing residence, though the extent of the burial ground is unknown. Additional ranching and habitation features may also exist and could include mounds, walls with the purpose of both property identification and livestock enclosure, graves, foundations and terraces. Since ranching dominated the land by the 1800's, the probability of finding undestroyed prehistoric habitation sites is less likely, though isolated artifacts should not be ruled out.

Section 4: Archaeological Methods

The current archaeological investigations were conducted from August 30th to September 1st, 2005. All fieldwork was conducted under the direction of the Principal Investigator, Joseph Kennedy, M.A.. Fieldwork was conducted by Field Archaeologists Michael O'Shaugnessy, B.S. and Mina Elison, B.A.. Fieldwork methods consisted of a 100% surface survey of the subject property.

A pedestrian survey was utilized to systematically investigate the subject property. The purpose of the pedestrian survey was to identify all potentially significant historic properties which may be located on the surface of the subject property. The pedestrian survey was conducted by the field archaeologists who swept the parcel on foot using transects spaced approximately 10 meters (m) apart. Transects were oriented roughly northeast/southwest. Visibility was good to excellent due to the lack of significant vegetation. Through the use of this procedure, a 100% surface survey of the subject property was completed and all potentially significant historic properties were identified.

When features believed to be potentially significant historic properties were encountered during the pedestrian survey they were flagged with engineer's flagging tape marked with the date, company name (ACP) and temporary identification numbers using the prefix "TF" to indicate the temporary "feature" designation. Features which, upon completion of all investigations, were determined to be significant historic sites were subsequently assigned the permanent State Site number used in this document.

No subsurface investigations were carried out as the only site identified was a previously noted burial ground. Sufficient surface information was present to make a determination that features encountered were human burials and subsurface disturbance was not necessary. Notes were taken in the field describing the environmental setting of the subject property including indications of former modifications and/or modern developments made to the parcel. Plan views were drawn to scale of each surface feature encountered. All of these methods in data collection were conducted in order to provide an accurate and detailed visual and written record of the findings on the subject property. The methods utilized aided in the production of an accurate and detailed report along with a determination of site significance and the impact of future construction endeavors.

In order to identify the family or families belonging to the burials locates on the subject property, several individuals who are recognized by the DLNR-SHPD as cultural descendants of Pu'uanahulu were contacted, consulted and informally interviewed in person on September 10, 2005 at the Pu'uanahulu Community Center. Based on the testimony of Mr. Howard Alapai, Mr. Levi Robert Mitchell, Ms. Shirley Keakealani and Ms. Leina'ala Lightner, the burials belong to the Maka'ai family who once lived on the current subject property during the Homestead Period. It is believed by the consulted

informants that known descendants of the burials have since then moved away and/or deceased.

Subsequent to the initial community consultations of September 2005, at the request of the DLNR-SHPD in correspondence dated October 4, 2006 (LOG NO: 2006.3278; DOC NO: 0610JT19), ACP conducted additional consultations with known lineal descendents of the Pu'uanahulu area, Ms. ShirleyAnn Keakealani, Ms. Mahana Gomes, Mr. John Ka'iliwai and Ms. Debralee Ka'iliwai-Ray, who accompanied the field crew on a site visit on November 15, 2006. The informants were able to confirm that the burials at Site 24739 were indeed of the Maka'ai Family. The Maka'ai Family descended from two brothers named Maka'aiali'i and Maka'ainui. The informants recollections were that the most recently interred individual was Joseph Maka'ai who was one of around 25 siblings. Joseph Maka'ai is believed to have passed away and interred at Site 24739 sometime in the 1940's. The informants were unsure of the names of the other individuals interred at the site but believe that they included Joseph Maka'ai's parents, aunts, uncles and siblings.

Section 5: Archaeological Findings

Archaeological investigations conducted by ACP systematically surveyed the entire subject property. One site was identified during the current investigations consisting of a graveyard, which, according to knowledgeable community informants, belongs to the Maka'ai Family. Each feature identified in the current survey will be described below and is summarized in Table 2.

Section 5.1: Site Description

Table 2: Site and Feature Summary		
Site	Feature	Structure
24739	A	Terrace
	B	Alignment
	C	Alignment/Enclosure
	D	Alignment
	E	Alignment
	F	Alignment/Enclosure
	G	Alignment/Enclosure
	H	Alignment/Enclosure
	I	Alignment/Enclosure
	J	Alignment/Enclosure
	K	Platform

Site 24739

Site 24739 is comprised of a burial complex and is located on the southeast portion of the subject property (see Figure 4 for approximate location). At the time of this writing, the exact location of this burial complex still needs to be plotted by a surveyor. This site is comprised of 11 individual features, 10 of which are interpreted as burial markers (Features B-K). Angular basalt construction stones varied from 10 - 40cm in diameter.

Feature A is a large tumbled terrace located southwest of Features B-K (see Figure 5). It is approximately 14.3m long and 1m wide with a height ranging from 12-60cm. This feature is constructed of medium-large basalt stones and is in deteriorated condition. Adjacent on the northeast side of the terrace is a level soil area between Feature A and Features B-J.

Figure 4: Location of Site 24739 on a Map of the Subject Property

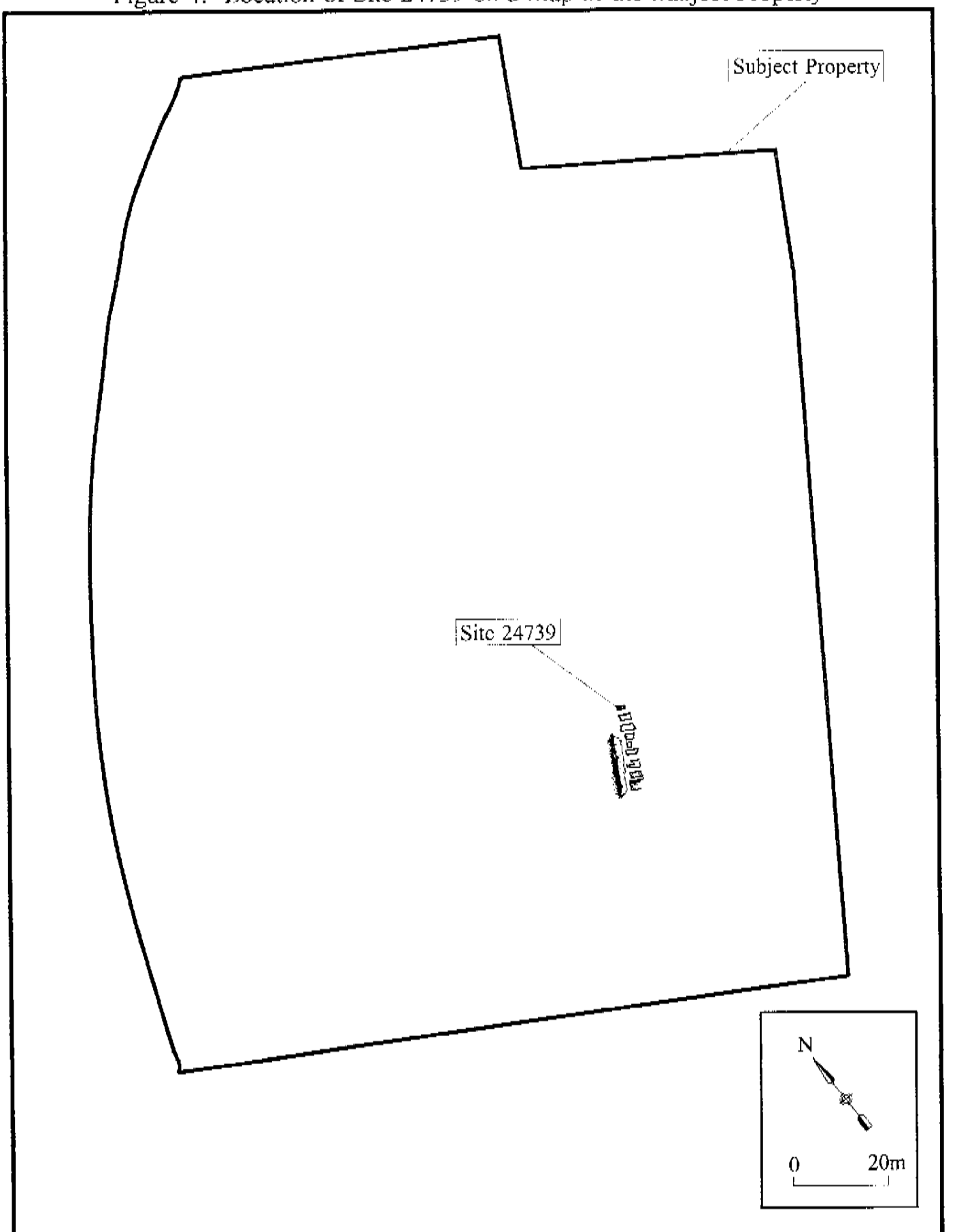
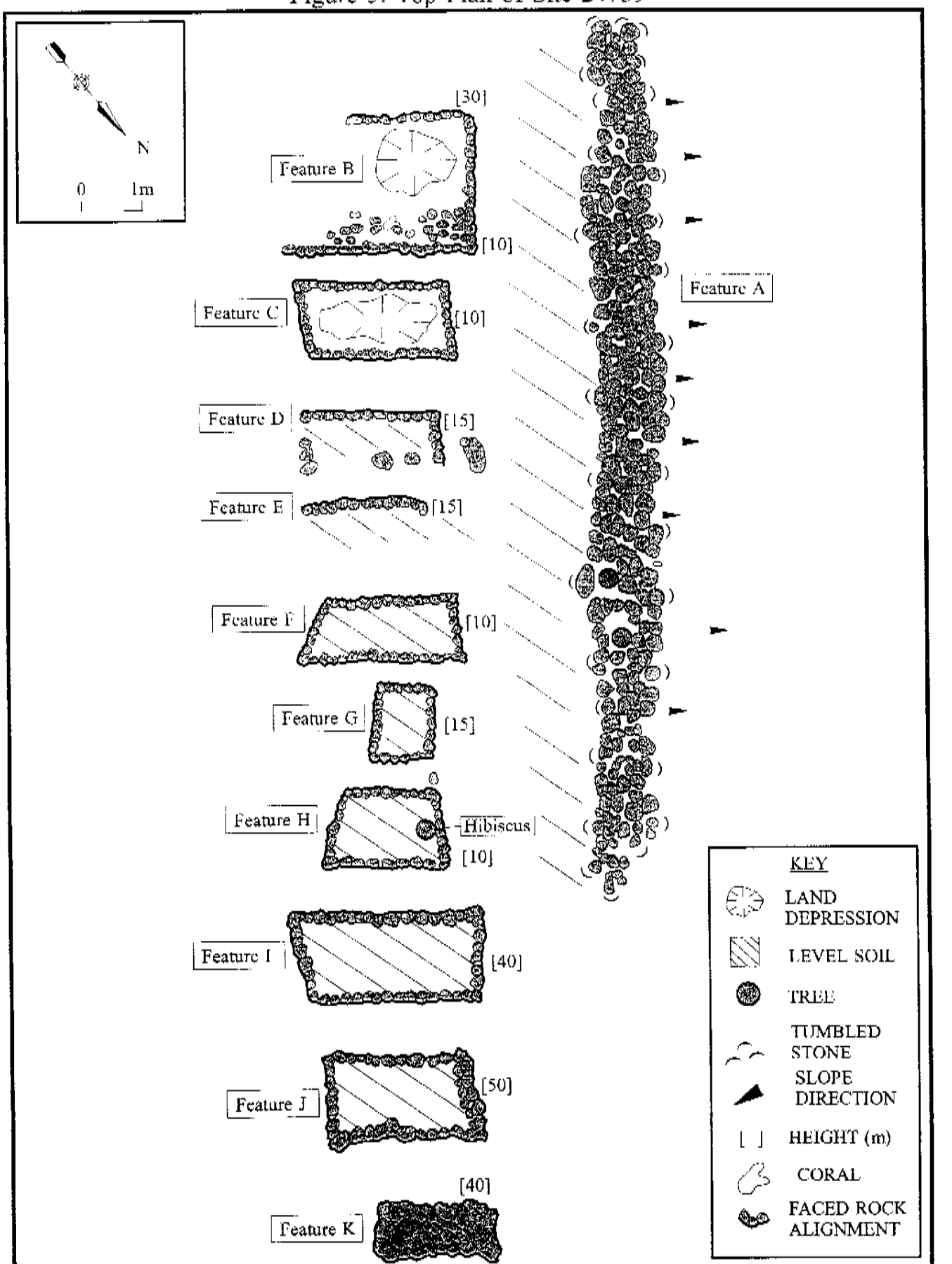


Figure 5: Top Plan of Site 24739



Pu'uanahulu Ahupua'a TMK: (3) 7-1-05: 04 Archaeological Consultants of the Pacific, Inc. 2006

Feature B is a stone alignment forming a partial rectangular enclosure open to the southeast. At its largest dimensions it measures 3.1 by 2.2m with a height range of 10-30cm. The southwestern portion has an oval shaped depression which suggests coffin collapse and branched coral was observed on the roughly paved northeastern portion.

Feature C is a roughly rectangular alignment with an oval depression in the center. It measures 2.6 by 1.4m and 10cm tall. It is constructed of small stones and faced on all four sides.

Feature D is a stone alignment with facing on the southwest. The southern most alignment is L-shaped and measures 2.2 by 0.9m and 15cm tall. Scattered stones indicated that this alignment may have been rectangular at one time.

Feature E is a stone alignment with facing on the southwest. It is 1.1m long 15cm tall and runs parallel with the length of Feature D. Scattered stones indicated that this alignment may have been rectangular at one time.

Feature F is a stone alignment forming a roughly rectangular enclosure with facing on the entire exterior. At its largest dimensions it measures 2.9 by 1.2m and 10cm tall and is constructed of small stones.

Feature G is a stone alignment forming a rectangular enclosure with facing on the entire exterior. It is the smallest of the burial enclosures at this site measuring 1 by 1.3m and 15cm tall. It is constructed of small and medium stones.

Feature H is a stone alignment forming a roughly rectangular enclosure with facing on the entire exterior. A hibiscus bush is planted in the northwestern portion of the enclosure. At its largest dimensions it measures 2.1 by 1.4m and 10cm tall and is constructed of small-medium stones.

Feature I is a large stone alignment forming a roughly rectangular enclosure with facing on the entire exterior. At its largest dimensions it measures 3.2 by 1.6m and 40cm tall and is constructed of small-medium stones.

Feature J is a stone alignment forming a rectangular enclosure with facing on the entire exterior. The northwestern side has two parallel courses. Feature I measures 2.6 by 1.4m and 50cm tall.

Feature K is a rectangular stone platform constructed of small and medium angular basalt stones with facing on all four sides and a level stones paved surface. It measures approximately 2 by 1m with a height of 40cm.

Section 5.2: Discussion of Archaeological Findings

Based on the morphology of the features in this burial site (24739) and testimony from community informants regarding the Maka'ai burials, an assumption can be made concerning the period of usage. Features A and B exhibit depressions which are often interpreted as a sign of coffin collapse indicating post-Contact interment. This assumption does not preclude the possibility that this burial ground was used prior to Western Contact, in which case there may also be additional unmarked burials in the vicinity. While the use of a low course of stone is indicative of native Hawaiian burial practices of the early post-Contact period, informant testimony and the known occupation of the property during the Homestead Period dates the burials to the late 1800's through the 1940's. Based on the number of features present and the larger size of Feature B it is likely that a minimum of 11 individuals are interred at Site 24739.

Section 6: Evaluation of Site Significance

Significance Evaluations

One site of significance to the interests of historic preservation was identified during the current investigations. Site 24739 consists of a graveyard with at least 11 individuals interred within. This site qualifies to be considered significant under Criteria D (the site is likely to yield, information important in prehistory or history) and E (the site has Cultural Significance such as *heiau*, shrine, burial, etc.) of the Hawaii Register of Historic Places criteria.

Table 3: Summary of Site Significance Evaluations

Site	Description	Function	Significance Evaluations
24739	Burial Complex	B	D & E

Functional Interpretations
B: Burial

Code For Significance Evaluation Criteria
A: Site is associated with events that have made a significant contribution to the broad patterns of history.
B: Site is associated with the lives of persons significant in the past.
C: Site embodies the distinctive characteristics of a type, period, or method of construction; or is the work of a master; or possesses high artistic values; or represents a significant and distinguishable entity.
D: Site has yielded or is likely to yield information important in prehistory or history
E: Site has Cultural Significance (*heiau*, shrine, burial, etc.).

Criteria A-E represent Hawaii Register of Historic Places criteria.

Recommendations

Archaeological Consultants of the Pacific, Inc. recommends that a determination be made that future construction activities would have an "effect" on significant historic properties. Because of the presence of human burials at Site 24739, it is also recommended that Site 24739 be preserved "as is" and that on site archaeological monitoring take place during any future subsurface construction activities conducted in the vicinity of the site the details of which will be presented in a separate Burial Treatment Plan as well as an Archaeological Monitoring Plan.

Conclusion

An Archaeological Inventory Survey has been conducted on property located in Pu'uanahulu Ahupua'a, North Kona District on the Island of Hawai'i. The purpose of the current investigations was to determine if significant historic properties exist within the project limits and, if present, properly document and evaluate those sites. One site (Site 24739) of significance to the interests of historic preservation was identified during the surface survey.

Based upon the results of the current investigations, Archaeological Consultants of the Pacific, Inc. recommends that a determination be made that future construction activities would have an "effect" on significant historic properties. Because of the presence of human burials at Site 24739, it is also recommended that Site 24739 be preserved "as is" and that on site archaeological monitoring take place during any future subsurface construction activities conducted in the vicinity of the site the details of which will be presented in a separate Burial Treatment Plan as well as an Archaeological Monitoring Plan.

References Cited

Armstrong, R. Warwick
1973 *Atlas of Hawaii.* Department of Geography, University of Hawaii. The University Press of Hawaii: Honolulu.

Baker, A.S.
1919 *More Petroglyphs (Puuanahulu and Honokohau), The Hawaiian Almanac and Annual for 1919: 131-135.* Thos. G. Thrum, Honolulu, Hawaii.

Barrera, Jr., William
1980 Cultural Resources Survey at Kapalaoa, North Kona, Hawaii. CHINIAGO, Inc., Honolulu, Hawaii.

1993 "Puu Anahulu, North Kona, Hawaii Island: Archaeological Inventory Survey of Puulani Ranch Phase II [TMK: 7-1-05: multiple]." DRAFT. CHINIAGO INC., Kamuela, Hawaii.

1997 "Puu Anahulu, North Kona, Hawaii Island: Archaeological Inventory Survey of TMK: 7-1-05 (multiple)."

Borthwick, D., W. Folk, H. Hammatt, and M. Stride
1991 "Archaeological Survey for the Proposed West Hawai'i Landfill, Pu'uanahulu, North Kona, Hawaii (TMK 3-7-1-1)." Cultural Surveys Hawaii, Kailua, Hawaii.

Ching, Francis K.W.
1971 "The Archaeology of South Kohala and North Kona, From the ahupua'a of Lalamilo to the Ahupua'a of Hanamana, Surface Survey Kailua-Kawaihae Road Corridor (Section III). Div. State Parks, Outdoor Recreation and Historic Sites." Department of Land and Natural Resources.

Dye, T., K. Maly, J.S. Athens
2002 "Supplemental Research to Support an Archaeological Inventory Survey of Puu Lani Ranch Phase II, Pu'u Anahulu, Kona, Hawai'i." International Archaeological Research Institute, Inc., Honolulu, Hawaii.

Elbert, S. and M. Pukui
1971 *Hawaiian Dictionary.* University of Hawaii Press: Honolulu, Hawaii.

Hammatt, H. and D. Borthwick
1992 "Data Recovery and Preservation Plan for Archaeological Sites in the Proposed West Hawai'i Landfill, Pu'uanahulu, North Kona, Hawai'i (TMK 3-7-1-1)." Cultural Surveys Hawaii: Kailua, Hawaii.

Jimenez, Joseph A.
1994 "Additional Archaeological Inventory Survey, Big Island Country Club Estates. Land of Pu'uanahulu, North Kona District, Island of Hawai'i (TMK: 3-7-1-05: 9, 10, 22, 58, 59)." Paul H. Rosendahl, Ph.D., Inc. Hilo, Hawai'i.

Kapeliela, Kana'i
1994 November 16 Memorandum to File re: Summary of burial sites identified in Pu'uanahulu Phase II Project w/ recommendations. On file, State Historic Preservation Division, Kapolei, Hawai'i.

Kuykendall, R. S.
1938 *The Hawaiian Kingdom*, 1778-1854. Vol. 1. University of Hawaii Press, Honolulu.

Malo, David
1951 *Hawaiian Antiquities: Mo'olelo Hawai'i.* Bernice P. Bishop Museum, Special Publication 2, Second Edition. Bishop Museum Press: Honolulu, Hawai'i.

Maly, Kepa
1999 *Volume I: Pu'uanahulu and Pu'uwa'awa'a (Napu'u), at Kekaha-Kona, Hawai'i.* Hui 'Ohana Mai Pu'uanahulu a me Pu'uwa'awa'a & Kumu Pono Associates, Hilo, Hawai'i.

Magnuson, Coral M.
2004 "Burial Treatment Plan for Sites 50-10-20-18494 and 50-10-20-18495 at Puu Lani Ranch Phase II, Pu'u Anahulu, Kona, Hawai'i TMK: 7-1-06:115." IARII, Honolulu, Hawai'i.

Morgan, T.
1948 *Hawaii: A Century of Economic Change, 1778-1876.* Harvard University Press, Cambridge, Massachusetts.

Pukui, M., S. Elbert, E. Mo'okini
1974 *Place Names of Hawaii.* The University Press of Hawaii: Honolulu, Hawaii.

Reinecke, J.
1930 *Survey of Hawaiian Sites, 1929-1930.* Manuscript in Department of Anthropology, B.P. Bishop Museum, Honolulu, Hawaii.

Sato, Ikeda, Pacth, Smythe & Takehiro, Jr.
1971 *Soil Survey of the Island of Hawaii, State of Hawaii.* U.S. Department of Agriculture - Soil Conservation Service and University of Hawaii Agricultural Experiment Station. Washington, D.C., Government Printing Office

Stokes, J.F.G.
1910 *Notes on Hawaiian Petroglyphs*. Director's Report for 1909. Bishop Museum Press, Honolulu, Hawaii.

Thrum, T.G.
1900 Excerpt from *Hawaiian Annual.* Honolulu, Hawai'i.

Walker, A., L. Kalima and P. Rosendahl
1990 "Archaeological Inventory Survey, Royal Vistas Estates Development, Land of Puuanahulu, North Kona District, Island of Hawaii (TMK: 3-7-1-05:26-34, 39-41)." PHRI: Hilo, Hawaii.

Yent, Martha
1991 "Archaeological Reconnaissance Survey: Makaula-Ooma Mauka Tract, North Kona, Island of Hawai'i. Division of State Parks, DLNR, Honolulu, Hawai'i.