CHARMAINE TAVARES
Mayor

KATHLEEN ROSS AOKI
Director

ANN T. CUA
Deputy Director

DEC 23 2010

NOV 30 2010

COUNTY OF MAUI
DEPARTMENT OF PLANNING

November 29, 2010

Ms. Katherine Puana Kealoha, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Kealoha:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE PULELEHUAKEA SUBDIVISION, A 13-LOT SINGLE-FAMILY RESIDENTIAL SUBDIVISION, TO BE LOCATED ALONG AINA LANI DRIVE, PUKALANI, ISLAND OF MAUI, HAWAII; TMK: (2) 2-5-006:019 (EA 2010/0005) (CPA 2010/0003) (CIZ 2010/0006)

The Department of Planning, on behalf of the Maui Planning Commission, has reviewed the DEA prepared in accordance with Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 11-200, Hawaii Administrative Rules (HAR), for the subject project and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish notice of availability for this project in the **December 23, 2010** Office of Environmental Quality Control (OEQC) Environmental Notice.

We have attached a completed OEQC Publication Form, one (1) hard copy of the DEA, and one (1) CD copy of the DEA in PDF format.

Thank you for your cooperation. Should you need further clarification, please contact Staff Planner Danny Dias at danny.dias@mauicounty.gov or at (808) 270-7557.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for KATHLEEN ROSS AOKI
Planning Director

Attachments
xc: Danny A. Dias, Staff Planner
Leilani Pulmano, Munekiyo & Hiraga, Inc.
EA Project File
Project File
General File
KRA:CIY:DAD:atn
K:\WP_DOCS\PLANNING\Cpa\2010\0003_Pulelehuakea Subdivision\OEQC_TransLtr.doc

Draft Environmental Assessment

PROPOSED PULELEHUAKEA RESIDENTIAL SUBDIVISION LOCATED AT PUKALANI, MAUI, HAWAII

TMK (2) 2-3-008:036 (por.)

Prepared for:

KG Maui Development, LLC

Revised December 2010
August 2010

MUNEKIYO & HIRAGA, INC.

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Executive Summary

Project Name:	Proposed Pulelehuakea Residential Subdivision
Type of Document:	Draft Environmental Assessment
Legal Authority:	Chapter 343, Hawaii Revised Statutes
Applicable Trigger:	Amendment to the Makawao-Pukalani-Kula Community Plan
Agency Determination:	Anticipated Finding of No Significant Impact
Location:	Maui Island Pukalani, Maui, Hawaii TMK No. (2) 2-3-008:036 (portion)
Applicant:	KG Maui Development, LLC 175 Paoakalani Avenue, Suite 300 Honolulu, Hawaii 96815 Contact: Elton Wong Phone: (808) 931-4365
Approving Authority:	Maui Planning Commission 250 South High Street Wailuku, Hawaii 96793 Contact: Kathleen Ross Aoki Phone: (808) 270-7735
Consultant:	Munekiyo & Hiraga, Inc. 305 High Street, Suite 104 Wailuku, Hawaii 96793 Contact: Leilani Pulmano Phone: (808) 244-2015
Project Summary:	KG Maui Development, LLC (KG) will be seeking a Community Plan Amendment (CPA) to the Makawao-Pukalani-Kula Community Plan's land use map, as well as a County Change in Zoning (CIZ) for land under its ownership in Pukalani, Maui, Hawaii. The principal component of the land use requests involves the CPA and CIZ to enable the development of the proposed 13-lot Pulelehuakea single-family residential subdivision.

Additionally, KG is filing CPA and CIZ applications to downzone existing residential zoned lands within the adjoining Pukalani Country Club Golf Course to be consistent with the underlying existing golf course use.

The amendment to the Makawao-Pukalani-Kula Community Plan triggers compliance with Hawaii Revised Statutes (HRS), Chapter 343 requirements. The Environmental Assessment (EA) will evaluate the technical characteristics, environmental impacts and alternatives, as well as advance findings relative to the significance of proposed project impacts. Upon completion, the EA will act as the primary supporting technical document for the consolidated CPA and CIZ applications. The Approving Agency for the EA is the Maui Planning Commission.

I. PROJECT OVERVIEW

I. PROJECT OVERVIEW

A. PROPERTY LOCATION, EXISTING USE, AND LAND OWNERSHIP

KG Maui Development, LLC (KG) is proposing to develop a residential subdivision and related improvements on approximately 6.0 acres of land (hereafter referred to as the "subdivision site") and to establish land use designation consistency on 8.4 acres of the Pukalani Country Club Golf Course (hereafter referred to as the "golf course site") of a 39.2-acre parcel at Tax Map Key (TMK) (2) 2-3-008:036 at Pukalani, Maui, Hawaii. The subdivision site is located between Holes 5, 6, and 7 and the golf course site is located within Holes 6 and 7 of the Pukalani Country Club Golf Course. Collectively, the two (2) sites are hereafter referred to as the "project area". See **Figure 1**.

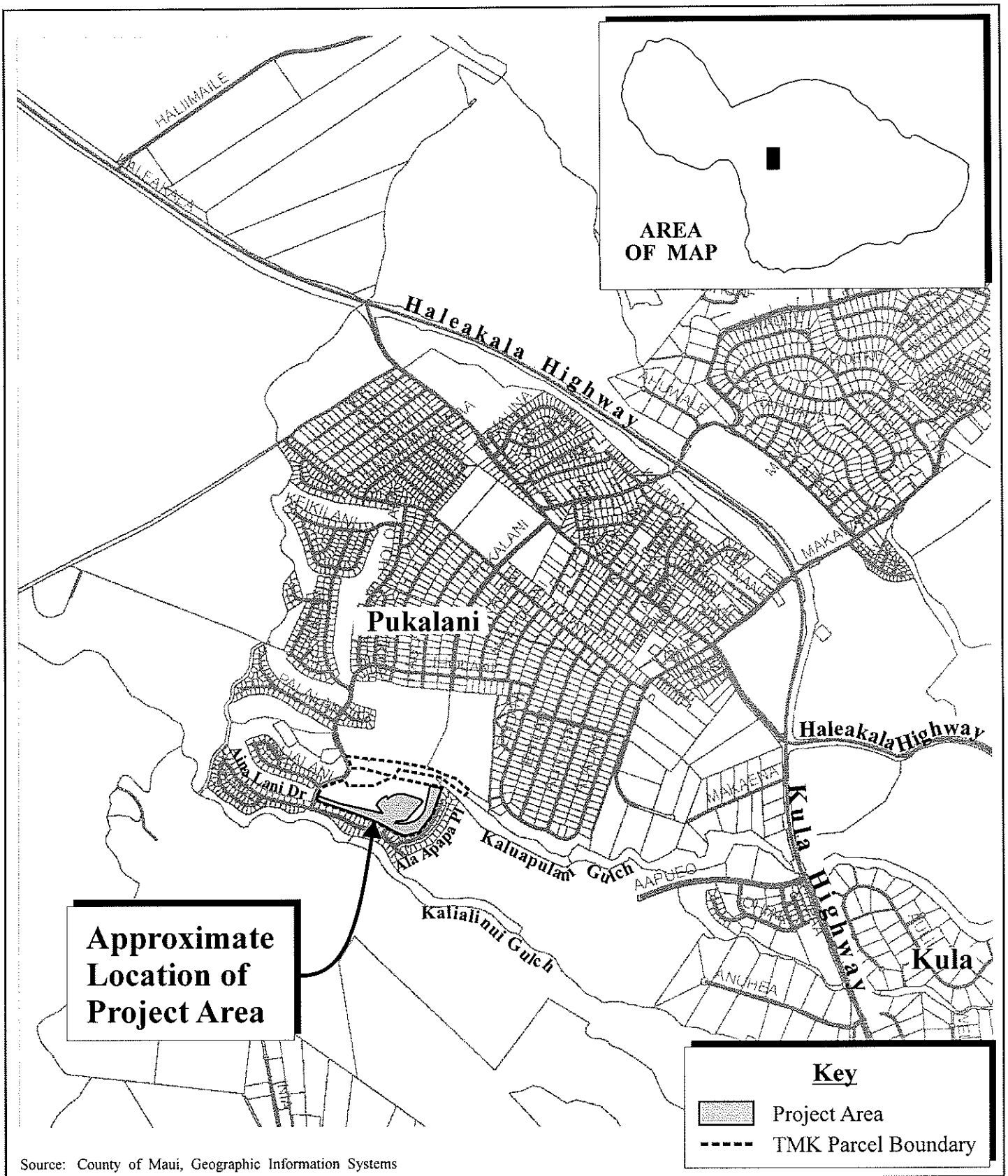
Currently, the subdivision site is vacant, undeveloped land; and the golf course site is within the existing Holes 6 and 7 of the Pukalani Country Club Golf Course.

The entire TMK parcel (2) 2-3-008:036, which includes the project area, is owned by KG.

B. PROPOSED ACTION

The principal component of the land use requests involves the development of the proposed Pulelehuakea Residential Subdivision. The proposed subdivision, identified as Area "A" in **Figure 2**, will provide 13 single-family residential lots ranging from 15,000 to 37,000 square feet. Related improvements will be completed as part of the project implementation, including site grading and grubbing, landscaping, relocation of a cart path, installation of utilities and drainage system, and construction of roadways and retaining walls.

The subdivision site is designated "Urban" for the State Land Use District; "SF, Single-Family Residential", and "PK (GC), Park (Golf Course)" for Makawao-Pukalani-Kula Community Plan; "D-1, Two-Family Duplex", "R-1, Residential", and "PK-4, Golf Course Park Districts" for Maui County Zoning. See **Figure 3** and **Figure 4**. To enable project implementation, Community Plan Amendment (CPA) and Change in Zoning (CIZ) applications will be initiated for the project site. The requested land use changes for the subdivision site are summarized in the **Table 1** below:



Source: County of Maui, Geographic Information Systems

Figure 1 Proposed Pulelehuakea Residential Subdivision

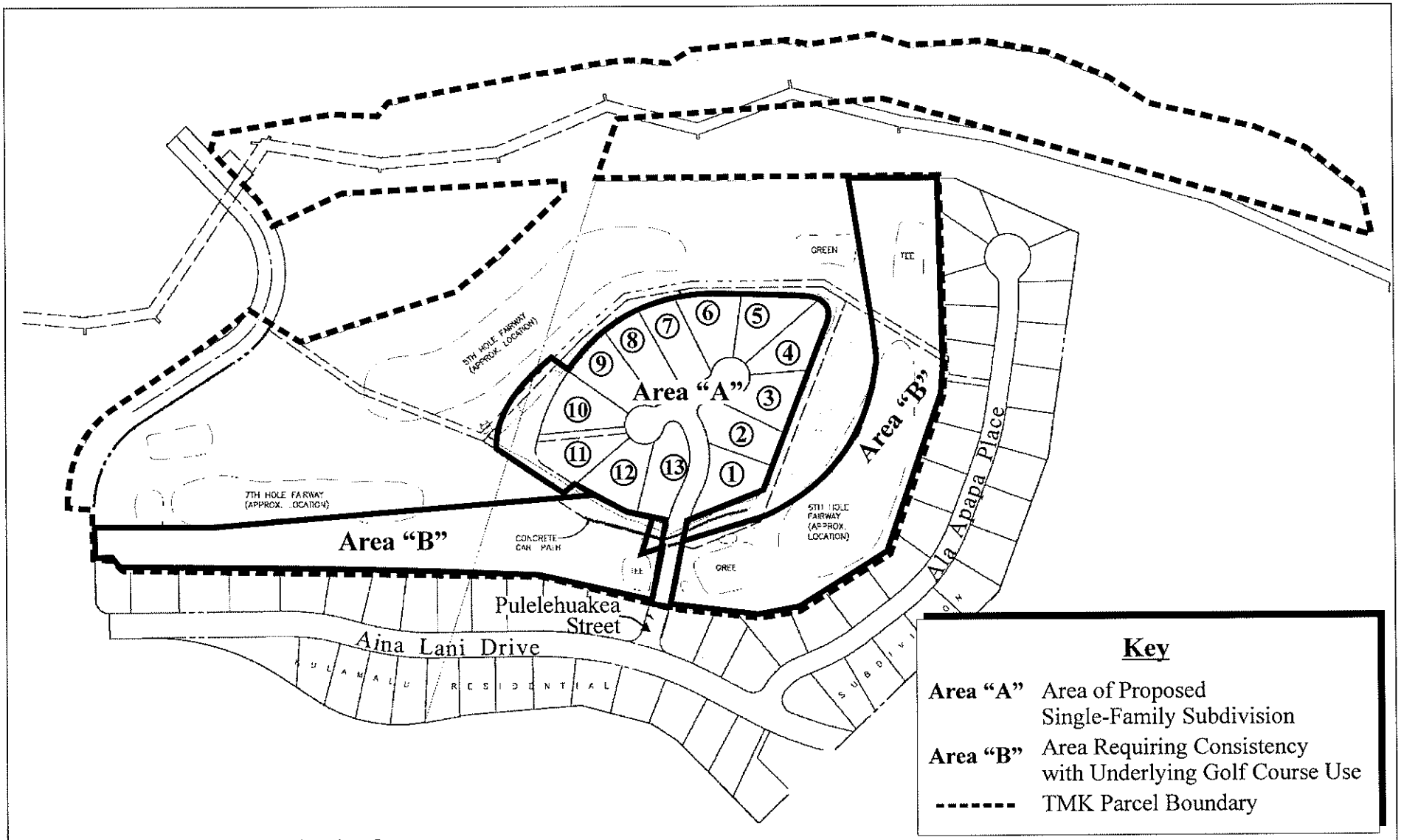
NOT TO SCALE

Regional Location Map

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani36\regionalDEA



Source: Ronald M. Fukumoto Engineering, Inc.

Figure 2

Proposed Pulelehuakea Residential Subdivision

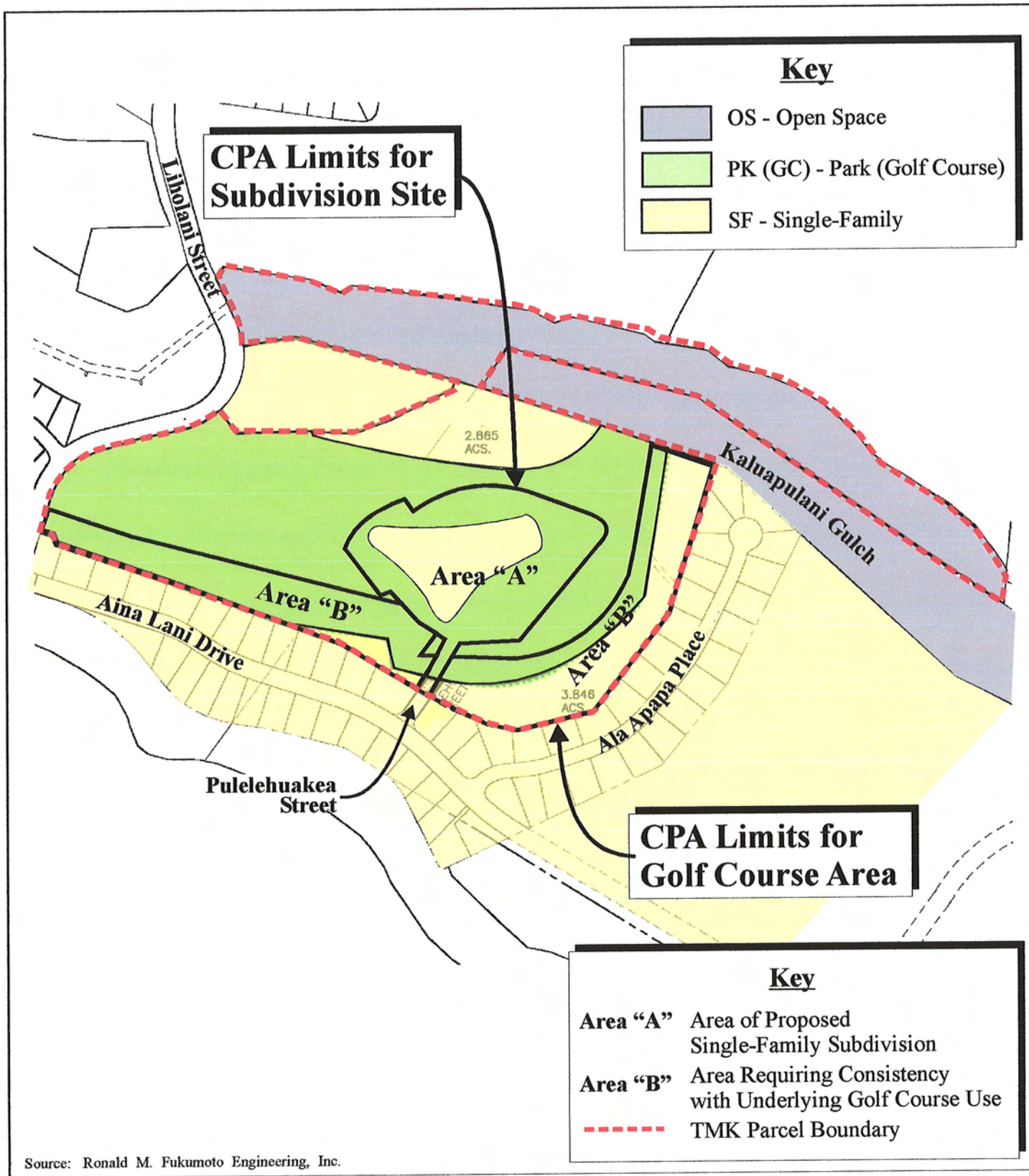
Preliminary Site Plan

NOT TO SCALE

MUNEKIYO & HIRAGA, INC.

Prepared for: KG Maui Development, LLC

KG Holdings/Pukalani36/siteplan



Source: Ronald M. Fukumoto Engineering, Inc.

Figure 3 Proposed Pulelehuakea Residential Subdivision

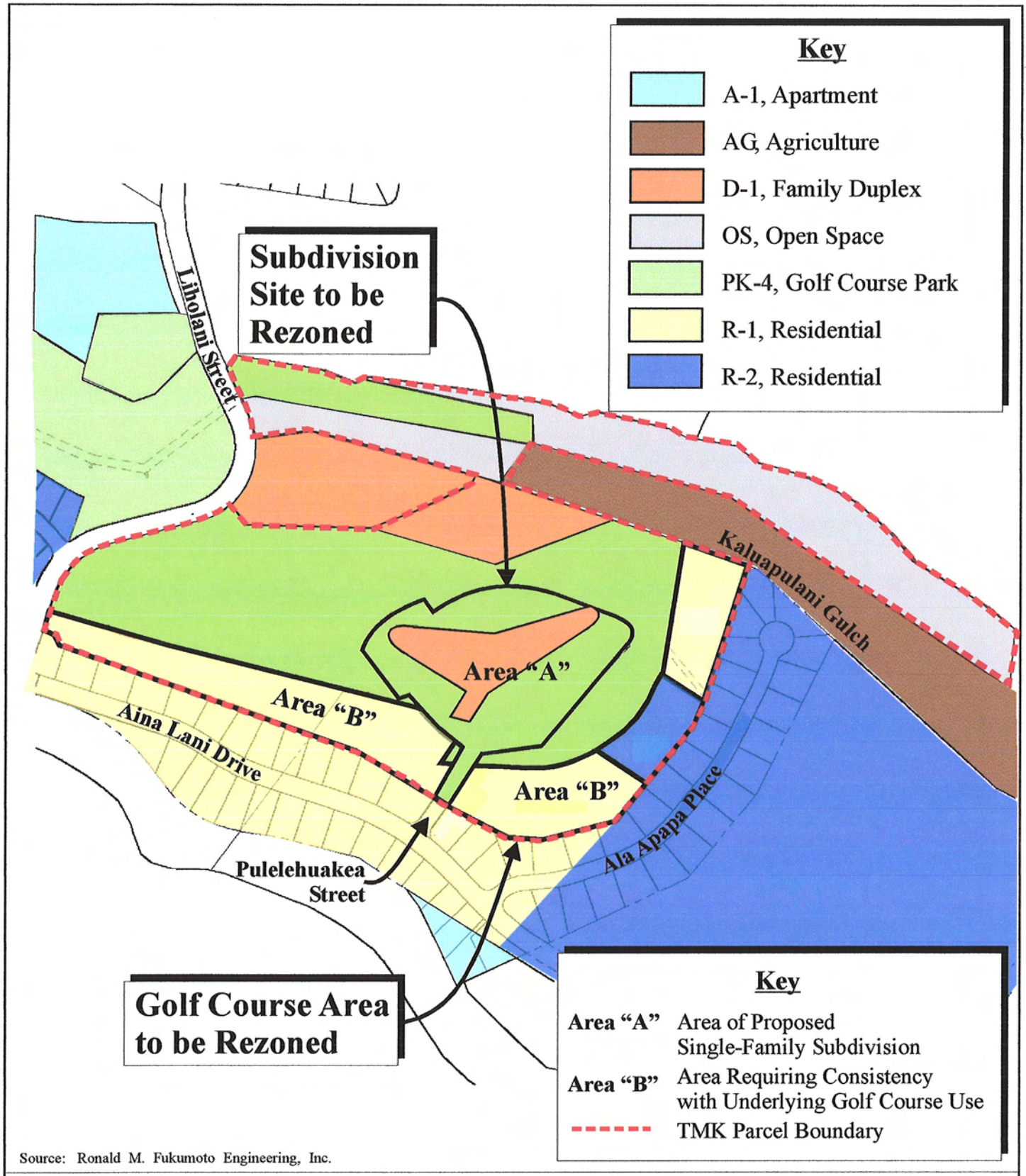
Existing Community Plan Map

NOT TO SCALE

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani36\communityplan



Source: Ronald M. Fukumoto Engineering, Inc.

Figure 4 Proposed Pulelehuakea Residential Subdivision

NOT TO SCALE

Existing Zoning Map

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani36\zoningdist

Table 1. Summary of Requested Land Use Changes for Area "A" Subdivision Site

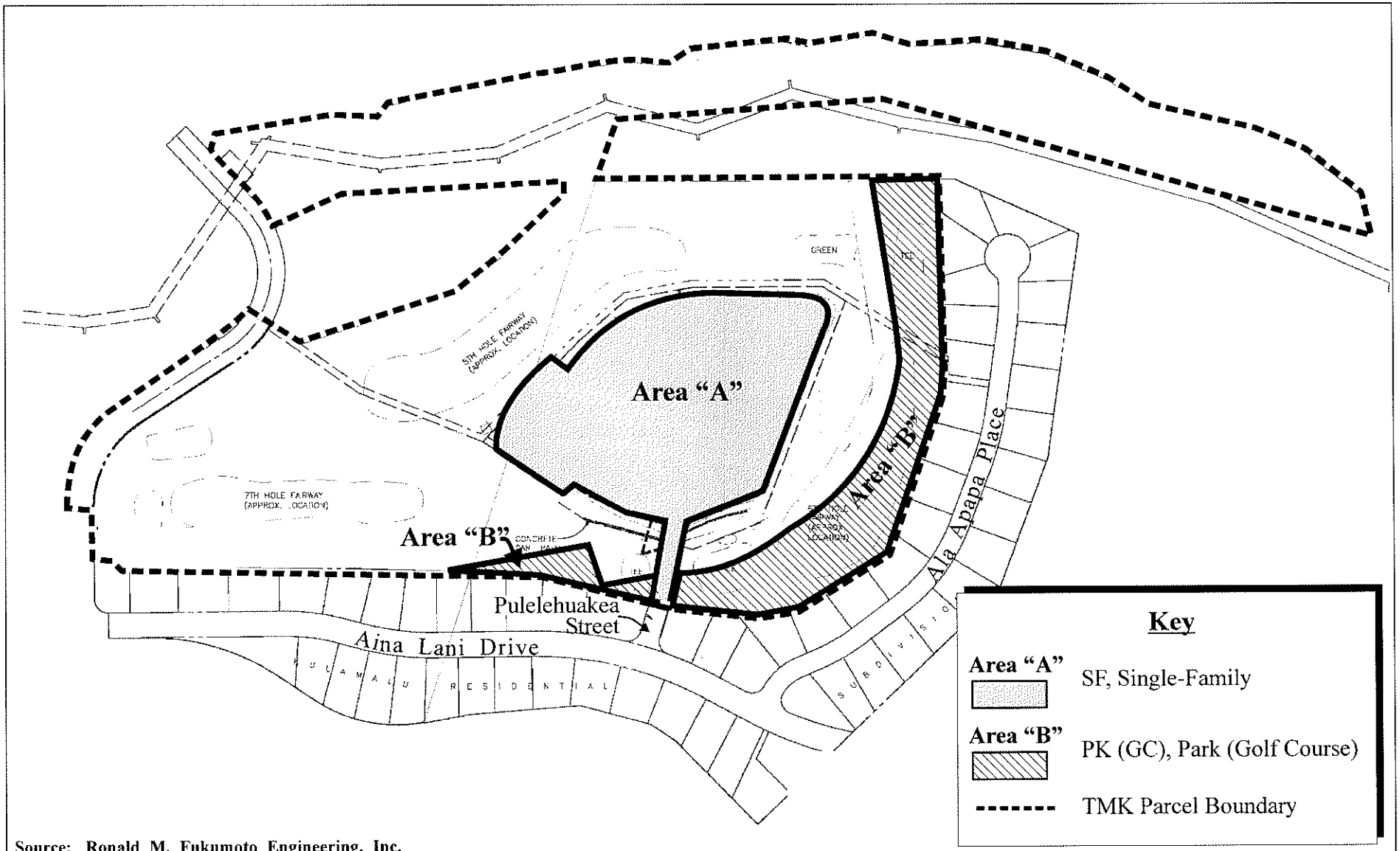
Land Use Designation	Existing	Requested Changes	Acres
State Land Use District	Urban	None	6.0
Makawao-Pukalani-Kula Community Plan	SF, Single-Family PK (GC), Park (Golf Course)	SF, Single Family	
Maui County Zoning	D-1, Two-Family Duplex R-1, Residential PK-4, Golf Course Park District	R-3, Residential	

Additionally, KG is requesting downzoning of existing residential land use designations within the adjacent Pukalani Country Club Golf Course to be consistent with the underlying existing golf course use. The additional CPA and CIZ actions will ensure long-term viability of the Pukalani Country Club Golf Course by establishing land use designation consistency. Approximately 8.4 acres of Hole 6 and Hole 7 (behind homes on Aina Lani Drive and Ala Apapa Place) are currently zoned as "R-1, Residential" and "R-2, Residential" by Maui County. This golf course site is referenced as Area "B" in **Figure 2**, while a portion, approximately 3.8 acres, of Area B is designated "SF, Single-Family Residential" for the Makawao-Pukalani-Kula Community Plan. No improvements are proposed at the golf course site as part of this action. See **Figure 5** and **Figure 6**. **Table 2** below summarizes the golf course land use changes:

Table 2. Summary of Requested Land Use Changes for Area "B" Golf Course Site

Land Use Designation	Existing	Requested Changes	Acres
State Land Use District	Urban	None	0.0
Makawao-Pukalani-Kula Community Plan	SF, Single Family	PK (GC), Park (Golf Course)	3.8
Maui County Zoning	R-1, Residential R-2, Residential	PK-4, Golf Course Park District	8.4

To summarize, the applicant is seeking to amend the Community Plan to establish a "SF, Single-Family" designation while concurrently seeking a County Change in Zoning to establish the "R-3, Residential" zoning for the subdivision site. Additionally, the golf course site will be downzoned to ensure long-term viability of the Pukalani Country Club Golf Course. Refer to **Figures 3** to **6.**



Source: Ronald M. Fukumoto Engineering, Inc.

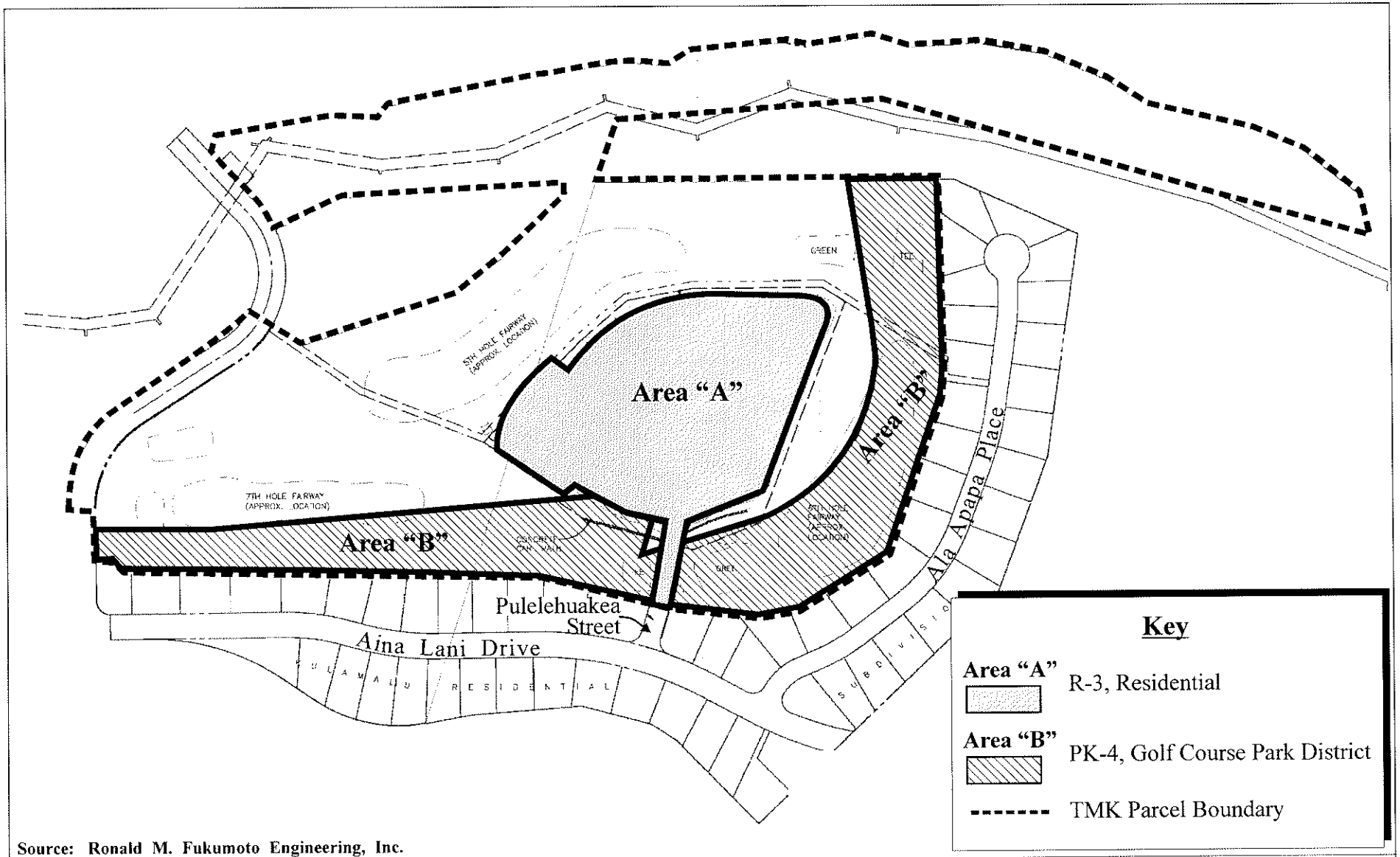
Figure 5 Proposed Pulelehuakea Residential Subdivision

Proposed Community Plan Amendment Area

NOT TO SCALE

MUNEKIYO & HIRAGA, INC.

Prepared for: KG Maui Development, LLC



Source: Ronald M. Fukumoto Engineering, Inc.

Figure 6 Proposed Pulelehuakea Residential Subdivision

Proposed Change in Zoning Area

NOT TO SCALE

MUNEKIYO & HIRAGA, INC.

Prepared for: KG Maui Development, LLC

KG Holdings/Pukalani36/siteplanCIZappl

C. PROJECT NEED

According to the Socio-Economic Forecast for the General Plan 2030, population on Maui Island is estimated to increase by approximately 44 percent, with the Makawao-Pukalani-Kula region estimated to increase by approximately 63 percent (Socio-Economic Forecast, June 2006). This increase in population will create a demand for 824 additional housing units in the Makawao-Pukalani-Kula region. The proposed subdivision site will increase the supply of available housing for Upcountry residents to help meet this future demand. The proposed subdivision site will provide opportunities for market-priced, trade-up housing which is consistent with the surrounding neighborhoods.

D. REGULATORY CONTEXT AND CHAPTER 343, HAWAII REVISED STATUTES

The amendment to the Makawao-Pukalani-Kula Community Plan triggers compliance with Hawaii Revised Statutes (HRS), Chapter 343 requirements. As such, the processing of an Environmental Assessment (EA) pursuant to Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 200 of Title 11, Department of Health Administrative Rules, Environmental Impact Statement Rules will be required. Therefore, this EA will address technical characteristics, environmental impacts and alternatives, as well as advance findings relative to the significance of proposed project impacts. This EA will act as the primary supporting technical document for the County's consolidated CPA and CIZ applications. The Approving Agency for the EA is the Maui Planning Commission. The applications will be reviewed by the Maui Planning Commission, which will provide recommendations to the Maui County Council for review and final action.

E. PROJECT IMPLEMENTATION CONSIDERATIONS AND PROJECT SCHEDULE

As mentioned previously, the proposed Pulelehuakea Residential Subdivision will provide 13 single-family lots. The construction of the single-family homes will commence upon receipt of all land entitlements, regulatory permits, and approvals. It is estimated that the entitlements process will take approximately two (2) years to complete, followed by approximately one (1) year for subdivision approval and building permit receipt. Site construction of the subdivision is estimated to commence in 2013 and be completed by 2015.

The golf course site will remain as is. There will be no construction as part of the CPA and CIZ requests to downzone this area in order to establish land use designation consistency on the golf course.

F. LONG-TERM MANAGEMENT

Lot owners and homeowners of the proposed project will be subject to covenants, conditions, and restrictions (CC&Rs) that will provide the framework for long-term management of the subdivision. The CC&Rs will be modeled after the existing CC&Rs for the Kulamalu Homeowners Association to ensure consistency with the surrounding neighborhood. A homeowners association will be formed to administer and enforce the CC&Rs.

G. SUSTAINABLE FEATURES

The proposed subdivision site is proposing a number of sustainable design features as part of the site construction and future home design to reduce green house gas emissions, provide for renewable energy, and reduction of waste. Sustainable features in site construction include Best Management Practices (BMPs) and erosion control plans to reduce pollution from construction activities by controlling soil erosion, sedimentation, and airbourne dust generation. This will include measures, such as dust fencing and drainage swales. Treatment will be through the on-site retention/detention basin.

The site construction company will be required to provide a construction waste management plan with the intent to reduce construction waste prior to site construction.

Outdoor lighting systems will be designed to minimize the light trespass from the site and reduce the development impact on nocturnal environments. This will enhance the opportunities to view the starry night skies.

The proposed subdivision site will also include water conservation measures by employing high efficiency water fixtures throughout the common areas. Landscape features will be designed to avoid invasive plant species and minimize the demand for water and synthetic chemicals through native and drought tolerate plant selection, mulching, and soil amendments.

Indoor demand for water will also be reduced through design requirements. High efficiency fixtures, including low flow faucets and showerheads will be incorporated as design requirements into the CC&Rs.

In addition, other sustainable features for housing design elements within the CC&Rs will include requirements for reducing energy needs such as Energy Star appliances. And, all homes will be required to provide solar water heaters. These measures, taken together, will help to reduce green house gas emissions, provide for renewable energy, and reduction of waste.

II. EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

II. EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Uses

a. Existing Conditions

The project area, which comprises of the subdivision site and golf course site (herein referred to as the "project area"), is located in the Pukalani region, a suburban area on the western slopes of Haleakala. The Pukalani area is predominantly residential, with a mixture of commercial, rural and agricultural uses.

The subdivision site is surrounded by Holes 5, 6, and 7 of the Pukalani Country Club Golf Course. Adjacent to the golf course is the Kulamalu Residential Subdivision and Liholani Golf Villas with the Kaluapulani Gulch bordering the larger TMK parcel. Further south is the Kalialinui Gulch. The golf course site is within Holes 6 and 7 of the Pukalani Country Club Golf Course.

Beyond the immediate project areas, less than a mile to the north, is the Pukalani Town Center, a shopping center and office complex, and the Mayor Hannibal Tavares Community Center.

b. Potential Impacts and Mitigation Measures

The proposed land use changes will be compatible with surrounding residential uses within the immediate area. The surrounding area can be characterized as a golf course residential community and the proposed project is fitting with this characterization. Therefore, the proposed Pulelehuakea Residential Subdivision will be compatible with existing surrounding uses.

Furthermore, no changes will occur as part of this application on the golf course site. The action for this area is to keep the golf course use consistent with the underling land use designations.

2. Climate, Topography, and Soil Characteristics

a. Existing Conditions

The Pukalani area is generally cool and equable year round. Average annual rainfall ranges between 40 and 50 inches per year, with most rainfall occurring between the months of October and April. Average temperature ranges from low 70 degrees Fahrenheit in the cooler months to high 70 degrees Fahrenheit in the warmer months (Maui County Data Book, 2008).

Like most areas of the island, northeasterly tradewinds prevail and are more persistent during summer than winter.

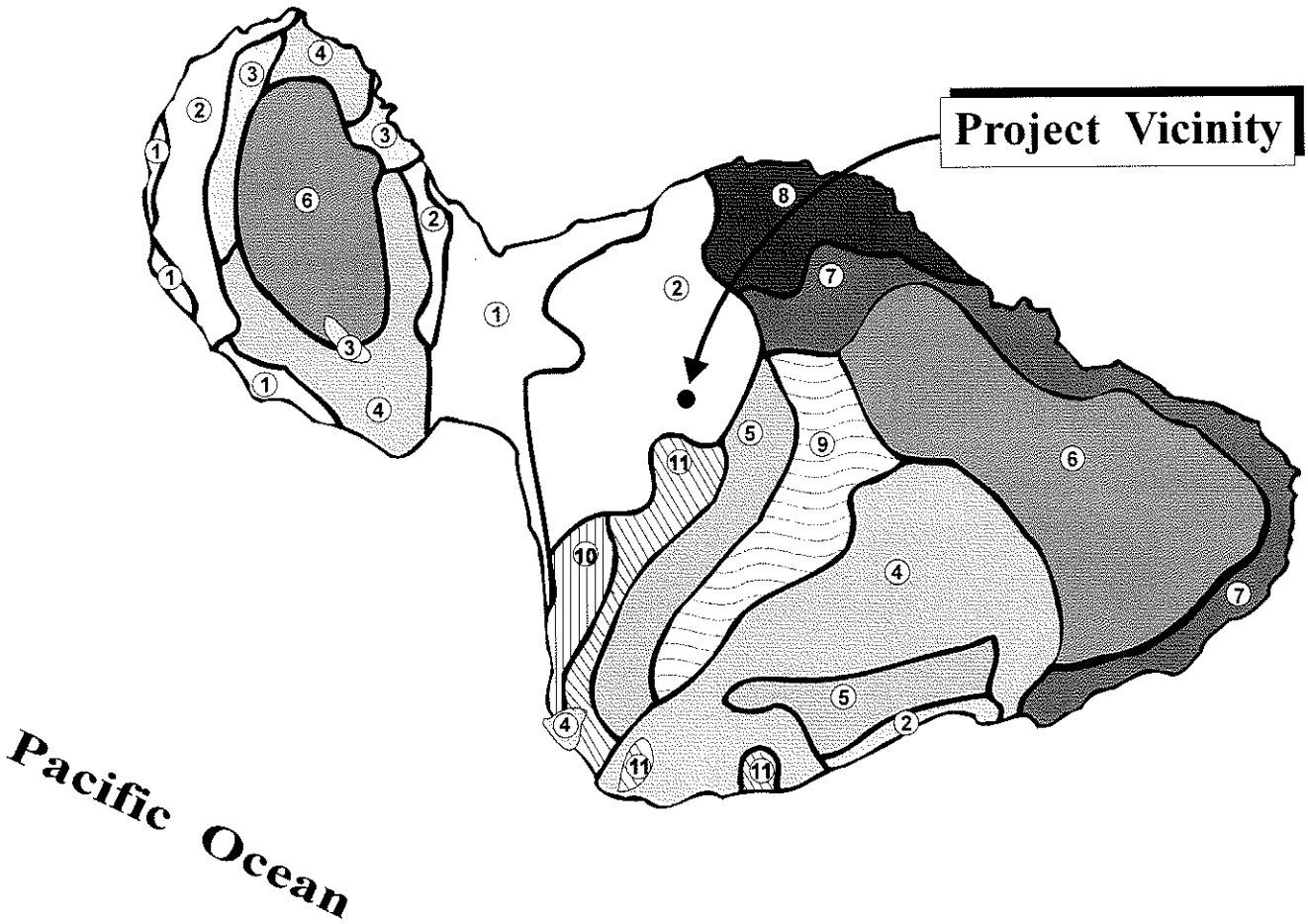
The elevations of the project site range from approximately 1,220 feet to 1,274 feet above mean sea level. The project site generally slopes down from southeast to northwest. The slopes range from 6 to 12 percent throughout the site. See **Appendix "A"**.

Underlying the project site is soils belonging to the Waiakoa-Keahua-Molokai association. See **Figure 7**. This soil association is found on low uplands and consists of moderately steep, well-drained soils that have a moderately fine textured subsoil.

The specific soils consist of Keahua Silty Series: Keahua Silty Clay (KncC) and Keahua Silty Clay Loam (KnB). See **Figure 8**. These well drained soils are generally utilized for pineapple, pasture, and homesites. KncC, with 7 to 15 percent slope, has a dark reddish-brown surface layer of silty clay loam that is about 10 inches thick, moderate permeability, slow to medium runoff, and slight to moderate erosion hazard. While KnB is similar in most characteristics with the differences being 50 inches thick, runoff is slow, and the erosion hazard is slight.

LEGEND

- (1) Pulehu-Ewa-Jaucas association
- (2) Waiakoa-Keahua-Molokai association
- (3) Honolua-Olelo association
- (4) Rock land-Rough mountainous land association
- (5) Puu Pa-Kula-Pane association
- (6) Hydrandepts-Tropaquods association
- (7) Hana-Makaalae-Kailua association
- (8) Pauwela-Haiku association
- (9) Laumaia-Kaipoipoi-Olinda association
- (10) Keawakapu-Makena association
- (11) Kamaole-Oanapuka association



Source: USDA Soil Conservation Service

Figure 7 Proposed Pulelehuakea Residential Subdivision

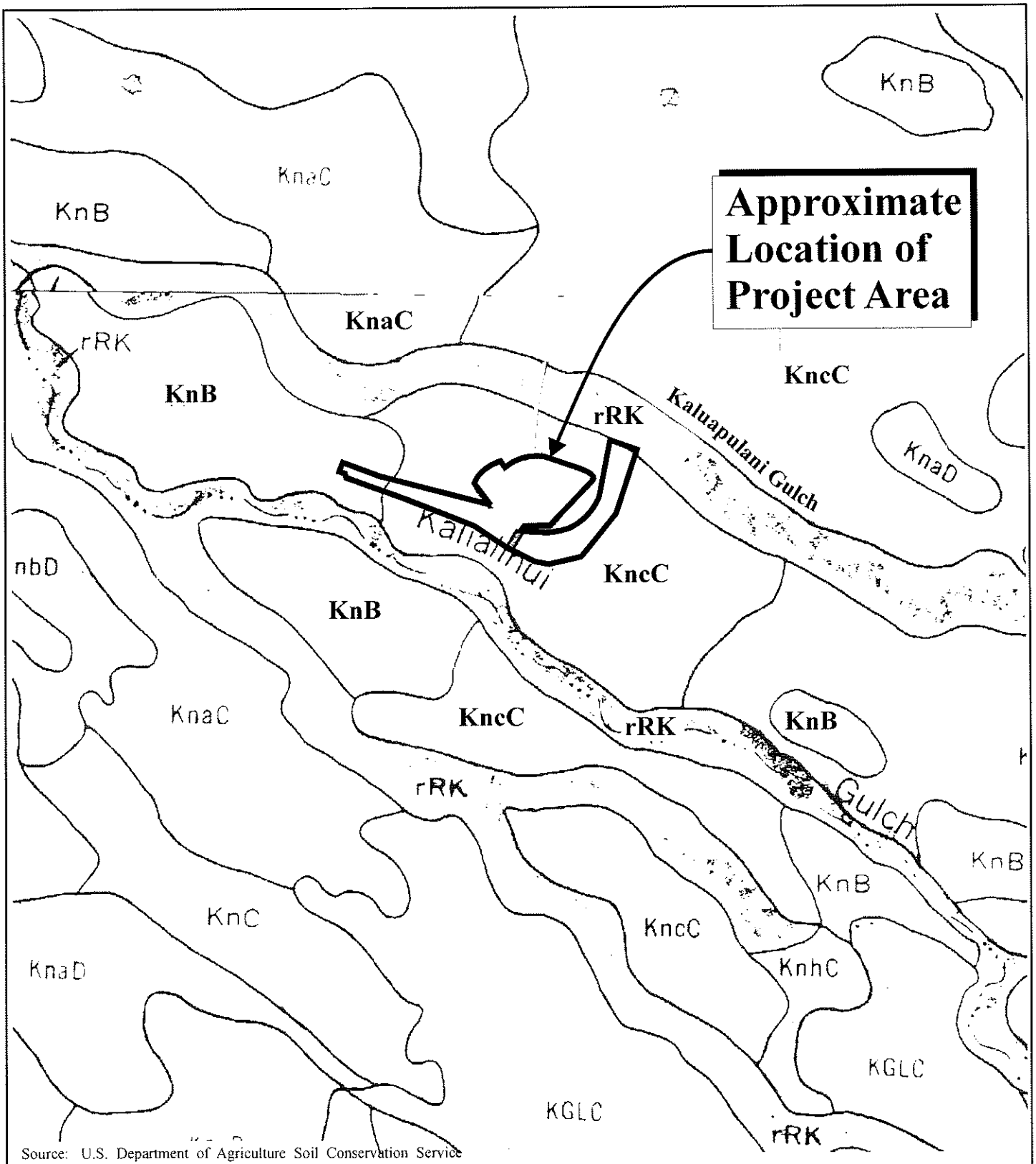
Soil Association Map

NOT TO SCALE

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani36\SOILS



Source: U.S. Department of Agriculture Soil Conservation Service

Figure 8 Proposed Pulelehuakea Residential Subdivision

Soils Classification Map

NOT TO SCALE

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani36\soilsclass

b. Potential Impacts and Mitigation Measures

The proposed project is not anticipated to have any substantial adverse impact on climate, topography, or soil conditions. Project implementation of 13 residential lots are not anticipated to significantly impact the climate patterns in the Pukalani region.

Relative to topography, the applicant intends to utilize the existing slope to site the future homes to provide view planes. In that regard, the goal will be to balance the cut and fill of the sitework for the proposed subdivision to minimize topographic impacts.

The characteristics of soils in the subdivision site will not deter project implementation, as the soils are acceptable for homesites.

In regards to the golf course site, no changes will occur as part of the downzoning.

3. Flood and Tsunami Hazard

a. Existing Conditions

Federal Emergency Management Agency's Flood Insurance Rate Maps for the proposed project area is Zone X, which indicates an area of minimal flooding. Furthermore, the property is located upland, away from tsunami inundation areas.

b. Potential Impacts and Mitigation Measures

The proposed subdivision nor the existing use of the golf site will pose a flood hazard. Drainage improvements are proposed for the subdivision site to ensure surrounding properties are not impacted by the proposed subdivision. Furthermore, the project area is located upland, and there are no threats to the surrounding areas from coastal wave action as it is significantly outside of the tsunami inundation areas.

4. Flora and Fauna

a. Existing Conditions

A Flora and Fauna Study was conducted in May 2010 by Robert Hobdy. See **Appendix "B"**. A walk-through flora survey was completed for the proposed project.

Relative to the biological history, this area once had dry land vegetation consisting of *wiliwili* (*Erythrina sandwicensis*), *aalii* (*Dodonaea viscose*), *akia* (*Wikstroemia monticola*), and a mixture of other grasses and shrubs. During the 1900's the gentler slopes were farmed with pineapple and cattle grazing was wide spread. These land uses gradually destroyed most of the native species which were replaced by agricultural crops and weeds or by hardy pasture grasses. Today, little remains of the native plants on the ridgetops and the area is dominated by non-native species.

The existing vegetation on the proposed subdivision area consisted of dry grassland with shrubs and few scattered trees. The most abundant specie was Guinea grass (*Panicum maximum*) which was found throughout the area. Also common were *koa haole* (*Leucaena leucocephala*) and buffelgrass (*Cenchrus ciliaris*).

A total of 57 plant species were recorded during the survey. Of these 57 plant species, five (5) were native species including the *wiliwili* (*Waltheria indica*) and *koali awahia* (*Ipomoea indica*) which are native to Hawaii, as well as to many other Pacific islands. One (1) specie, the *niu* or coconut, was a Polynesian introduction to Hawaii. The remaining species were non-native agricultural weeds, pasture plants, or ornamentals. Refer to **Appendix "B"** for a list of plant species.

A fauna survey was also conducted in conjunction with the flora survey. One (1) mammal specie-Axis deer (*Axis* axis)-was observed during the two (2) site visits. Axis deer are normally found in pasture lands and in gulches in and around the Pukalani region. Other mammals that would be expected to be found in this area would be mice (*Mus domesticus*), rats (*Rattus spp.*), mongoose (*Herpestes auropunctatus*), and cats (*Felis catus*).

A special effort was made to look for the endangered Hawaiian hoary bat by making an evening survey of the property. No evidence of such activity was observed though visibility was excellent. Besides visual observation method, an electronic bat detecting device was used to locate the bat; however, no bat activity was detected.

There were moderate birdlife observed in both diversity and numbers for the subdivision area. Ten (10) species of non-native birds were observed, including the common myna, house finch, and northern cardinal. Refer to **Appendix "B"** for a list of bird species. The habitat is not suitable for Hawaii's native forest birds that are normally present at higher elevations. The habitat is also too close to human activities for the *pueo* or Hawaiian owl (*Asio flammeus sandwichensis*) which prefers expanses of open country.

While insects in general were not surveyed, a special examination for the native Blackburn's sphinx moth (*Manduca blackburni*) or their larvae was conducted as this moth has been put on the Federal Endangered Species list. There was no evidence of the moth, their larvae or habitat in the area.

b. Potential Impacts and Mitigation Measures

There were no rare, threatened, or endangered species of flora or fauna on the proposed project area. In regards to the golf course site, no work is proposed as part of the downzoning which would impact the existing conditions of flora and fauna resources. Accordingly, the proposed action is not anticipated to have an adverse impact on the flora and fauna resources.

5. Streams and Wetlands

a. Existing Conditions

There are no wetlands, streams, gulches, or other water bodies on the project area. However, there is a gulch nearby the project site named Kaluapulani Gulch to the north. Kaluapulani Gulch is not listed as a perennial stream in Hawaii Stream Assessment (1990) study.

b. Potential Impacts and Mitigation Measures

The proposed subdivision's runoff will be accommodated onsite and will not be conveyed to Kaluapulani Gulch. In regards to the golf course site, no changes will occur as part of this action. Therefore, the proposed project is not anticipated to have a significant adverse impact to streams, wetlands, gulches, and other water bodies.

6. Archaeological Resources

a. Existing Conditions

An Archaeological Assessment was completed for the subdivision site by Scientific Consultant Services, Inc. in December, 2009. See **Appendix "C"**. The purpose of the assessment was to determine the presence or absence of midden deposits, and artifact deposits on the surface of the project area, as well as assess the potential for the presence of subsurface cultural deposits. If sites/historic properties were identified, they were to be evaluated in terms of significance criteria.

As part of the Archaeological Assessment, a discussion of the environmental setting and historical background, a review of archival resources and the results of previous archaeological work conducted in the area were undertaken prior to fieldwork to assess expectations for the project area. Although pre-Contact sites do exist in the area, given the background history of the area as well as present land use, the expectations for finding post-Contact sites were greater than expectations for finding pre-Contact sites. Historic sites (i.e., roads, irrigation features, fences, house sites, etc.) associated with commercial agricultural activities were anticipated; with a very slight chance of encountering agricultural features including terraces, garden/animal enclosures, walls, and mounds. In summary, the estimated probability of documenting historic sites was low; the estimated probability of documenting pre-Contact sites was almost nonexistent.

A full systematic pedestrian survey, providing 100 percent coverage of the subdivision site was conducted and three (3) stratigraphic trenches were excavated. The archaeological survey found no surface or subsurface archaeological or cultural artifacts on the subdivision site.

An archaeological survey was not conducted for the golf course site as no changes will occur as part of the downsizing action.

b. Potential Impacts and Mitigation

Since the Archaeological Assessment conducted for the proposed Pulelehuakea Residential Subdivision site did not identify any archaeological sites or cultural artifacts, there is a low likelihood of adversely impacting archaeological or cultural resources. The State Historic Preservation Division (SHPD) has reviewed and approved the archaeological survey, as documented in **Appendix "C-1"**. Furthermore, the existing golf course will not be affected as no changes will occur as part of this action. In the event cultural deposits or human burials are encountered during future construction activity, work will cease in the area of the find and the SHPD and Office of Hawaiian Affairs (OHA) will be contacted to establish appropriate mitigation measures in accordance with Chapter 6E, Hawaii Revised Statutes.

7. Cultural Resources

a. Existing Conditions

A Cultural Impact Assessment was prepared for the applicant by CKM Cultural Resources for the proposed project area. See **Appendix "D"**.

As noted in the assessment, the project site is situated within the *ahupuaa* of Kula and is located in the *ili* of *Aapueo*. Situated on a high, elevated plain within the *ahupuaa*, the *ili* is nestled along ridges and bordered by gulches that would have protected this area and made it a safe place to live. The assessment notes that there are various translations for *Aapueo*. One translation is "the owl's will", while another reflects the *aa* rock topography of the area. Most sources, however, believe that *Aapueo* was named after a female deity who once resided in the area.

The vegetation in the Kula and *Aapueo* areas do not flourish as generously as in other *ahupuaa* on Maui. Due to the arid conditions in Kula, *kalo* or taro was not a suitable plant crop. To supplement the need for wetland *kalo*, the *uala* (sweet potato) was grown as an alternative. Sweet potato was just as stable and healthy as *kalo* and required less water to bear fruit, while *kalo*

grew best in fields of fresh running water. The *ulu* (*artocarpus incisus*) or breadfruit was also cultivated as a dietary supplement for *kalo*. Another plant found in the Kula area is the *aalii* (*dodonaea*) bush. This hardwood native shrub is indigenous to the islands and grows well in dryer climates. The *aalii* is found at elevations of up to 8,000 feet and in wind-swept, open country. It can also be found in the gulches and area surrounding the project site. One important plant used to construct thatched homes was *Pili* grass (*heterogon contortus*), which used to grow in arid and dusty conditions. The native Hawaiians would group dried clumps of *Pili* grass together to form a waterproof dwelling.

The Cultural Impact Assessment indicates that there is little recorded information about wildlife in the Kula and *Aapueo* areas. It is noted, however, that foreign plants, feral animals, and fowl have invaded these areas and resulted in the destruction of much of the area's natural habitat. As indicated in the assessment, the native owl seldom takes flight in the area. The common barn owl (native to North America), which tends to be more aggressive and has caused a depletion of other native bird and plant species, primarily inhabits the region.

As noted in the Cultural Impact Assessment, the word *Kula* translates to "plain" in the Hawaiian language. While this may not fully describe the topography within this *ahupuaa*, much of its landscape is arid and farming was limited to plant crops that could tolerate hot days and cold evenings. Although the landscape in Kula has changed considerably over the past few centuries, the climate has remained constant. The assessment also notes that many of the culturally significant sites, such as *heiau* and *ahu*, no longer exist due to the "paniolo" (Hawaiian cowboy) age. During this era, much of the land was cleared for cattle ranching activities and *heiau* and *ahu* were plundered without regard for their significance to the area. Later, during the late 1950s and 1960s, population growth in the Kula region further affected data recovery and contributed to the lack of information on culturally significant sites.

To obtain a range of cultural perspectives, interviews were held with several individuals with knowledge and familiarity with the project area. A summary of three (3) of the four (4) interviews follows.

(1) Frances Lamadora

Ms. Lamadora stated that she was born in Haliimaile, and when she was a teenager, her family moved to Pukalani. Her home is across the gulch (Makawao area) of the project site. She related that when she was growing up in the area, they used to walk through the gulches, and through the project area. They used to see all kinds of "Hawaiian things" in the gulch, but always remembered what her parents taught them. They were not to touch things, or to be "*niele*" (curious) when they saw anything that belonged to the ancient culture of Hawai'i.

She recalls that her "Tutu" (grandparent) used to tell that the real name for the area that they lived in was Makaeha. Her grandmother used to scold her because they tried to shoot the owls that flew in the area with a slingshot. Her grandmother told her the owl was their *Aumakua* (family god), so she should not harm the owl.

She remembers that there was a *Heiau* (Hawaiian temple) above her home, but she was always told by her parents to stay away from the "stone pile". She does not remember anything about the area being studied, except for the high grass that was growing in the area of the project.

(2) Hokulani Holt-Padilla

Ms. Holt-Padilla related that she is aware of the project area, and is familiar with the past cultural history of the area. She did not know of any archaeological sites within the study area. However, she is aware of the gulches and ancient *Heiau* in other areas surrounding the project site.

(3) Charles Maxwell

Mr. Maxwell was born in Lahaina, Maui in 1937. Three years later, Mr. Maxwell and his family moved to Kula where he grew up and was raised. From birth until kindergarten, Mr. Maxwell spoke only Hawaiian since that was the only language his parents spoke at home. Through public schooling, Mr. Maxwell learned the English language.

Insofar as the project area is concerned, Mr. Maxwell mentioned that Aapueo Parkway was named after the female owl-goddess who lived in the area. Mr. Maxwell wrote a chant about *Aapueo* which was performed during one of the annual Merrie Monarch Festivals in Hilo. In pre-contact times, Mr. Maxwell mentioned that lands in the project area served as the site for the observance of the *Makahiki*, an annual

event held during the months of January and February at which time taxes were collected and festivities were held. Mr. Maxwell also mentioned that gulches in the area once contained adze factories and that evidence suggests that streams flowed within these gulches at one time.

During post-contact times, Mr. Maxwell indicated that the land mauka of the project site (across Kula Highway) was known for having the best sweet potato patches on the island. The sweet potatoes were planted to supply prospectors with food during the California gold rush. Later, with the advent of cattle ranching, Mr. Maxwell mentioned that the indigenous plants and trees in the area were wiped out and the forest line moved higher up the slopes of Haleakala. Without the forests to capture rain clouds and facilitate precipitation, stream flows in the gulches ceased.

In terms of cultural resources, Mr. Maxwell indicated that he is not aware of, nor has he observed, any cultural, gathering, or subsistence practices occurring on lands within the project area. In light of the foregoing, it was noted that the proposed project is not expected to have an adverse impact on native Hawaiian cultural resources, practices, and beliefs.

In summary, and as indicated by the Cultural Impact Assessment, there were no evidence of cultural practices in the project area.

b. Potential Impacts and Mitigation Measures

Based on findings of the Cultural Impact Assessment report and accounts presented by the four (4) interviewees, the proposed action is not anticipated to have an adverse effect on cultural resources, practices, or beliefs since cultural practices are not known to occur within the project area.

8. Air and Noise Quality

a. Existing Conditions

There are no point sources of airborne emissions in the immediate vicinity of the project area. The air in the Upcountry area is of good quality, with existing airborne pollutants attributable primarily to automobile exhaust from the region's roadways and the occasional harvesting (burning) of sugar cane fields. However, the prevailing tradewinds disperse these pollutants.

Noise generated in the vicinity of the subject property may be attributed to natural conditions (i.e. wind), vehicles traversing nearby neighbor roadways, such as Aina Lani Drive and Liholani Street, and golf-related activity involving the maintenance of the golf operations.

b. Potential Impacts and Mitigation Measures

Given the nature of the proposed action, involving development of 13 single-family lots and downzoning of the golf course site, there should be no adverse impacts on air quality or noise conditions. Airborne particulates, including dust, may be generated during site preparation and construction. To minimize dust generation, appropriate construction Best Management Practices (BMPs) will be utilized, such as but not limited to installation of dust fencing and watering of graded areas.

Ambient noise conditions will be temporarily affected by construction activities. Material-transport vehicles and power tools are anticipated to be the dominant source of noise generation during construction. As with air emissions, construction noise will be minimized through use of applicable BMPs. Construction will be limited to daylight work hours and coordination with surrounding neighbors will be undertaken to establish an effective communication protocol.

No physical improvements are proposed for the golf course site as part of the downzoning action.

The proposed action is not anticipated to have adverse impacts on air or noise quality in the vicinity.

9. Scenic and Open Space Resources

a. Existing Conditions

The project area is not located within a scenic view corridor. Central Maui isthmus, West Maui mountains, South Maui region, and northern and southern shorelines are visible from the project site. Haleakala is also visible from the project area.

Upcountry is rural in nature and open space is characteristic of this area. The project area will be developed on currently vacant lands, although the Makawao-Pukalani-Kula Community Plan and County zoning provide for residential uses on a portion of the proposed subdivision site.

b. Potential Impacts and Mitigation Measures

Given the scope of the proposed action, there should be no adverse effect on scenic and open space resources in the area. As previously stated, the project area does not lie within a scenic view corridor. The single-family homes are limited to 30 feet in building height so as not to affect view planes from surrounding neighbors' vantage points. A view analysis study was conducted with the Kulamalu Homeowners Association Subcommittee for the proposed subdivision site. The view analysis consisted of setting a cherry picker bucket at the height of 30 feet and conducting a pedestrian site survey from the neighboring homes with the Kulamalu Subdivision Homeowners Subcommittee. Some neighbors will see the future homes; however, the view planes will not block the views of the ocean horizon. The Kulamalu Subdivision neighbors will be able to see the ocean over the top of the proposed subdivision homes. Additionally, the existing pine trees surrounding the subdivision site is thick and will likely block the views of the future homes from some of the Kulamalu Subdivision neighbors.

The Liholani Golf Villa neighbors will see the future homes of the proposed subdivision, although the views of Haleakala will not be impacted as the mauka view planes will still be visible. However, as a further mitigative measure for view planes, Lots 1 and 2 will be restricted to 25 feet for building heights.

Open space in rural Upcountry is abundant and the project implementation of approximately six (6) acres for 13 single-family lots is not anticipated to negatively impact open space resources for the Upcountry region and is in keeping with the golf course residential character of this region. As previously noted, no improvements are proposed for the golf course site as part of the downzoning action.

10. Beach and Mountain Access

a. Existing Conditions

The project area is located Upcountry and surrounded by an existing golf course. The Cultural Impact Assessment did not indicate any traditional beach or mountain access through the project area.

b. Potential Impacts and Mitigation Measures

Since the project area is located a substantial distance away from coastal areas, there will be no impacts to beach access.

Also, the subject property is surrounded by the existing Pukalani Country Club Golf Course, specifically Holes Nos. 5, 6, and 7. The existing conditions of the surrounding land uses are not conducive for mountain access. Additionally, the Cultural Impact Assessment did not indicate any traditional accessways. Therefore, the proposed project is not anticipated to negatively impact mountain access.

11. Chemicals and Hazardous Materials

a. Existing Conditions

The subdivision site is currently vacant, undeveloped land. There is no existing use of chemicals and fertilizers on the subdivision property. The use of fertilizers and pesticides in the golf course operations is undertaken in strict accordance with all laws, regulations, and manufacturer's specifications. Furthermore, there is no evidence of hazardous materials within the project area.

b. Potential Impacts and Mitigation Measures

Since there is no evidence of chemicals and hazardous materials on the subdivision site, no mitigation measures for chemicals and hazardous materials on the subdivision site are proposed. The proposed subdivision will not require use of chemicals or hazardous materials.

As mentioned previously, the use of fertilizers and pesticides in the golf course operations is undertaken in strict accordance with all laws, regulations, and manufacturer's specifications. As such, there is no evidence of hazardous materials impacting the golf course site.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Community Character

a. Existing Conditions

The Upcountry region includes agricultural, rural, and suburban uses located on the western slope of Haleakala. Pineapple cultivation, smaller independent farming, and cattle ranching are the predominant agricultural activities within the region. The towns of Makawao and Pukalani are the region's main settlement areas and are characterized by a mixture of suburban and rural land uses. The region is home to many individuals who commute to work to other areas of the island. As previously mentioned, the immediate area can be characterized as a residential golf community. The project area is surrounded by the Pukalani Country Club Golf Course.

b. Potential Impacts and Mitigation Measures

The proposed project will be compatible with the community character of Pukalani, as the project will offer large single-family lots in keeping with the characteristics of the nearby residential golf community.

The downzoning request for the golf course site will not affect community character parameters.

2. Population

a. Existing Conditions

Maui County has exhibited relatively strong growth over the past decade with the 2000 population of 128,241, reflecting a 27.6 percent increase over the 1990 population of 100,504. Growth in the County is expected to continue,

with resident population projections for the year 2010 projected to be 151,300 and the year 2020 projected to be 174,450 (Maui County Planning Department, June 2006).

Just as the County's population continues to grow, the resident population of the Makawao-Pukalani-Kula Community Plan area has also increased. In 2005, the population of the Makawao-Pukalani-Kula region was 23,176 (SMS, June 2006). The resident population in the region is projected to increase to 27,792 in the year 2020 and to 29,294 by the year 2030 (SMS, June 2006). According to the County of Maui, Planning Department's draft Maui Island Plan, the growth in population would necessitate 824 new housing units in the Upcountry area.

b. Potential Impacts and Mitigation Measures

The proposed subdivision project will provide new housing opportunities to meet projected population growth and the homes will be in keeping with the community character of the surrounding neighborhoods.

3. Economy

a. Existing Conditions

The Makawao-Pukalani-Kula region, with its vast lands of pasture grass, has enabled cattle ranching and alternative ranching activities, such as sheep herding, which contribute to the economy. Pukalani and Makawao consist of commercial and service-based operations. With its fertile soil and cool climate conditions, the Kula region is renowned for produce and flower crops that are exported to domestic and international markets.

b. Potential Impacts and Mitigation Measures

Short-term economic benefits are anticipated during the construction phase of project implementation. Beyond construction-related spending, given the scope of the proposed action, there should be minimal economic impact on the economy.

4. Housing

a. Existing Conditions

As previously discussed, population in the Makawao-Pukalani-Kula region is estimated to increase by approximately 63 percent (Socio-Economic Forecast, June 2006). This increase in population will create a demand for additional 824 housing units in this region. The proposed subdivision site will increase the supply of available housing for Upcountry residents to meet this future demand. The proposed subdivision site will provide opportunities for market-priced, trade-up housing which is consistent with the surrounding neighborhoods.

As required by Maui County Code (MCC) Chapter 2.96, Workforce Housing, the proposed project will be required to provide six (6) workforce housing units or equivalent in-lieu fee or land.

b. Potential Impacts and Mitigation Measures

The applicant will comply with MCC 2.96 Workforce Housing. One (1) of the alternatives for compliance involves the purchasing workforce housing credits from Department of Hawaiian Home Lands (DHHL) as allowed by Hawaii Revised Statutes (HRS) Chapter 46-15.1 Housing, County Powers. HRS 46-15.1 allows DHHL to request for workforce housing credits for their projects and allows the credits to be transferable County-wide.

The second alternative is to provide six (6) workforce housing lots onsite.

Once a determination has been reached, a Residential Workforce Housing Agreement will be executed with the County of Maui, Department of Housing and Human Concerns for recordation at the Bureau of Conveyances prior to subdivision approval.

C. PUBLIC SERVICES

1. Police and Fire Protection

a. Existing Conditions

The County of Maui's Police Department is headquartered in Wailuku. The Department consists of several patrol, investigative, and administrative divisions. The Wailuku or Central station, which serves the Haiku, Paia, Makawao, Pukalani, and Kula regions, is situated approximately 11.0 miles northwest of the project area. The nearest police substation is located at the Eddie Tam Memorial Center on Makawao Avenue, approximately 2.5 miles from the project area.

Presently, fire prevention, suppression, and protection for the region is offered by the Department of Fire and Public Safety's Makawao and Kula Stations. The Makawao Station is located on Makawao Avenue, approximately 1.5 miles away from the project site. The Kula Station is located near the Kula Elementary School, approximately 5.0 miles away from the project site.

b. Potential Impacts and Mitigation Measures

Given the relatively minimal amount of additional housing units associated with the proposed subdivision, adverse impacts to police and fire protection services are not anticipated.

2. Medical Facilities

a. Existing Conditions

Maui Memorial Medical Center, the only major medical facility on the island, is located approximately 11.0 miles northwest of the project area. Licensed for 201 beds, this facility provides acute, general, and emergency care services. Several medical/dental offices are located in Pukalani and Makawao to serve the Upcountry region's residents.

Kula Hospital is situated about 10 miles south of the project site. The hospital serves as a long-term care facility that provides Alzheimer's and dementia care services. An out-patient clinic for the area's residents is open for operation from 8:00 a.m. to 4:30 p.m. on weekdays.

Ambulance service is located in Kula near Kula Hospital.

b. Potential Impacts and Mitigation Measures

The proposed 13-lot subdivision will not result in an extension of service area for medical facilities and medical emergency services, nor will it place significant new demand upon these services.

3. Schools

a. Existing Conditions

The State Department of Education (DOE) operates five (5) public schools in Upcountry Maui. They are Pukalani Elementary School, Makawao Elementary School, and Kula Elementary School for grades Kindergarten to 5, Kalama Intermediate School for grades 6 to 8, and King Kekaulike High School for grades 9 to 12.

DOE enrollment and projected enrollment for the schools are presented in **Table 3**.

Table 3. Public School Enrollment Estimates

School	Enrollment 2009-2010 School Year	Projected Enrollment 2011-2012
Pukalani Elementary School (Grades K to 5)	467	404
Makawao Elementary School (Grades K to 5)	419	451
Kula Elementary School (Grades K to 5)	362	405
Kalama Intermediate School (Grades 6 to 8)	729	871
King Kekaulike High School (Grades 9 to 12)	1,059	1,143
Source: State of Hawaii, Department of Education.		

The region is also served by privately operated Haleakala Waldorf School (grades Kindergarten to 8), Seabury Hall (grades 6 to 12), and the Kamehameha Schools Maui Campus (grades Kindergarten to 12).

b. Potential Impacts and Mitigation Measures

The DOE is being consulted through the Chapter 343, HRS environmental assessment review process. The relatively small number of lots associated with the proposed subdivision is not anticipated to create adverse conditions relative to school facilities requirements.

4. Recreational Facilities

a. Existing Conditions

The Pukalani Country Club Golf Course surrounds the project area. In the nearby vicinity of the project area, the Mayor Hannibal Tavares Community Center, located off of Old Haleakala Highway, about 1.0 mile north of the property, includes an aquatics center, playground, baseball, and soccer fields, in addition to the 11,440 square feet community center facility. In the Kulamalu area, there is a park, with a grassed field that can accommodate soccer and Pop Warner football activities. Parks and recreational facilities in the Kula region include the Waiakoa Gymnasium, which is host to youth

basketball games. Kula Park consists of a 10.3-acre ball field, two (2) soccer fields, playground equipment, two (2) picnic tables, a restroom, and two (2) parking areas.

Located along the upper slopes of Haleakala, Polipoli State Park and Haleakala National Park are State and Federal recreational facilities which provide residents with opportunities for hiking, camping, and sightseeing.

b. Potential Impacts and Mitigation Measures

The County of Maui's Department of Parks and Recreation is being consulted through the Chapter 343, HRS environmental assessment review process. The applicant intends to comply with Chapter 18.16.320 of the MCC relating to Parks and Playgrounds, through the payment of in-lieu fees.

5. Solid Waste Disposal

a. Existing Conditions

Solid waste collection and disposal is provided by the County's Department of Environmental Management (DEM) Solid Waste Division. Solid waste generated in the Upcountry region is transported to the Central Maui Landfill off Pulehu Road, approximately 5.5 miles southwest of the project site. Other than the Hana Landfill, the Central Maui Landfill is the only disposal site on the island of Maui that accepts County-hauled residential waste, commercially-hauled waste, and self-hauled waste.

Privately owned facilities, such as the Maui Demolition and Construction Landfill and the Pohakulepo Concrete Recycling Facility, accept solid waste and concrete from demolition and construction activities. These facilities are located at Maalaea, near Honoapiilani Highway's junction with North Kihei Road and Kuihelani Highway. A privately operated, green waste recycling facility is located at the Central Maui Landfill.

b. Potential Impacts and Mitigation Measures

Solid waste generated by the future homes will be collected by the County for disposal at the Central Maui Landfill. Solid waste generated by the 13-lot

subdivision will not adversely affect County services or infrastructure capacities for solid waste.

The design intent of the proposed subdivision site is to balance the cut and fill, thus minimizing construction waste associated with the improvements. Cleared and grubbed materials, from the construction of the proposed improvements, will be disposed for composting use, as practicable. Construction waste which may be generated from building the homes will be recycled or disposed of at the appropriate construction waste disposal location. The site construction company will be required to provide a construction master management plan with the intent to reduce construction waste. With these solid waste management measures, the contribution of the construction waste to the appropriate landfills will be minimized. Thus, the proposed subdivision site is not anticipated to adversely affect collection or capacity parameters of the County's solid waste system.

There will be no changes to the golf course site as part of the downzoning action and thus no impacts to solid waste facilities and capacity.

D. INFRASTRUCTURE

1. Roadways

a. Existing Conditions

Access to the project area is off of Aina Lani Drive, a two-lane, two-way private roadway owned and maintained by the Kulamalu Homeowners Association (HOA). There are bike lanes, curbs, gutters, and sidewalks mauka of the Liholani Street intersection. The posted speed limit is 20 miles per hour. The Kulamalu HOA is working with the County of Maui to dedicate this road to the County of Maui.

Liholani Street is a two-lane, two-way County roadway connecting Aina Lani Drive with Pukalani Street. There are curbs and gutters along both sides of the street. There is a sidewalk along the west side of the street only. The posted speed limit is 20 miles per hour.

The intersection of Aina Lani Drive at Liholani Street is a STOP sign controlled T-intersection. There are no separate turn lanes along the approaches.

Old Haleakala Highway is also located in the vicinity. Old Haleakala Highway is a two-lane, County collector road that extends in a northwest-southeast direction and provides a parallel route to Haleakala Highway through Pukalani. Old Haleakala Highway has a posted speed limit of 35 mph.

All traffic will access the project site via Pulelehuakea Street a stub out road along Aina Lani Drive. The nearest intersection to the proposed project driveway is Aina Lani Drive and Liholani Street and is the focal point of the project generated traffic and background traffic.

b. <u>Potential Impacts and Mitigation Measures</u>

A Traffic Impact Assessment Report for the proposed project has been prepared by Phillip Rowell & Associates. See **Appendix "E"**.

Existing traffic volumes at the intersection of Aina Lani Drive and Liholani Street were derived from manual traffic counts performed on April 1, 2010.

There are six (6) Levels-Of-Service (LOS), "A" through "F", which relate to the driving conditions from best to worst, respectively. In general, LOS "A" represents free-flow conditions with no congestion. LOS "F", on the other hand, represents severe congestion with stop-and-go conditions. Level-of-Service "D" is typically considered acceptable for peak hour conditions in urban areas.

The results of the level-of-service analysis of existing conditions are summarized in **Table 4**. Shown are the average vehicle delays and levels-of-service of the lane groups. All lane groups operate at Level-of-Service "A", reflecting good traffic operating conditions and minimal delays.

Table 4. Existing Levels-of-Service Analysis - Aina Lani Drive at Liholani Street

Approach and Movement	AM Peak Hour		PM Peak Hour	
	7:00 am to 8:00 am		3:00 pm to 4:00 pm	
	Delay[1]	LOS[2]	Delay[1]	LOS[2]
Eastbound Left & Thru	7.5	A	7.3	A
Southbound Left & Right	9.2	A	8.9	A

Source: Phillip Rowell & Associates, 2010.

NOTES:
1. Delay is in seconds per vehicle.
2. LOS denotes Level-of-Service calculated using the operations method described in Highway Capacity Manual: LOS is based on delay.
3. See Attachment D in Appendix "E" for Level-of-Service Calculation Worksheets.

The vehicle trip generation rates are based on the construction of 13 single-family lots. The trip generation calculations are summarized in **Table 5**. As shown, the proposed project will generate three (3) inbound and seven (7) outbound trips during the morning peak hour for a total of 10 trips. During the afternoon peak hour, the project will generate eight (8) inbound and five (5) outbound trips for a total of 13 trips.

Table 5. Trip Generation Calculations for Proposed Project

Time Period	Direction	Single-Family Detached Housing (LU Code 210)		
		Rate or % [1]	Occupied Units	Trips
AM Peak Hour	Total	0.77	13	10
	In	26%		3
	Out	74%		7
PM Peak Hour	Total	1.02	13	13
	In	64%		8
	Out	36%		5

Source: Phillip Rowell & Associates, 2010.

NOTES:
[1] Institute of Transportation Engineers, Trip Generation, Seventh Edition, 2003.

Existing traffic plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the existing (without project) peak hour traffic projections. This represents a worse-case condition. The traffic projection calculations are shown in **Table 6**.

Table 6. Traffic Projection Calculations Aina Lani Drive at Liholani Street

Approach and Movement		Existing Traffic (2009)		Project Trips		Existing Plus Project	
		AM	PM	AM	PM	AM	PM
North	Right	13	32			13	32
	Left	10	20	3	8	13	28
East	Right	39	17	7	5	46	22
	Thru	0	2			0	2
West	Thru	0	4			0	4
	Left	46	16			46	16
Totals		108	91	10	13	118	104

Source: Phillip Rowell & Associates, 2010.

The results of the existing traffic plus project traffic projections showed the total vehicle trips during the morning peak hour will generate 118 trips and during the afternoon peak hour total vehicle trips will generate 104 trips.

The results of the future level-of-service analysis are summarized in **Table 7**. Shown are the average vehicle delays and the levels-of-service of the lane groups. The analysis concluded that all traffic movements will operate at Level-of-Service "A", reflecting good operating conditions and minimal delays.

Table 7. 2012 Levels-of-Service Analysis - Aina Lani Drive at Liholani Street

	AM Peak Hour				PM Peak Hour			
	Without Project		With Project		Without Project		With Project	
Approach and Movement	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
Eastbound Left & Thru	7.5	A	7.5	A	7.3	A	7.3	A
Southbound Left & Right	9.2	A	9.4	A	9.0	A	9.0	A

Source: Phillip Rowell & Associates, 2010.

NOTES:
1. Delay is in seconds per vehicle.
2. LOS denotes Level-of-Service calculated using the operations method described in Highway Capacity Manual: LOS is based on delay.
3. See Attachment D in Exhibit "E" for Level-of-Service Calculation Worksheets.

In summary, the conclusions of the traffic impact assessment indicated that the proposed project will generate 3 inbound and 7 outbound trips during the morning peak hour. During the afternoon peak hour, the project will generate 8 inbound and 5 outbound trips. The level-of-service analysis concluded that all controlled traffic movements at the study intersection of Aina Lani Drive and Liholani Street will operate at Level-of-Service "A". As all traffic movements will operate at Level-of-Service A, no mitigation is recommended.

Based on the traffic engineer's findings, there should be no adverse trip generation or adverse impact associated with traffic operations as a result of the proposed subdivision.

2. Water

a. Existing Conditions

The County of Maui, Department of Water Supply (DWS) provides water service for the area. The water system in the area consists of an 850,000 gallon reservoir and various distribution lines. The 850,000 gallon reservoir, located about 1,800 feet from the subdivision site, provides storage and supplies the distribution system for the area. Twelve-inch distribution lines transport the water from the reservoir to locations on Liholani Street and Aina Lani Drive. The proposed subdivision may connect into an existing 8-inch waterline along a stub out road, Pulelehuakea Street. There are two (2) fire hydrants on Aina Lani Drive which are approximately 100 feet from the subdivision site.

b. Potential Impacts and Mitigation Measures

Water system improvements for the proposed subdivision include 8-inch water lines, fire hydrants, and service laterals. The subdivision site's average daily water demand is anticipated to be approximately 7,800 gallons per day, based on 600 gallons per day for each single-family home. Refer to **Appendix "A"**. Water requirements will be coordinated with the DWS to ensure that adequate supply is available at the time of construction. In addition, calculations for domestic, irrigation, and fire protection will be submitted to the DWS in connection with the processing of the project's building permit application.

It is noted that the DWS provided early comments on the project stating that the "*site is located in an area affected by the finding of inadequate water supply issued on March 16, 1993.*" In light of this condition, the applicant has identified the following potential alternatives to address water source constraints.

(1) Purchase Water Credits

One (1) of the alternatives is to purchase water resource credits from Dowling Company, Inc. (DCI). DCI has several water resource credits from the County of Maui that are transferable.

(2) **Desalinization**

The applicant is also considering development of a reverse osmosis plant using an existing water well that irrigates the Pukalani Country Club Golf Course. The applicant is working with DWS to determine the feasibility of the plant.

Other mitigation measures will include pollution prevention as suggested by DWS as the site overlies the Makawao aquifer. The goal is to protect the integrity of surface and groundwater resources. To this end, the following mitigation measures will be implemented to prevent water pollution related impacts during construction of the subdivision.

- Construction of drainage control features, such as berms and silting basins.
- Maintenance of the drainage control features.
- Retain ground cover until the last possible date.
- Stabilization of denuded areas by sodding or planting as soon as possible.
- Control dust by proper stockpiling and use of non-potable water for dust control.
- Prevent construction products, oil, fuel, and other substances from falling or leaching into the ground by using proper containment and maintenance practices.

Additionally, the project will include the following water conservation measures within the subdivision design and purchase agreements for the sale of the lots.

- Low-flow fixtures and devices will be required.
- Once landscaping has been established, landscape watering will be restricted to after 7:00 p.m. at night and before 10:00 a.m. in the morning.

- A landscape guide will be provided for future homeowners that will include climate adapted native plant species with the objective to conserve water and protect the watershed from invasive alien species.

It is noted that there will be no changes to golf course operation associated with the downzoning request for the golf course site.

3. Wastewater

a. Existing Conditions

The project area is located in the Critical Wastewater Disposal Area as determined by the Maui County Wastewater Advisory Committee according to Department of Health, Wastewater Branch. Thus, no new cesspools are allowed in the area.

Hawaii Water Service Company owns and operates the Pukalani Sewerage Treatment Works, a private wastewater collection and treatment facility that serves the Pukalani Terrace and Country Club development. The collection system consists of gravity sewers, force mains, and pump stations. The collection system carries wastewater to the Pukalani Wastewater Treatment Plant for treatment and disposal.

b. Potential Impacts and Mitigation Measures

Wastewater service for the proposed subdivision will be provided by Pukalani Sewerage Treatment Works. Refer to **Appendix "A"**. The proposed subdivision is estimated to generate approximately 4,550 gallons per day of wastewater based on 350 gallons per day per single-family home. Wastewater improvements include offsite and onsite gravity sewers. Improvements consist of 8-inch sewer mains, 6-inch sewer laterals, and manholes. These lines will connect to the existing collection systems adjacent to the project area within Hole 5 of the golf course. The proposed land use entitlements requests are not expected to negatively impact the existing wastewater system capacities or facilities.

4. Drainage

a. Existing Conditions

There are no existing drainage improvements on the subdivision project site. Stormwater runoff sheet flows across the site and through the golf course. Concrete curbs, gutters, and catch basins along Liholani Street collect the stormwater runoff and direct the collected runoff to Kaluapulani Gulch. As mentioned previously, Kaluapulani Gulch is not listed as a perennial stream according to Hawaii Stream Assessment. The existing 50-year, 1-hour peak flow is approximately 8.65 cubic feet per second (cfs). Refer to **Appendix "A"**.

b. Potential Impacts and Mitigation Measures

Based on the County of Maui regulations, the drainage system will be designed to handle a storm with a recurrence interval of 50 years since the drainage area is less than 100 acres. The proposed subdivision will result in an approximate 50-year, 1-hour peak flow of 18.35 cfs which is an increase of 9.70 cfs. The increase in the rate of runoff will be mitigated by construction of a drainage system that includes swales, catch basins, manholes, drain pipes, a culvert, and a detention/retention basin. In general, these improvements will direct offsite runoff around the site and onsite runoff to the detention/retention basin that captures the 9.70 cfs increase in runoff from the proposed project. To prevent offsite runoff from entering the site, cut-off swales will direct offsite flows around the site. A culvert at the entry road on the southerly side of the site will convey offsite flows under the road and to the downstream areas.

As such, the proposed action will not result in increased runoff from existing conditions. Refer to **Appendix "A"**. Therefore, there should be no significant adverse effects on the adjacent or downstream properties.

As previously noted, there are no improvements proposed for the golf course site, and the downzoning request for this site will not affect existing drainage conditions.

5. Electrical, Telephone, and CATV

a. Existing Conditions

The distribution system for electrical, telephone, and cable television (CATV) services in the region are provided by Maui Electric Company, Ltd., Hawaiian Telcom, and Oceanic Time Warner Cable, respectively.

b. Potential Impacts and Mitigation Measures

The subdivision project will be served by new underground lines that connect to existing nearby facilities. The utility companies have indicated that services are available for the proposed project. The proposed project is not anticipated to adversely affect electrical or communication systems.

E. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

A "secondary impact" or "indirect effect" from the proposed action means:

> *effects which are caused by the action and are later in time or further removed in distance, but are still reasonable foreseeable.*

The proposed subdivision is not part of a larger action. It is noted, however, that the Maui County Council continues to review the draft Maui Island Plan which would delineate urban and rural growth boundaries. The proposed subdivision site and existing Pukalani Country Club Golf Course is within the proposed urban growth boundary for the Makawao-Pukalani-Kula planned growth areas. Other projects within this region, as identified in the draft Maui Island Plan, include the following. See **Table 8**.

Table 8. Proposed Development in the Region

Development	Land Use	Total Units / Acres
Makawao Makai	Residential	90 units
Seabury Hall	Residential and School Facilities	80 units / 73 acres
Pukalani Expansion	Residential	311 units
Pukalani Makai	Residential	250 units
Source: County of Maui, Department of Planning.		

The foregoing developments in the Makawao-Pukalani-Kula region were the basis for analyzing the potential cumulative and secondary impacts related to the development of the subdivision site. It is noted that, although, all of these projects are listed in the draft Maui Island Plan, these projects may not necessarily be constructed. It is further noted that the planning horizon of the draft Maui Island Plan and, thus, the listed projects are for year 2030.

At the time of this writing, the County of Maui, Planning Department is recommending that the draft Maui Island Plan provide for an additional 824 housing units for the Makawao-Pukalani-Kula region. And, as previously indicated, the proposed project area is within the urban growth boundary. The assessment of the cumulative and secondary impacts is undertaken in the context of the draft Maui Island Plan. The proposed subdivision site will provide for a small amount of future housing units that will meet the expected housing demand as indicated by the draft Maui Island Plan.

In regards to the cumulative and secondary impacts to the physical environment, natural environment, socio-economic environment, public services and infrastructure, the draft Maui Island Plan has identified the listed proposed developments, including the proposed subdivision, as future growth areas that balance the population growth and the impacts to the environmental context of the region. And, as discussed in the previous sections, aside from the direct proposed subdivision impacts, cumulative and secondary impacts are not anticipated to result in significant adverse impacts.

III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

The State Land Use Law, Chapter 205, Hawaii Revised Statutes (HRS), is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare for Hawaii's people. All lands in the State are classified into four (4) land use districts by the State Land Use Commission: "Urban", "Agricultural", "Conservation", and "Rural".

The subdivision and golf course sites are situated within the State "Urban" district. See **Figure 9**. By statute, "Urban" districts shall include activities or uses as provided by ordinances or regulations of the County within which the "Urban" district is situated. The proposed subdivision and golf course land use requests are compatible with, and permitted within, the State "Urban" district.

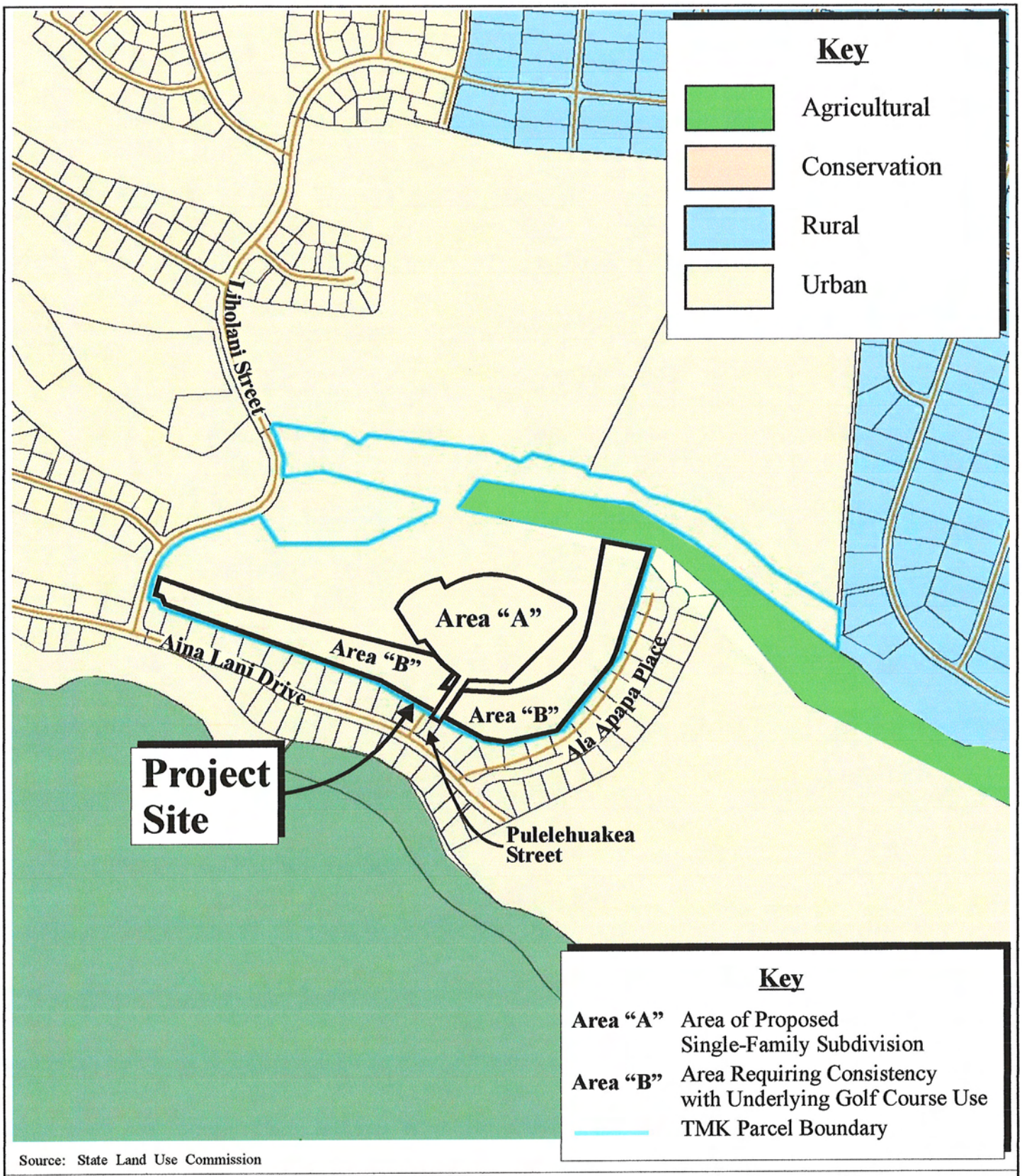
B. HAWAII STATE PLAN

Chapter 226, HRS, also known as the Hawaii State Plan, is a long-range comprehensive plan which serves as a guide for the future long-range development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. The proposed action is consistent with the following goals of the Hawaii State Plan.

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations.
- Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.

Objectives and Policies of the Hawaii State Plan

The proposed action is consistent with the following objectives and policies of the Hawaii State Plan:



Source: State Land Use Commission

Figure 9 Proposed Pulelehuakea Residential Subdivision

State Land Use Designations

NOT TO SCALE

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani36\SLUC

Section 226-5 Objective and policies for population

It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

- Manage population growth statewide in a manner that provides increase opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.

- Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

Section 226-19 Objectives and policies for socio-cultural advancement-housing

Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:

- The orderly development of residential areas sensitive to community needs and other land uses.

To achieve the housing objectives, it shall be the policy of this State to:

- Effectively accommodate the housing needs of Hawaii's people.

- Increase home ownership and rental opportunities and choices in terms of quality, location, cost densities, style, and size of housing.

- Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

- Facilitate the use of available vacant, developable, and underutilized urban lands for housing.

C. MAUI COUNTY GENERAL PLAN

As indicated by the Maui County Charter, the purpose of the general plan shall be to:

> *... indicate desired population and physical development patterns for each island and region within the county; shall address the unique problems and needs of each island and region; shall explain opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns and characteristics of future*

developments. The general plan shall identify objectives to be achieved, and priorities, policies, and implementing actions to be pursued with respect to population density; land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development.

Chapter 2.80B of the Maui County Code, relating to the General Plan and Community Plans, implements the foregoing Charter provision through enabling legislation which calls for a Countywide Policy Plan and a Maui Island Plan. The Countywide Policy Plan was adopted as Ordinance No. 3732 on March 24, 2010. The Maui Island Plan is currently in the process of review and formulation by the Maui County Council.

With regard to the Countywide Policy Plan, Section 2.80B.030 of the Maui County Code states the following.

The countywide policy plan shall provide broad policies and objectives which portray the desired direction of the County's future. The countywide policy plan shall include:

1. *A vision for the County;*
2. *A statement of core themes or principles for the County; and*
3. *A list of countywide objectives and policies for population, land use, the environment, the economy, and housing.*

Core principles set forth in the Countywide Policy Plan are listed as follows:

1. Excellence in the stewardship of the natural environment and cultural resources;
2. Compassion for and understanding of others;
3. Respect for diversity;
4. Engagement and empowerment of Maui County residents;
5. Honor for all cultural traditions and histories;
6. Consideration of the contributions of past generations as well as the needs of future generations;
7. Commitment to self-sufficiency;
8. Wisdom and balance in decision making;
9. Thoughtful, island appropriate innovation; and

10. Nurturance of the health and well-being of our families and our communities.

Congruent with these core principles, the Countywide Policy Plan identifies goals objectives, policies and implementing actions for pertinent functional planning categories, which are identified as follows:

1. Natural environment
2. Local cultures and traditions
3. Education
4. Social and healthcare services
5. Housing opportunities for residents
6. Local economy
7. Parks and public facilities
8. Transportation options
9. Physical infrastructure
10. Sustainable land use and growth management
11. Good governance

With respect to the proposed Pulelehuakea Residential Subdivision and golf course site land entitlements, the following goals, objectives, policies and implementing actions are illustrative of the project's compliance with the Countywide Policy Plan.

EXPAND HOUSING OPPORTUNITIES FOR RESIDENTS

Goal: Quality, island-appropriate housing will be available to all residents.

Objective: 2. Increase the mix of housing types in towns and neighborhoods to promote sustainable land use planning, expand consumer choice, and protect the County's rural and small town character.

d. Promote infill housing in urban areas at scales that capitalize on existing infrastructure, lower development costs, and are consistent with existing or desired patterns of development.

PROMOTE SUSTAINABLE LAND USE AND GROWTH MANAGEMENT

Goal: Community character, lifestyles, economies, and natural assets will be preserved by managing growth and using land in a sustainable manner.

Objective: 1. Improve land use management and implement a directed-growth strategy.

b. Direct urban and rural growth to designated areas.

e. Encourage redevelopment and infill in existing communities on lands intended for urban use to protect productive farm land and open-space resources.

3. Design all developments to be in harmony with the environment and to protect each community's sense of place.

c. Protect and enhance the unique architectural and landscape characteristics of each Community Plan Area, small town, and neighborhood.

In summary, the proposed land use requests are consistent with the themes and principles of the Countywide Policy Plan.

D. MAKAWAO-PUKALANI-KULA COMMUNITY PLAN

The project site is located within the Makawao-Pukalani-Kula Community Plan region, one (1) of nine (9) Community Plan regions established in the County of Maui. Planning for each region is guided by the respective community plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns, and characteristics of future development in the region.

The Makawao-Pukalani-Kula Community Plan was adopted by the County of Maui through Ordinance No. 2510, which took effect on July 23, 1996.

Land use guidelines are set forth by the Makawao-Pukalani-Kula Community Plan Land Use Map. The existing Community Plan land use designation for the proposed subdivision area is "SF, Single-Family" and "PK (GC) Park (Golf Course)". Refer to **Figure 3**. The proposed Community Plan land use amendment for the subdivision site is to change the "Park (Golf Course)" designation to "SF, Single Family". To downzone the existing golf course site, the

Community Plan land use amendment is to change the "SF, Single Family" to "PK (GC), Park (Golf Course)". Refer to **Figure 5**.

The proposed entitlements action is consistent with the following goals, objectives, and policies set forth in the Makawao-Pukalani-Kula Community Plan.

LAND USE

Goal: The maintenance and enhancement of Upcountry's unique and diverse rural land use character with sensitivity to existing land use patterns, natural resource values, and economic and social needs of the region's residents.

Objectives and Policies:

6. Encourage new residential developments in areas which are contiguous extensions of, or infills within the established residential pattern, and which do not adversely affect agricultural uses.

8. Preserve and enhance the "country" atmosphere in all communities by maintaining the small-scale, unique and independent character of each of the three sub-regions. "Country" atmosphere is defined by building style, a low density mix of residences, ranches, open spaces, greenways, planting and cultivated lands.

10. Support the development of a regulatory review process which encourages and facilitates public participation in all major land development activities.

16. Recognize the four (4) semi-urban centers of Makawao Town, Pukalani, Haliimaile and Waiakoa Village. Within them, support the following land use and circulation patterns:

    b. Within Pukalani

    Limited multi-family use located adjacent to open space resources and consistent in scale and character with surrounding single-family uses.

21. Ensure an adequate supply of lands designated for residential use to provide opportunity for residents to participate in housing market "trade-ups".

URBAN DESIGN

Goal: Recognition and preservation of the unique design characteristics of the Makawao, Pukalani and Kula communities in order to enhance Upcountry's man-made environment.

Objectives and Policies:

8. Enforce a two-story or 35-foot height limitation throughout the region, except for public/quasi-public uses such as auditoriums, gymnasiums, and fire stations.

HOUSING

Goal: Housing opportunities for the residents of Makawao-Pukalani-Kula, to include all income and age groups, which are affordable, safe, and environmental and culturally compatible.

5. To establish an efficient settlement pattern, discourage a dispersed pattern of development, thereby reducing public service, infrastructure and maintenance costs.

E. COUNTY ZONING

As described in Chapter I, Project Overview of this EA, the subdivision site is designated "D-1, Two-Family Duplex", "R-1, Residential", and "PK-4, Golf Course Park District" for Maui County Zoning. Refer to **Figure 4**. The requested zoning designation for the subdivision site is to change the aforementioned designations to "R-3, Residential" zoning. For the golf course site, a Change in Zoning (CIZ) is requested to downzone the areas designated as "R-1, Residential" and "R-2, Residential" to "PK-4, Golf Course Park District". Refer to **Figure 6**. The proposed CIZ would establish land use consistency with the designations proposed for the Community Plan Amendment. To enable project implementation, a CIZ application has been prepared for the project area.

A portion of the proposed subdivision area is designated as "D-1, Duplex" which allows approximately 20 duplex units. The proposed development calls for 13 single-family units. The reduced units would have fewer impacts than the currently zoned "D-1, Duplex". Furthermore, single-family homes are more in character with the surrounding neighborhood.

F. COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES

The Hawaii Coastal Zone Management Program (HCZMP), as formalized in Chapter 205A, HRS, establishes objectives and policies for the preservation, protection, and restoration of natural resources of Hawaii's coastal zone. The subject property does not lie within the County of Maui's Special Management Area (SMA).

Although the project is not with the SMA, this section addresses the project's relationship to applicable coastal zone management considerations, as set forth in Chapter 205A, HRS.

1. Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreational planning and management; and

b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: The proposed subdivision site and golf course site are located upland and away from the coastline. As such, the proposed actions are not expected to impact coastal recreational opportunities or affect existing public access to the shoreline.

2. Historical/Cultural Resources

Objective: Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

a. Identify and analyze significant archeological resources;

b. Maximize information retention through preservation of remains and artifacts or salvage operations; and

c. Support state goals for protection, restoration, interpretation, and display of historic resources.

Response: The archaeological survey of the project area did not locate any archaeological sites or cultural artifacts. The CIA reports that there are no known cultural practices within the project area. Should cultural deposits and/or human burials be inadvertently discovered during earth moving activities, work in the immediate area of the find shall cease, and the find shall be protected from further disturbance. The SHPD and OHA shall also be immediately notified to establish appropriate mitigation measures pursuant to Chapter 6E, HRS.

3. Scenic and Open Space Resources

Objectives: Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

a. Identify valued scenic resources in the coastal zone management area;

b. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

d. Encourage those developments that are not coastal dependent to locate in inland areas.

Response: The proposed project area is located a significant distance away from the coastline and will not affect coastal scenic resources. Open space in rural Upcountry is abundant and the project implementation of approximately six (6) acres for 13 single-family lots is not anticipated to negatively impact open space resources.

4. Coastal Ecosystem

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

b. Improve the technical basis for natural resource management;

c. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

d. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: Drainage and runoff mitigation measures will be implemented during the construction of subdivision site. In the long term, the proposed land use actions are not expected to adversely impact coastal ecosystems.

5. Economic Use

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

a. Concentrate coastal dependent development in appropriate areas;

b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

   (i) Use of presently designated locations is not feasible;

   (ii) Adverse environmental effects are minimized; and

   (iii) The development is important to the State's economy.

Response: The proposed subdivision and existing golf course are not coastal dependent and are located upland in an area appropriate for residential use. Short-term economic benefits are anticipated during the construction phase. Beyond construction-related spending, there are no anticipated long-term adverse or beneficial economic impacts.

6. Coastal Hazards

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

Policies:

a. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

b. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

c. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

d. Prevent coastal flooding from inland projects.

Response: The lands proposed for entitlements action lie within an area of minimal flooding and well outside of the tsunami inundation zone. Best Management Practices (BMPs) will be employed to ensure that the subject property and adjoining lands are not subject to new hazards. The proposed actions will not adversely affect downstream and adjoining properties from the effects of flooding and erosion.

7. **Managing Development**

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

b. Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and

c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Response: This Environmental Assessment has been prepared for public review in accordance with Chapter 343, HRS, and Chapter 200 of Title 11, Hawaii Administrative Rules, *Environmental Impact Statement Rules*.

Opportunity for review of the proposed action will be available during the various regulatory permit processes involving the Maui Planning Commission and Maui

County Council. Furthermore, community informational meetings were held on January 14, 2010, January 20, 2010, March 9, 2010, and March 24, 2010. See **Appendix "F"**. Since then, the applicant has been working with the surrounding neighbors to continue dialogue in addressing issues and concerns.

8. Public Participation

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

a. Promote public involvement in coastal zone management processes;

b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: Opportunities for public awareness, education, and participation are available throughout the environmental and land use regulatory review processes. As mentioned previously, community informational meetings were held on January 14, 2010, January 20, 2010, March 9, 2010, and March 20, 2010. Refer to **Appendix "F"**.

9. Beach Protection

Objective: Protect beaches for public use and recreation.

Policies:

a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

b. Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

c. Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: The project area is located inland, and away from the shoreline. The proposed actions will not have any impact on shoreline processes.

10. Marine Resources

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

d. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: Given the location of the proposed project, which is a significant distance from shoreline areas, the proposed actions will not adversely impact coastal marine resources.

In addition to the foregoing objectives and policies, SMA permit review criteria pursuant to Act 224 (2005) provides that:

No special management area use permit or special management area minor permit shall be granted for structures that allow artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:

(1) Directly illuminates the shoreline and ocean waters; or

(2) Is directed to travel across property boundaries toward the shoreline and ocean waters.

The project area is not located near the shoreline. In any case, the proposed subdivision lighting design will consider the need for shielding of all lights and use of directional down lighting. The design considerations will mitigate light pollution and prevent lighting from traveling across property boundaries. In addition, construction work hours will be limited to day time hours. Thus, no construction night lights will be utilized. Furthermore, the proposed subdivision will comply with Maui County's Outdoor Lighting regulations as identified in MCC Chapter 20.35, Outdoor Lighting.

IV. SUMMARY OF UNAVOIDABLE ENVIRONMENTAL IMPACTS

IV. SUMMARY OF UNAVOIDABLE ENVIRONMENTAL IMPACTS

The proposed action involves land use changes to allow for the following:

1. A 13-lot single-family subdivision,

2. Recognition of the on-going use of the Pukalani Country Club Golf Course.

The proposed construction of the subdivision will have a limited, unavoidable construction-related impact on the environment, as described in Chapter II of this report.

Potential effects include noise-generated impact associated with site preparation and construction activities. In addition, there may be a temporary impact on air quality associated with dust generation and discharge of exhaust from construction equipment. It should be noted, however, that construction-related impacts will be mitigated through the use of Best Management Practices (BMPs).

No significant unavoidable environmental impacts are anticipated with the land entitlements for the golf course site.

No significant, long-term adverse environmental impacts are anticipated as a result of the proposed land use entitlements request and the associated development of the single-family subdivision or the existing golf course operation.

V. ALTERNATIVES TO THE PROPOSED ACTION

V. ALTERNATIVES TO THE PROPOSED ACTION

A. PREFERRED ALTERNATIVE

Under the Preferred Alternative, the proposed subdivision site will provide 13 single-family residential lots on existing vacant land surrounded by the Pukalani Country Club Golf Course. And, the proposed golf course site will downzone existing residential zoning to be consistent with the golf course use.

The proposed subdivision will provide housing opportunities to meet future housing demand in this region for market priced, trade-up homes. A portion of the subdivision site already has land use entitlements for residential housing, as indicated by the "SF, Single-Family" Community Plan designation and the "D-1, Two-Family Duplex" Maui County zoning. However, duplex units would not be compatible in the context of the surrounding neighborhood character.

In regards to the downzoning of the golf course site, this action would make the land use designation consistent to the existing golf course use. There are no changes to the golf course associated with the downzoning. The downzoning of "R-1" and "R-2, Residential" districts to "PK-4, Golf Course Park" district would ensure long-term viability of the Pukalani Country Club Golf Course and would eliminate the opportunity to urbanize the golf course site.

Furthermore, as concluded previously, the proposed project would not have significant, long-term adverse environmental impacts. As such, the proposed project as described in detail in Chapter I, was deemed the preferred alternative for this site.

B. NO ACTION ALTERNATIVE

The proposed subdivision will provide housing opportunities in the Makawao-Pukalani-Kula region. Under the "no action" alternative, the subdivision site would remain vacant and the underlying Community Plan and Maui County zoning would remain for future opportunities to urbanize the existing portion that is zoned "D-1, Duplex" and "R-1 and R-2, Residential".

The "no action" alternative would not implement a portion of the subdivision's area intended use for residential housing, as indicated by the "SF, Single-Family" Community Plan designation and the "D-1, Two-Family Duplex" Maui County zoning. This alternative would not produce any housing units. Thus, the "no action" alternative would not address the need for housing in the Makawao-Pukalani-Kula region. According to the County of Maui, Planning Department's draft Maui Island Plan, the growth in population would necessitate 824 new housing units in the Upcountry area.

Further, the "no action" alternative may not ensure the long-term viability of the Pukalani Country Club Golf Course. The downzoning of "R-1" and "R-2, Residential" districts to "PK-4, Golf Course Park" district on the golf course site would ensure the long-term use for golf course. Without this action, the potential would always be present for urbanization of the current zoned area and thus, reduce the area for a golf course and potentially the playability of the course.

C. DUPLEX UNITS

The "duplex units" alternative would implement the current "SF, Single Family" Community Plan designation and current "D-1, Two-Family Duplex" zoning district for a portion of the subdivision site. According to land use regulations for "D-1, Two-Family Duplex", potentially up to 20 units could be built in duplex configuration. The "duplex unit" alternative would provide for housing opportunities to meet future population growth in the area.

However, the "duplex units" alternative would create additional environmental impacts and additional demands on infrastructure (e.g. sewer, water, roadways, etc.) and public services as compared to the proposed action of 13 single-family lots. Additionally, the higher density would not be an appropriate density within the surrounding community. The surrounding neighborhoods are predominantly detached single-family units and higher density duplex housing is not an appropriate fit given the community character of the area.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

As noted previously, the proposed land use actions are not anticipated to have significant adverse environmental effects. Development of the proposed subdivision will involve a commitment of energy, labor, fiscal, and material resources. The use of such resources, when weighed against the expected benefit of future housing to be derived from the project, is not an adverse commitment. Furthermore, the golf course site is also not an adverse commitment since there are no changes associated with the downzoning.

VII. SIGNIFICANCE CRITERIA ASSESSMENT

VII. SIGNIFICANCE CRITERIA ASSESSMENT

The "Significance Criteria", Section 12 of the Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the proposed project will have significant impacts to the environment. The following analysis is provided.

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.**

   The proposed project will not involve an irrevocable commitment to loss or destruction of any natural or cultural resources. There are no long-term adverse impacts on air and visual resources from the proposed project. There are short-term construction-related impacts for air and noise quality, but these will be mitigated through implementation of appropriate Best Management Practices. A view analysis was conducted from the neighboring Kulamalu Subdivision and to protect view planes, Lots 1 and 2 of the proposed subdivision will be limited to a building height of 25 feet.

   The project area was formerly used for pasture and was disturbed in connection with Pukalani Country Club Golf Course. The archaeological survey of the subdivision site did not locate any archaeological sites or cultural artifacts. The cultural impact assessment did not find any on-going cultural practices within the project area. Should any cultural artifacts or human remains be encountered during construction, work in the immediate vicinity of the find will cease and the find will be protected from further disturbance. The State Historic Preservation Division will be immediately notified to establish an appropriate mitigation strategy.

   Furthermore, there are no changes associated with the downzoning of the golf course site, thus, there will be no irrevocable commitment to loss or destruction of any natural or cultural resources.

2. **Curtails the range of beneficial uses of the environment.**

The proposed actions will not curtail the range of beneficial uses of the environment. There are no anticipated impacts to climate, topography, and soils from the proposed project. There are also no known rare, threatened, or endangered species of flora, fauna, or avifauna located within the project areas. Refer to **Appendix "B"**. Furthermore, the proposed project is a significant distance from the coastline. As such, there will be no adverse impacts to coastal resources anticipated.

3. **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

The State's Environmental Policy and Guidelines are set forth in Chapter 344, Hawaii Revised Statutes. The proposed project fosters and promotes the general welfare, creates conditions under which humanity and nature can exist in productive harmony, and fulfill the socio-economic requirements of the people of Hawaii. The proposed action is consistent with the policies and guidelines.

4. **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.**

In regards to socio-economic welfare, the proposed subdivision site will address the need for housing in the Upcountry area. And, there will be a short-term economic benefit from construction activities.

The cultural impact assessment did not identify any on-going cultural practices occurring within the project area; and as such, cultural practices will not be impacted.

Additionally, there are no changes associated with the downzoning of the golf course site, thus, there will be no effect to economic welfare, social welfare, and cultural practices of the community or State.

5. **Substantially affects public health.**

Given the proposed action of the subdivision site to provide a limited number of new house lots, no adverse impacts to the public's health and welfare are anticipated as a result of the proposed project. Design and construction of the proposed subdivision

will be undertaken in compliance with applicable State and County laws and regulations.

Also, as previously mentioned, there are no changes with the downzoning of the golf course site, thus, there will be no effects to public health.

6. **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

No secondary impacts, such as population changes, are anticipated as a result of the proposed project given the small number of additional housing units and downzoning of the golf course. There are no anticipated adverse effects on public services, such as police, fire, medical, educational, or solid waste collection.

7. **Involves a substantial degradation of environmental quality.**

As previously mentioned, adverse impacts are not anticipated from the proposed project for the natural resources, cultural resources, and the natural environment. The proposed project is not anticipated to have an adverse impact on the environmental quality of the project area.

8. **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.**

The proposed project does not involve a commitment to larger actions.

9. **Substantially affects a rare, threatened, or endangered species, or its habitat.**

There are no rare, threatened, or endangered species of flora, fauna, or avifauna or their habitats on the project area. Refer to **Appendix "B"**.

10. **Detrimentally affects air or water quality or ambient noise levels.**

The proposed project is not anticipated to have a significant long-term impact on air and water quality or ambient noise levels. There are short-term construction-related impacts for air and noise quality for the subdivision site but these will be mitigated by implementing appropriate Best Management Practices.

Again, there are changes associated with the downzoning of the golf course site, so there are no effects to air or water quality or ambient noise levels.

11. **Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.**

The proposed project area is located Upcountry, away from the shoreline, and would not affect environmentally sensitive coastal areas. The project area is not subject to flooding or tsunami inundation. Soils of the project area are not erosion-prone. There are no geologically hazardous lands, estuaries, or coastal waters in proximity to the project area.

12. **Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.**

The project area is not situated in an area identified as a significant scenic vista or view plane in any County and State plans. However, the views from the surrounding homes can be characterized as providing good makai and mauka views for individual surrounding homeowners. As such, a view plane analysis was conducted in collaboration with the Kulamalu Subdivision Homeowners Association. To protect view planes for the surrounding homes, Lots 1 and 2 will be restricted to a building height of 25 feet.

13. **Requires substantial energy consumption.**

In the long term, the single-family homes will generate additional demand for electricity. However, this demand will not be substantial or excessive within the context of the region's overall energy consumption.

Furthermore, there are no changes with the downzoning of the golf course site, thus, there will be no additional energy consumption.

Based on the aforementioned findings, it is anticipated that the proposed action will result in a Finding of No Significant Impact (FONSI).

VIII. LIST OF PERMITS AND APPROVALS

VIII. LIST OF PERMITS AND APPROVALS

The following permits and approvals are anticipated to be needed for project implementation:

State of Hawaii

1. National Pollutant Discharge Elimination System (NPDES) Permit, as required
2. Community Noise Permit, as required

County of Maui

1. Chapter 343, Hawaii Revised Statutes (HRS) Environmental Review
2. Community Plan Amendment
3. Change in Zoning
4. Subdivision Approval
5. Grading Permit
6. Building Permit
7. Construction Permits

IX. AGENCIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

IX. AGENCIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were consulted during preparation of the Draft Environmental Assessment. Agency comments and responses to substantive comments are also included in this section.

1. Ranae Ganske-Cerizo, Soil Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
210 Imi Kala Street, Suite 209
Wailuku, Hawaii 96793-2100

2. George Young
Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Regulatory Branch
Building 230
Fort Shafter, Hawaii 96858-5440

3. Patrick Leonard
Field Supervisor
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122, Box 50088
Honolulu, Hawaii 96813

4. Russ Saito, State Comptroller
Department of Accounting and General Services
1151 Punchbowl Street, #426
Honolulu, Hawaii 96813

5. Theodore E. Liu, Director
State of Hawaii
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

6. Chiyome Fukino, M.D., Director
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814

7. Alec Wong, P.E., Acting Chief
Clean Water Branch
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814

8. Patti Kitkowski
Acting District Environmental Health Program Chief
State of Hawaii
Department of Health
54 High Street
Wailuku, Hawaii 96793

9. Laura Thielen, Director
State of Hawaii
Department of Land and Natural Resources
P.O. Box 2359
Honolulu, Hawaii 96804

10. Dr. Puaalaokalani Aiu, Administrator
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707

11. Patty Conte
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
130 Mahalani Street
Wailuku, Hawaii 96793

12. Katherine Kealoha, Director
Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813

13. Clyde Namuo, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

14. Abbey Seth Mayer, Director
State of Hawaii
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804

15. Dan Davidson, Executive Officer
State of Hawaii
State Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804

16. University of Hawaii at Manoa
Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

17. Deidre Tegarden, Director
County of Maui
Office of Economic Development
2200 Main Street, Suite 305
Wailuku, Hawaii 96793

18. Gen Iinuma, Administrator
Maui Civil Defense Agency
200 South High Street
Wailuku, Hawaii 96793

19. Jeffrey A. Murray, Fire Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732

20. Lori Tsuhako, Director
County of Maui
Department of Housing and Human Concerns
One Main Plaza
2200 Main Street, Suite 546
Wailuku, Hawaii 96793

21. Tamara Horcajo, Director
County of Maui
Department of Parks and Recreation
700 Halia Nakoa Street, Unit 2
Wailuku, Hawaii 96793

22. Jeffrey Hunt, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793

23. Gary Yabuta, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

24. Milton Arakawa, Director
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawaii 96793

25. Cheryl Okuma, Director
County of Maui
Department of Environmental Management
One Main Plaza
2200 Main Street, Suite 100
Wailuku, Hawaii 96793

26. Donald Medeiros, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793

27. Jeffrey Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

28. Greg Kauhi, Manager – Customer Operations
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawaii 96733

29. **Oceanic Time Warner Cable**
350 Hoohana Street
Kahului, Hawaii 96733

30. **Hawaiian Telcom**
60 South Church Street
Wailuku, Hawaii 96793

31. **Pukalani Community Association**
P. O. Box 880323
Pukalani, Hawaii 96768

32. **Pukalani Country Club Golf Course**
360 Pukalani Street
Pukalani, Hawaii 96768

33. **Kulamalu Homeowners Association**
c/o Maui Land Broker and Property Management
The Pono Center
62 N. Market Street, Suite 303
Wailuku, Hawaii 96793

MAR 22 2010

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

March 18, 2010

Regulatory Branch

File No. POH-2010-00051

Munekiyo & Hiraga, Inc.
Attention: Leilani Pulmano
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Pulmano:

We have received your request for the Department of the Army to review and comment on the proposed Pulelehuakea Subdivision, Pukalani, Maui, Hawaii. We have assigned the project the reference number POH-2010-00051. Please cite the reference number in any correspondence with us concerning this project. I have completed my review of the submitted document and have the following comments:

Section 10 of the Rivers and Harbors Act (Section 10) of 1899 requires that a Department of the Army (DA) permit be obtained from the U.S. Army Corps of Engineers (Corps) prior to undertaking any construction, dredging, and other activities occurring in, over, or under navigable waters of the U.S. Section 404 of the Clean Water Act (Section 404) of 1972 (33 U.S.C. 1344) requires that a DA permit be obtained for the discharge (placement) of dredge and/or fill material into waters of the U.S., including wetlands.

Based on our review of the information provided, it appears that no navigable waters of the U.S. are present within the project area. As such, authorization under Section 10 of the Rivers and Harbors Act does not appear to be required for the proposed project. The Corps does not have sufficient information to determine if there are waters of the U.S. present at the project site or if such waters are proposed for impact, which may require authorization under Section 404 of the Clean Water Act.

According to the document submitted, there may be several gulches on or near the project site. No other information regarding the presence or absence of other waters, including drainage ditches or wetlands, is included. When developing the Environmental Assessment, we recommend you include any information regarding any potential waterbody on-site if it may be impacted by the proposed project. Only the Corps of Engineers has authority to determine if any of these features are or are not waters of the U.S. and, potentially subject to regulations under Section 404 of the Clean Water Act.

We encourage the landowner (or the applicant who can demonstrate landowner authorization) to submit a request for a jurisdictional determination for any potential waterbodies. The request should include the aquatic features proposed for impact, flow duration of each feature, and the flow path of each feature into navigable waters. For instance: the unnamed ditch contains flow for two consecutive weeks annually and, from the project impact

site, flows for 800 linear feet before discharging into XYZ Stream. XYZ Stream flows year-round and flows 1,200 feet before discharging into the Pacific Ocean. For wetlands, a delineation conducted in accordance with the Corps of Engineers 1987 Wetland Delineation Manual, should be submitted. We recommend they also include a vicinity map, map of the drainage features and flow paths, and site photographs so the Corps may conduct a jurisdictional determination.

If any of these waterbodies are determined to be waters of the U.S., the applicant will need to obtain authorization from the Corps prior to discharging dredge or fill material into these waterbodies. Fill material may include, but is not limited to: rock, dirt, sand, sandbags, concrete, piping a water of the U.S., or diverting a water of the U.S. into a pipe. Fill can be temporary or permanent. The applicant should contact the Corps to determine if any of the proposed work constitutes a "discharge of fill" and submit an application as necessary. The Corps will then review the application to ensure it complies with all necessary federal laws and is within the public interest. If the fill results in the loss of waters of the U.S. or the waterbodies' associated functions, the applicant may be required to provide compensatory mitigation for any unavoidable impacts. A jurisdictional determination request can be submitted prior to or concurrently with an application.

Please note that you requested comments by March 15, 2010. The Corps of Engineers does not have a timeline for responding to pre-application requests although our goal is to do so in as timely a manner as possible. We recommend you allot a minimum of 30 days, although additional time could be needed, for our agency to submit comments as that goal is more likely to be achieved than 15 days (letter received March 1, 2010). Thank you for contacting us regarding this project and providing us with the opportunity to comment. Should you have any questions, please contact Ms. Amy Klein at (808) 438-7023 or via email at Amy.S.Klein@usace.army.mil.

Sincerely,

for George P. Young, P.E.
Chief, Regulatory Branch

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

George Young, P.E.
Chief, Regulatory Branch
Department of Army
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawaii 96858

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii, POH-2010-00051

Dear Mr. Young:

Thank you for your letter, dated March 18, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

There are no gulches on the project site. There are no drainage ditches and wetlands on or nearby the project site. There is a gulch nearby the project site called Kaluapulani Gulch. The Draft Environmental Assessment (EA) will discuss any potential project impacts to the Kaluapulani Gulch.

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at (808) 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
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MAR 18 2010

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

SANDRA L. YAHIRO
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

MAR 17 2010

(P)1060.0

Ms. Leilani Pulmano, Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Pulmano:

Subject: Early Consultation Request for the proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2)2-3-008:036(portion) Pukalani, Maui, Hawaii

Thank you for the opportunity to provide comments for Early Consultation on the proposed Pulelehuakea Residential Subdivision and Related Improvements, Pukalani, Maui, Hawaii. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or have your staff call Mr. Clarence Kubo of the Public Works Division at 586-0488.

Sincerely,

RUSS K. SAITO
State Comptroller

MAR 10 2010

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME LEINAALA FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD / WB
LUD-M2 3 008 036
Pulelehuakea Res Subd
ID#344

March 8, 2010

Ms. Leilani Pulmano, Project Manager
Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku, Hawaii 96793

Dear Ms. Pulmano:

Subject: Early Consultation Request for the Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008: 036 (portion), Pukalani, Maui, Hawaii (approx. address: Liholani Street, Makawao 96768)

Thank you for allowing us the opportunity to review the above subject project which is proposing to develop a residential subdivision and related on-site and off-site improvements on approximately 6.003 acres of land. We have the following comments and information on the above subject property:

The subject project is located in the Critical Wastewater Disposal Area as determined by the Maui County Wastewater Advisory Committee. No new cesspools are allowed in the area.

Domestic wastewater treatment and disposal have not been addressed in this early consultation request, therefore we can not offer any substantial comments until treatment disposal have been determined. If possible, we highly recommend that the proposed project connects to the Pukalani Wastewater Treatment Plant to serve their wastewater needs. Otherwise, all wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules.

We further recommend the developer utilize recycled water for irrigation and other non-potable water purposes such as parks, golf courses and other open spaces or landscaping areas. And, any means to reduce green house gas emissions, practice renewable energy and reduce waste is highly recommended.

Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at (808) 586-4294.

Sincerely,

SINA PRUDER, P.E., ACTING CHIEF
Wastewater Branch

c: City & County of Honolulu, Mr. Jeff Lee
DOH's Environmental Planning Office (EPO 1-3081)
DOH-WWB's Maui Staff – Mr. Roland Tejano

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Sina Pruder, P.E., Acting Chief
Department of Health
State of Hawaii
Wastewater Branch
P.O. Box 3378
Honolulu, Hawaii 96801

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii, LUD-M23008036, ID# 344

Dear Ms. Pruder:

Thank you for your letter, dated March 8, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

We acknowledge that the project site is located in the Critical Wastewater Disposal Area as determined by the Maui County Wastewater Advisory Committee; and that no new cesspools are allowed in the area.

The Draft Environmental Assessment (EA) will address the wastewater requirements for the project. The applicant is working with the Pukalani Wastewater Treatment Plant to provide service to the proposed project. We, further acknowledge that the wastewater plans must conform to the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems" and that the Department reserves the right to review the wastewater plans.

The Pukalani Country Club Golf Course utilizes all of the R-1 water from the Pukalani Wastewater Treatment Plant. Unfortunately, R-1 water is not available for the proposed subdivision.

The Draft EA will include a discussion on reduction of green house gas emission, renewable energy, and reduction of waste.

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at (808) 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
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MAR 12 2010

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

March 11, 2010

Ms. Leilani Pulmano
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai`i 96793

Dear Ms. Pulmano:

Subject: Early Consultation Request for the proposed Pulelehuakea Residential Subdivision and Related Improvements Pukalani, Maui, Hawaii
TMK: (2) 2-3-008:036 (portion)

Thank you for the opportunity to comment on the early consultation. The following comments are offered:

1. National Pollutant Discharge Elimination System (NPDES) permit coverage may be required for this project. The Clean Water Branch should be contacted at 808 586-4309.

2. The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules, Chapter 11-46 "Community Noise Control". A noise permit may be required and should be obtained before the commencement of this project.

It is strongly recommended that the Standard Comments found at the Department's website: http://hawaii.gov/health/environmental/env-planning/landuse/landuse.html be reviewed, and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please call me at 808 984-8230 or e-mail me at patricia.kitkowski@doh.hawaii.gov.

Sincerely,

Patti Kitkowski

Patti Kitkowski
Acting District Environmental Health Program Chief

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Patti Kitkowski
Acting District Environment Health Program Chief
State of Hawaii
Department of Health – Maui District Office
54 High Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Ms. Kitkowski:

Thank you for your letter, dated March 11, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

1. The project engineer will coordinate with the Clean Water Branch if a National Pollutant Discharge Elimination System (NPDES) permit is required.

2. We understand that a noise permit should be obtained prior to construction if a noise permit is required for the construction phase of the project.

3. Standard comments that apply to the proposed project will be reviewed and addressed as part of the Draft Environmental Assessment.

We appreciate the input provided by your organization. A copy of the Draft Environmental Assessment will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
F:\DATA\KG Holdings\Pukalani36\DOHMauiecIresp.ltr.doc

MAR 16 2010

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 15, 2010

Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku, Hawaii 96793

Attention: Ms. Leilani Pulmano
Project Manager

Ladies and Gentlemen:

Subject: Early Consultation for Proposed Pulelehuakea Residential Subdivision and Related Improvements

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

Other than the comments from Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 2, 2010

MEMORANDUM

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

FROM: for Morris M. Atta Malene
SUBJECT: Early consultation for Proposed Pulelehuakea Residential Subdivision and Related Improvements
LOCATION: Island of Maui
APPLICANT: Munekiyo & Hiraga, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by March 10, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: _____
Date: 3/10/10

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LDMorrisAtta
RE: PreConPulelehuakeaSubdivision
Maui.501

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

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

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

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

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

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

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

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

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

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

( ) Additional Comments: _____

_____

( ) Other: _____

_____

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

Signed: _____
CARTY S. CHANG, ACTING CHIEF ENGINEER

Date: 3/9/10

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Morris M. Atta, Administrator
Department of Land and Natural Resources
Land Division
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Mr. Atta:

Thank you for your letter, dated March 15, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comment noted in the letter from Engineering Division.

Thank you for confirming that the project site is located in Flood Zone X according to the Flood Insurance Rate Map (FIRM). We understand that the Flood Insurance Program does not have any regulations for developments within Flood Zone X.

We appreciate the input provided by your organization. A copy of the Draft Environmental Assessment (EA) will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at (808) 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
F:\DATA\KG Holdings\Pukalani36\DLNRecIresp.ltr.doc

MAR 18 2010

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD10/4856

March 12, 2010

Leilani Pulmano, Project Manager
Munekiyo&Hiraga, Inc.
305 High Street, Suite 104
Wailuku Hawai'i 96793

RE: Pre-Draft Environmental Assessment consultation
Proposed Pulelehua residential subdivision and related improvements
Pukalani, Island of Maui
Tax Map Key: (2) 2-3-008:036 (por.)

Aloha e Leilani Pulmano,

The Office of Hawaiian Affairs (OHA) is in receipt of your February 25, 2010 letter initiating consultation ahead of a draft environmental assessment (draft EA) to facilitate a proposed Makawao-Pukalani-Kula Community Plan Amendment (CPA) and Change in Zoning (CIZ) applications. The draft EA will address two actions being proposed and/or considered by the landowner of the above mentioned tax map key parcel, KG Maui Development, LLC: 1) a CPA and CIZ application to enable the development of the proposed Pulelehuakea single-family residential development; and 2) a CPA and CIZ application for existing residential zoned lands within the adjoining Pukalani Country Club Golf Course.

The proposed Pulelehuakea residential development will occur on approximately 6.003 acres of land situated between holes 5, 6 and 7 of the existing Pukalani Country Club Golf Course. Thirteen single-family residential lots ranging in size from 15,000 to 37,000 square feet will be developed along with utilities and improvements. The changes that will be requested by the CPA and CIZ applications are detailed in "Table 1" included with your letter.

KG Maui Development, LLC is also considering CPA and CIZ applications for lands that are currently zoned residential and situated within the existing Pukalani Country Club Golf Course. As detailed within your letter, this proposed action will *"...ensure long-term viability of the Pukalani Country Club Golf Course by establishing land use designation consistency"*. The considered changes are detailed in "Table 2" included with your letter.

OHA advocates that a comprehensive review of cultural and archaeological studies related to the proposed Pulelehuakea subdivision project area be conducted to determine whether an archaeological inventory survey is warranted.

Thank you for initiating consultation at this early stage and we look forward to the opportunity to review the draft EA and provide additional comments at that time. Should you have any questions, please contact Keola Lindsey, Lead Advocate-Culture at 594-1904 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

C: OHA-Maui Community Resources Coordinator

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Clyde Nāmu`o
Chief Executive Officer
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Mr. Nāmu`o:

Thank you for your letter, dated March 12, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

Cultural and archaeological studies will be completed for the proposed project site and will be included in the Draft Environmental Assessment (EA) for your future review.

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at (808) 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
F:\DATA\KG Holdings\Pukalani36\OHAeclresp.ltr.doc

APR 13 2010

CHARMAINE TAVARES
Mayor

CHERYL K. OKUMA, Esq.
Director

GREGG KRESGE
Deputy Director

TRACY TAKAMINE, P.E.
Solid Waste Division

DAVID TAYLOR, P.E.
Wastewater Reclamation
Division

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

April 9, 2010

Ms. Leilani Pulmano
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Pulmano,

SUBJECT: **PULELEHUAKEA RESIDENTIAL SUBDIVISION**
EARLY CONSULTATION
TMK (2) 2-3-008:036, PUKALANI

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:

   a. None.

2. Wastewater Reclamation Division (WWRD) comments:

   a. None. There is no County sewer system in the area of the subject property.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

Cheryl K. Okuma, Director

CHARMAINE TAVARES
MAYOR

JEFFREY A. MURRAY
CHIEF

ROBERT M. SHIMADA
DEPUTY CHIEF

MAR 09 2010

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY
FIRE PREVENTION BUREAU
313 MANEA PLACE
~~780 ALUA STREET~~
WAILUKU, HAWAII 96793
(808) 244-9161
FAX (808) 244-1363

March 5, 2010

Munekiyo & Hiraga, Inc.
Attn: Leilani Pulmano
305 High Street, Suite 104
Wailuku, HI 96793

Subject: **Early Consultation Request**
Proposed Pulelehuakea Subdivision and Related Improvements
Pukalani
TMK: (2) 2-3-008:036

Thank you for the opportunity to comment on this subject. The Fire Prevention Bureau will address the Pulelehua subdivision, Area "A", during the subdivision process. The requirements for road and water supply for fire protection improvements for single-family subdivisions as stated in 16.04B 140 subsection 903.4.2 shall be applied.

Regarding the downsizing of Area "B", there are no objections or comments to this proposed change. This area shall be accessed and served by the improvements for Area "A".

If you have any questions, you may call me at 244-9161 ext. 23 or fax at 244-1363.

Sincerely,

Captain Paul Haake
Fire Prevention Bureau

20

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Chief Jeff Murray
County of Maui
Department of Fire & Public Safety
200 Dairy Road
Kahului, Hawaii 96732

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Chief Murray:

Thank you for your letter, dated March 5, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

The applicant acknowledges that the Fire Prevention Bureau will review and address the requirements for road and water supply for fire protection improvements during the subdivision process.

We also acknowledge that you have no objections or comments to the downzoning of the golf course area. We would like to clarify that there will be no changes to this golf course area. Thus, fire protection review will likely not be required.

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
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DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

CHARMAINE TAVARES
Mayor

LORI TSUHAKO
Director

JO-ANN T. RIDAO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

MAR 15 2010

March 11, 2010

Munekiyo & Hiraga, Inc.
Attention: Leilani Pulmano
Project Manager
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Pulmano:

SUBJECT: EARLY CONSULTATION REQUEST FOR THE PROPOSED PULELEHUAKEA RESIDENTIAL SUBDIVISION AND RELATED IMPROVEMENTS AT TMK (2)2-3-008:036 POR, PUKALANI, MAUI, HAWAII

Thank you for the opportunity to review and comment on the Early Consultation Request for the above subject subdivision. Based on our review we would like to offer the following comments:

1. The subject project is subject to Chapter 2.96, Maui County Code (MCC), Residential Workforce Housing Policy.

2. KG Maui Development, LLC (KG) is proposing to subdivide one (1) existing lot into thirteen (13) residential lots which will result in twelve (12) new lots.

   If more than 50% of the residential lots are offered for sale for more than $600,000, then KG will be required to provide six (6) (50% x 12) residential workforce housing lots to the income groups specified in Section 2.96.060 of MCC, regardless if the residential workforce housing lots are provided on or off-site of the subject project .

   If more than 50% of the residential lots are offered for sale for less than $600,000, then the KG will be required to provide six (6) (50% x 12) residential workforce housing lots to the income groups specified in Section 2.96.060 MCC, if the residential workforce housing lots are provided off-site of the subject project or provide three (3) (25% x 12) residential workforce housing lots to the income groups specified in Section 2.96.060 of MCC, if the residential lots are provided on-site of the subject project.

As a guide the sales price for the residential workforce housing lots will be based on 50% of the total sales price for a housing and lot package listed in the County of Maui's Affordable Sales Price Guidelines for the applicable target income group and at the prevailing interest rate at the time the lots are marketed for sale.

3. The Residential Workforce Housing Agreement for the subject project needs to be fully executed and recorded at the Bureau of Conveyances prior to final subdivision or building permit approval, whichever occurs first.

4. A development subject to a change in zoning condition that requires affordable or residential workforce housing is exempt from Chapter 2.96 MCC, unless the condition expressly allows for the application of the affordable housing or residential workforce housing policy set forth in Chapter 2.96.

Should you have any questions please call Ms. Cara Bohne at (808) 270-5748.

Sincerely

Wayde T. Oshiro

WAYDE T. OSHIRO
Housing Administrator

cc Director Housing and Human Concerns

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Wayde Oshiro, Housing Administrator
Department of Housing and Human Concerns
County of Maui
35 Lunalilo Street, Suite 102
Wailuku, Hawaii 96793

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Mr. Oshiro:

Thank you for your letter, dated March 11, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

1. The applicant acknowledges that the proposed project is subject to Chapter 2.96, Maui County Code (MCC) Residential Workforce Housing Policy.

2. The applicant also acknowledges the requirements to provide residential workforce housing lots depending on the sales price of lots and if the residential workforce housing lots will be provided on or off-site.

3. A Residential Workforce Housing Agreement for the proposed project will be fully executed and recorded at the Bureau of Conveyances prior to final subdivision or building permit approval, whichever occurs first.

4. The proposed project is not subject to a change in zoning condition that requires affordable or residential workforce housing, thus the proposed project must comply with Chapter 2.96, MCC.

We appreciate the input provided by your organization. A copy of the Draft Environmental Assessment will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
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CHARMAINE TAVARES
Mayor

TAMARA HORCAJO
Director

ZACHARY Z. HELM
Deputy Director

(808) 270-7230
Fax (808) 270-7934

MAR 18 2010

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

March 12, 2010

Leilani Pulmano, Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

RE: **Early Consultation Request for the proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036 (portion), Pukalani, Maui, Hawaii**

Dear Ms. Pulmano:

Thank you for the opportunity to review and provide early comment on the Pulelehuakea Residential Subdivision and related improvements in Pukalani.

Upon review of the submitted documents, we have no comment to offer at this time. We would however appreciate being kept apprized of the project as it develops.

Should you have any questions or need of additional information, please feel free to contract me, or Patrick Matsui, Chief of Parks Planning & Development at 808.270.7931.

Sincerely,

TAMARA HORCAJO
Director of Parks and Recreation

c: Patrick Matsui, Chief of Parks Planning & Development
Willard Asato, East Maui District Supervisor

TH:PTM:rh

CHARMAINE TAVARES
Mayor

JEFFREY S. HUNT
Director

KATHLEEN ROSS AOKI
Deputy Director

APR 0 7 2010

COUNTY OF MAUI
DEPARTMENT OF PLANNING

April 5, 2010

Ms. Leilani Pulmano, Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Pulmano:

SUBJECT: PRE-CONSULTATION COMMENTS REGARDING THE PROPOSED PULELEHUAKEA RESIDENTIAL SUBDIVISION AND RELATED IMPROVEMENTS, PUKALANI, MAUI, HAWAII; TMK: (2) 2-3-008:036 (POR.) (RFC 2010/0025)

The Department of Planning (Department) has reviewed your letter dated February 25, 2010, requesting pre-consultation comments in preparation of the Draft Environmental Assessment (EA).

The Department has no substantive comment at this time. The Department encourages the Applicant to meet with the immediate affected community to provide them the opportunity to comment on the proposed action and include said comments in the Draft EA.

If you require further clarification, please contact Staff Planner Gina Flammer by email at gina.flammer@mauicounty.gov or by phone at 270-5780.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for JEFFREY S. HUNT, AICP
Planning Director

xc: Gina M. Flammer, Staff Planner
Michael Miyamoto, Deputy Director, Department of Public Works
Project File
General File

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MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Kathleen R. Aoki, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Ms. Aoki:

Thank you for your letter, dated April 5, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

We have had several meetings with the surrounding neighbors including a community informational meeting on January 21, 2010. Invitees were owners within 500 feet of the project's Tax Map Key parcel plus several community associations and organizations within the surrounding area. Since that initial meeting, we have had several follow up meetings with Kulamalu Homeowners Association Board and Subcommittees to work out mutually agreeable solutions to their concerns of the proposed project. As indicated in your letter, we will summarize the communities' comments in the Draft Environmental Assessment (EA).

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at (808) 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
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CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

March 17, 2010

Ms. Leilani Pulmano
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Ms. Pulmano:

SUBJECT: EARLY CONSULTATION REQUEST FOR PULELEHUAKEA RESIDENTIAL SUBDIVISION, PUKALANI, MAUI, HAWAII TMK: (2) 2-3-008:036

We reviewed your early consultation request and have no comments to offer at this time.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,

MILTON M. ARAKAWA, A.I.C.P.
Director of Public Works

MMA:MMM:jc
xc: Highways Division
Engineering Division
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MAR 0 5 2010

CHARMAINE TAVARES
MAYOR

DON A. MEDEIROS
Director
WAYNE A. BOTEILHO
Deputy Director
Telephone (808) 270-7511
Facsimile (808) 270-7505

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

March 3, 2010

Ms. Leilani Pulmano
Munekiyo & Hiraga Inc.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Subject: Early Consultation Request for the Pulelehuakea Residential Subdivision in Pukalani

Dear Ms. Pulmano,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,

Don Medeiros
Director

CHARMAINE TAVARES
Mayor

JEFFREY K. ENG
Director

ERIC H. YAMASHIGE, P.E., L.S.
Deputy Director

MAR 24 2010

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

March 19, 2010

Munekiyo & Hiraga, Inc.
Attention: Leilani Pulmano, Project Manager
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Pulmano:

RE: Project Name: Proposed Pulelehuakea Residential Subdivision
Applicant: KG Maui Development, LLC
Permit Name: Early Consultation Request
TMK: (2) 2-3-008:036 por. (Pukalani, Maui, Hawaii)

Thank you for the opportunity to comment on this early consultation request.

The following are our comments based on the provided information. Further comments may be made when this application is formally submitted.

Source Availability and Consumption
The project site (site) is served by the Makawao system.

The site is located in an area affected by the finding of inadequate water supply issued on March 16, 1993. The area has insufficient water supply developed for fire protection, domestic and irrigation purposes to take on new or additional services without the detriment to those already in the regulated area. The EA should, therefore, identify sources and potable/non-potable demand for this project.

The site for the proposed subdivision does not have water meters. Further, the applicant for the site is not on the current Upcountry Water Service or priority list. The applicant will have to develop the source, purchase source credits, or apply to have the site property on the priority list.

System Infrastructure
The site is served by a 12-inch waterline fronting the west end of the property on Liholani Street and a 12-inch waterline close to the south end of the property on Aina

Lani Drive. There are two fire hydrants on Aina Lani Drive which are approximately 100 feet from the project site. However, related water system improvements will be required. During the subdivision approval process, the applicant's plans for water system improvements will be reviewed and approved by our Engineering Division.

During the building permit process, the applicant will be required to submit domestic, irrigation and fire flow calculations to determine water meter capacity and adequate fire protection. Approved fire flow calculation methods currently used by the Department of Water Supply are the "Guidance for Determination of Required Fire Flow" as published by the Insurance Services Office in 1974, 2001 and 2006, or "Fire Flow" as published by the Hawaii Insurance Bureau in 1991.

Storage is provided by the 0.85 million gallon Pukalani Terrace tank southeast of the site.

Pollution Prevention
The site overlies the Makawao aquifer which has a sustainable yield of 7 million gallons per day. The Department of Water Supply's goal is to protect the integrity of surface and groundwater resources. To achieve this, mitigation measures must be implemented to prevent any water pollution related impacts. Best management practices for construction should, therefore, be applied; these are attached to this letter.

Conservation Measures
The Department of Water Supply (DWS) encourages the applicant to consider the following conservation measures in the project design, as well as during construction:

1. Utilize reclaimed or non-potable water for dust control, irrigation and other non-potable uses.
2. Water after 7:00 p.m. at night and before 10:00 a.m. in the morning.
3. Utilize low-flow fixtures and devices - Maui County Code Subsection 16.20A.680 requires the use of low-flow fixtures and devices in faucets, showerheads, urinals, water closets and hose bibs. Even more efficient and consumer tested models are available. Check WaterSense listings at http://www.epa.gov/watersense/pp/index.htm for efficient fixture listings when buying or replacing fixtures.
4. Prevent over-Watering by automated systems - Provide rain-sensors on all automated irrigation controllers. Check and reset controllers at least once a month to reflect the monthly changes in evaporation rates at the site. As an alternative, provide more automated, soil-moisture sensors on controllers.
5. Maintain fixtures to prevent leaks - A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons per day.

6. Limit irrigated turf - Low-water use shrubs and ground cover can be equally attractive and require substantially less water than turf.
7. Select climate adapted native plant species for landscaping - Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species.
8. Look for opportunities to conserve water - Here are a few samples: 1) When clearing debris, use a broom instead of a hose and water; 2) Check for leaks in pipes, faucets and toilets.

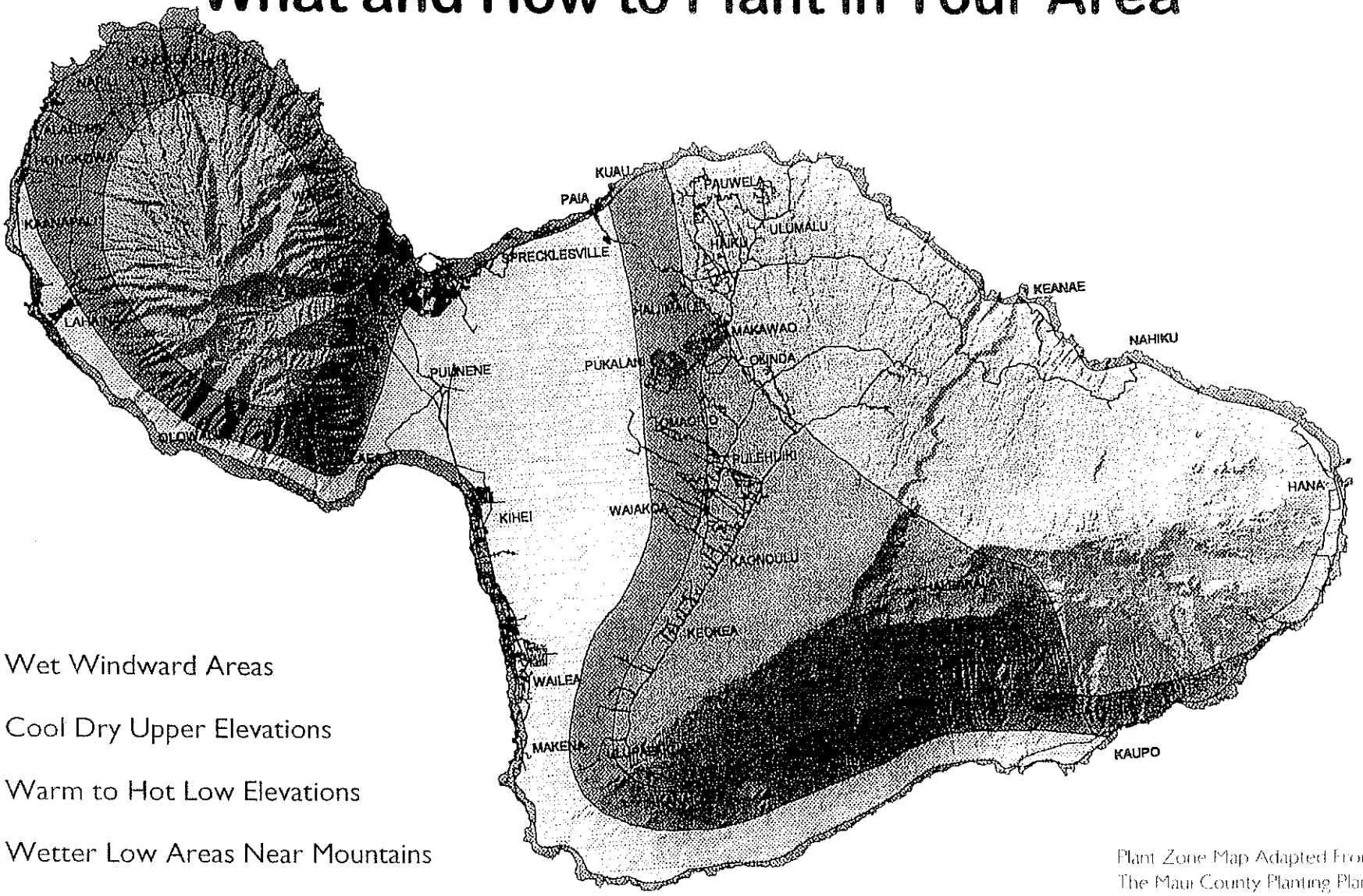
Should you have any questions, please contact our Water Resources & Planning Division at 244-8550.

Sincerely,

JEFFREY K. ENG, DIRECTOR
ayi
Enclosures: Maui County Planting Plan - Saving Water in the Yard - What and How to Plant in your Area
Best Management Practices
c: DWS Engineering Division
WRPD Project File

Saving Water in The Yard

What and How to Plant in Your Area



1 Wet Windward Areas

2 Cool Dry Upper Elevations

3 Warm to Hot Low Elevations

4 Wetter Low Areas Near Mountains

5 Windward Coastal Salt Spray Zones

Plant Zone Map Adapted From
The Maui County Planting Plan

Tips From The Maui County Department of Water Supply

By Water All Things Find Life

Zone-specific Native and Polynesian plants for Maui County

Zone 1

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia arecina	lo'ulu, hawane	40'	10'	1,000' to 3,000'	Dry to Wet
P	Pritchardia forbesiana	lo'ulu	15'			
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Cordyline fruticosa	ti, ki	6			
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Charpentiera obovata		15'			
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 2

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia mauiensis var. diffusa	Maui wormwood, 'ahinahina	2'	3'	1,000' to higher	Dry to Medium
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Charpentiera obovata		15'			
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 2

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Sophora chrysophylla	mamane	15'	15'	1,000' to 3,000'	Medium
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
Gr - Sh	Lycium sandwicense	'ohelo-kai, 'ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Nesoluma polynesicum	keahi	15'	15'	sea to 3,00'	Dry
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Reynoldsia sandwicensis	'ohe makai	20'	20'	1,000' to 3,000'	Dry
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 4

TYPE: F Fern G Grass Gr Ground Cover Sh Shrub P Palm S Sedge Tr Tree V Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia arecina	lo'ulu, hawane	40'	10'	1,000' to 3,000'	Dry to Wet
P	Pritchardia forbesiana	lo'ulu	15'			
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia australis	'ahinahina	2'	3'	sea to 3,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 4

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Artemisia mauiensis var. diffusa	Maui wormwood, 'ahinahina	2'	3'	1,000' to higher	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Cordyline fruticosa	ti, ki	6			
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Charpentiera obovata		15'			
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 4

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Sophora chrysophylla	mamane	15'	15'	1,000' to 3,000'	Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 5

TYPE: F Fern G Grass Gr Ground Cover Sh Shrub P Palm S Sedge Tr Tree V Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lycium sandwicense	'ohelo-kai, ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia australis	'ahinahina	2'	3'	sea to 3,000'	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	8'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 5

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, aluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh-Tr	Dodonaea viscosa	a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	80'	40'	sea to 3,000'	Medium to Wet
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet
V	Ipomoea pes-caprae	beach morning glory, pohuehue	1			

DO NOT PLANT THESE PLANTS !!!

Common name	Scientific name	Plant family
black wattle	Acacia mearnsii	Mimosaceae
blackberry	Rubus argutus	Rosaceae
blue gum	Eucalyptus globulus	Myrtaceae
bocconia	Bocconia frutescens	Papaveraceae
broad-leaved cordia	Cordia glabra	Boraginaceae
broomsedge, yellow bluestem	Andropogon virginicus	Poaceae
buffelgrass	Cenchrus ciliaris	Poaceae
butterfly bush, smoke bush	Buddleja madagascariensis	Buddlejaceae
cats claw, Mysore thorn, wait-a-bit	Caesalpinia decapetala	Caesalpiniaceae
common ironwood	Casuarina equisetifolia	Casuarinaceae
common velvet grass, Yorkshire fog	Holcus lanatus	Poaceae
fiddlewood	Citharexylum spinosum	Verbenaceae
fire tree, faya tree	Myrica faya	Myricaceae
glorybower	Clerodendrum laponicum	Verbenaceae
hairy cat's ear, gosmore	Hypochoeris radicata	Asteraceae
haole koa	Leucaena leucocephala	Fabaceae
ivy gourd, scarlet-fruited gourd	Coccinia grandis	Cucurbitaceae
juniper berry	Citharexylum caudatum	Verbenaceae
kahili flower	Grevillea banksii	Proteaceae
klu, popinac	Acacia farnesiana	Mimosaceae
logwood, bloodwood tree	Haematoxylon campechianum	Caesalpiniaceae
loquat	Eriobotrya japonica	Rosaceae
meadow ricegrass	Ehrharta stipoides	Poaceae
melaleuca	Melaleuca quinquenervia	Myrtaceae
miconia, velvet leaf	Miconia calvescens	Melastomataceae
narrow-leaved carpetgrass	Axonopus fissifolius	Poaceae
oleaster	Elaeagnus umbellata	Elaeagnaceae
oriental mangrove	Bruguiera gymnorrhiza	Rhizophoraceae
padang cassia	Cinnamomum burmanii	Lauraceae
palmgrass	Setaria palmifolia	Poaceae
pearl flower	Heterocentron subtriplinervium	Melastomataceae
quinine tree	Cinchona pubesens	Rubiaceae
satin leaf, caimitillo	Chrysophyllum oliviforme	Sapotaceae
silkwood, Queensland maple	Flindersia brayleyana	Rutaceae
silky oak, silver oak	Grevillea robusta	Proteaceae
strawberry guava	Psidium cattleianum	Myrtaceae
swamp oak, saltmarsh, longleaf ironwood	Casuarina glauca	Casuarinaceae
sweet vernalgrass	Anthoxanthum odoratum	Poaceae
tree of heaven	Ailanthus altissima	Simaroubaceae
trumpet tree, guarumo	Cecropia obtusifolia	Cecropiaceae
white ginger	Hedychium coronarium	Zingiberaceae
white moho	Heliocarpus popayanensis	Tiliaceae
yellow ginger	Hedychium flavescens	Zingiberaceae

DO NOT PLANT THESE PLANTS !!!

Common name	Scientific name	Plant family
	Jasminum fluminense	Oleaceae
	Arthrostema ciliatum	Melastomataceae
	Dissotis rotundifolia	Melastomataceae
	Erigeron karvinskianus	Asteraceae
	Eucalyptus robusta	Myrtaceae
	Hedychium gardnerianum	Zingiberaceae
	Juncus planifolius	Juncaceae
	Lophostemon confertus	Myrtaceae
	Medinilla cumingii	Melastomataceae
	Medinilla magnifica	Melastomataceae
	Medinilla venosa	Melastomataceae
	Melastoma candidum	Melastomataceae
	Melinis minutiflora	Poaceae
	Olea europaea	
	Oxyspora paniculata	Melastomataceae
	Panicum maximum	Poaceae
	Paspalum urvillei	Poaceae
	Passiflora edulis	Passifloraceae
	Phormium tenax	Agavaceae
	Pinus taeda	Pinaceae
	Prosopis pallida	Fabaceae
	Pterolepis glomerata	Melastomataceae
	Rhodomyrtus tomentosa	Myrtaceae
	Schefflera actinophylla	Araliaceae
	Syzygium jambos	Myrtaceae
Australian blackwood	Acacia melanoxylon	Mimosaceae
Australian tree fern	Cyathea cooperi	Cyatheaceae
Australian tree fern	Sphaeropteris cooperi	Cyatheaceae
Beggar's tick, Spanish needle	Bidens pilosa	Asteraceae
California grass	Brachiaria mutica	Poaceae
Chinese banyon, Maylayan banyon	Ficus mirocarpa	Moraceae
Chinese violet	Asystasia gangetica	Acanthaceae
Christmasberry, Brazilian pepper	Schinus terebinthifolius	Anacardiaceae
Formosan koa	Acacia confusa	Mimosaceae
German ivy	Senecio mikanioides	Asteraceae
Japanese honeysuckle	Lonicera japonica	Caprifoliaceae
Koster's curse	Clidemia hirta	Melastomataceae
Lantana	Lantana camara	Verbenaceae
Mauritius hemp	Furcraea foetida	Agavaceae
Mexican ash, tropical ash	Fraxinus uhdei	Oleaceae
Mexican tulip poppy	Hunnemannia fumariifolia	Papaveraceae
Mules foot, Madagascar tree fern	Angiopteris evecta	Marattiaceae
New Zealand laurel, karakaranut	Corynocarpus laevigatus	Corynocarpaceae
New Zealand tea	Leptospermum scoparium	Myrtaceae
Pampas grass	Cortaderia jubata	Poaceae
Panama rubber tree, Mexican rubber tree	Castilloa elastica	Moraceae
Shoebutton ardisia	Ardisia elliptica	Myrsinaceae
banana poka	Passiflora mollissima	Passifloraceae

Selection

As a general rule, it is best to select the largest and healthiest specimens. However, be sure to note that they are not pot-bound. Smaller, younger plants may result in a low rate of plant survival.[1] When selecting native species, consider the site they are to be planted in, and the space that you have to plant. For example: Mountain species such as koa and maile will not grow well in hot coastal areas exposed to strong ocean breezes. Lowland and coastal species such as wiliwili and Kou require abundant sunshine and porus soil. They will not grow well with frequent cloud cover, high rainfall and heavy soil.

Consider too, the size that the species will grow to be. It is not wise to plant trees that will grow too large.[2] Overplanting tends to be a big problem in the landscape due to the underestimation of a species' height, width or spread.

A large, dense canopied tree such as the kukui is a good shade tree for a lawn. However, it's canopy size and density of shade will limit what can be planted in the surrounding area. Shade cast by a koa and ohia lehua is relatively light and will not inhibit growth beneath it.

Keep seasons in mind when you are selecting your plants. Not all plants look good year round, some plants such as ilima will look scraggly after they have flowered and formed seeds. Avoid planting large areas with only one native plant. Mixing plants which naturally grow together will ensure the garden will look good all year round.[3] Looking at natural habitats helps to show how plants grow naturally in the landscape.

When planting an area with a mixed-ecosystem, keep in mind the size and ecological requirements of each plant. Start with the hardiest and most easily grown species, but allow space for fragile ones in subsequent plantings.

Acquiring natives

Plants in their wild habitat must be protected and maintained. It is best and easiest to get your plants from nurseries (see list), or friend's gardens. Obtain proper permits from landowners and make sure you follow a few common sense rules:

- collect sparingly from each plant or area.
- some plants are on the state or Federal Endangered Species list. Make sure you get permits (see app. A,B)

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[1] K. Nagata, P.6

[2] K. Nagata, P.9

[3] Nagata, P.9

Soil

Once you have selected your site and the plants you wish to establish there, you must look at the soil conditions on the site. Proper soil is necessary for the successful growth of most native plants, which preform poorly in hard pan, clay or adobe soils. If natives are to be planted in these types of soil, it would be wise to dig planting holes several times the size of the rootball and backfill with 50-75% compost.[4] A large planting hole ensures the development of a strong root system. The plant will have a headstart before the roots penetrate the surrounding poor soil.[5]

It is recommended that native plants not be planted in ground that is more dense than potting soil. If there is no alternative, dig a hole in a mound of soil mixed with volcanic cinder which encourages maximum root development. Fill the hole with water, if the water tends to puddle or drain too slowly, dig a deeper hole until the water does not puddle longer than 1 or 2 minutes.[6] Well-drained soil is one of the most important things when planting natives as you will see in the next section.

Irrigation

Most natives do very poorly in waterlogged conditions. Do not water if the soil is damp. Water when the soil is dry and the plants are wilting. Once established, a good soaking twice a week should suffice. Deep soaking encourages the development of stronger, and deeper root systems. This is better than frequent and shallow watering which encourage weaker, more shallow root systems.

The following is a watering schedule from Kenneth Nagata's Booklet, *How To Plant A Native Hawaiian Garden*:

WATER REQUIREMENT	WATERING FREQUENCY
Heavy	3x / week
Moderate	2x / week
Light	1x / week

Red clay soils hold more water for a longer period of time than sandy soils do. If your area is very sunny or near a beach, things will dry out faster. Even in the area of one garden, there are parts that will need more or less water. Soils can vary and amount of shade and wind differ. After plants are established (a month or two for most plants, up to a year for some trees), you can back off watering.

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[4] Nagata, p. 6

[5] Nagata, p. 8

[6] Nagata, p. 8

Automatic sprinkler systems are expensive to install and must be checked and adjusted regularly. Above-ground systems allow you to monitor how much water is being put out, but you lose a lot due to malfunctioning of sprinkler heads and wind. The most efficient way to save water and make sure your plants get enough water, is to hand-water. This way you are getting our precious water to the right places in the right amounts.[7]

Fertilizer

An all-purpose fertilizer 10-10-10 is adequate for most species. They should be applied at planting time, 3 months later, and 6 months thereafter. Use half the dosage recommended for ornamentals and pay special attention to native ferns which are sensitive to strong fertilizers. Use of organic composts and aged animal manures is suggested instead of chemical fertilizers. In addition, use of cinders for providing trace minerals is strongly recommended.[8]

Natives are plants which were here hundreds of years before the polynesians inhabited the Hawaiian Islands. They were brought here by birds, or survived the harsh ocean conditions to float here. They are well-adapted to Hawaii's varying soil and environmental conditions. This is why they make prime specimens for a xeriscape garden. However, natives will not thrive on their own, especially under harsh conditions. On the other hand, like any other plant, if you over-water and over-fertilize them, they will die. Follow the instructions given to you by the nursery you buy the plant from, or from this booklet. Better yet, buy a book (suggested readings can be found in the bibliography in the back of this pamphlet), read it, and learn more about native plants. I guarantee that you will be pleased with the results.

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[7] Bornhorst, p. 19-20

[8] Nagata, p. 6

Propagation

There are many ways to propagate and plant-out native Hawaiian species. One of the most thourough and helpful book is Heidi Bornhorst's book, *Growing Native Hawaiian Plants.* The easiest, and best way to obtain natives for the novice gardener is to get them from a reputable nursery (see appendix c). That way all you will have to do is know how to transplant (if necessary) and plant-out when you are ready. These are the two methods I have listed here.

Transplanting

1. Use pots that are one size bigger than the potted plant is in
2. Get your potting medium ready

Good potting medium is a ½, ½ mixture of peat moss and perlite. If the plant is from a dry or coastal area, add chunks of cinder or extra perlite. If it is a wet forest species, add more peat moss or compost. Be aware that peat moss is very acidic and certain plants react severely to acidity.

If the plant is to eventually be planted into the ground, make a mix of equal parts peat moss, perlite, and soil from the area in which the plant is to be planted. Slow-release fertilizer can be mixed into the potting medium.

3. Once pots, potting medium, fertilizer and water are ready, you can begin re-potting. Keep the plant stem at the same depth it was in the original pot. Avoid putting the plant in too large a pot, as the plant may not be able to soak up all the water in the soil and the roots may drown and rot.

Mix potting medium and add slow-release fertilizer at this time. Pre-wet the medium to keep dust down and lessen shock to the plant. Put medium in bottom of pot. Measure for the correct depth in the new pot. Make sure there is from ½ to 2 inches from the top of the pot so the plant can get adequate water. Try to stand the plant upright and center the stem in the middle of the pot.

Water the plant thoroughly after transplanting. A vitamin B-1 transplanting solution can help to lessen the transplant shock. Keep the plant in the same type of environment as it was before, sun or shade. If roots were broken, trimm off some of the leaves to compensate for the loss.[9]

Planting out

1. Plant most native Hawaiian plants in a sunny location in soil that is well-drained.
2. Make the planting hole twice as wide as the root ball or present pot, and just as deep.

If the soil is clay-like, and drains slowly, mix in some coarse red or bland cinder, coarse perlite or

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[9] Bornhorst, p.20-21

coarse compost. Place some slow-release fertilizer at the bottom of the hole.

3. Carefully remove the plant from the container and place it in the hole.

The top of the soil should be at the same level as the top of the hole, if it is too high or too low, adjust the soil level so that the plant is at the right depth.

4. Water thoroughly after you transplant.

Mulch

Most natives cannot compete with weeds, and therefore must be weeded around constantly in order to thrive. Mulch is a practical alternative, which discourages and prevents weeds from growing.

Hawaii's hot, humid climate leads to the breaking down of organic mulches. Thick organic mulches such as wood chips and leaves, may also be hiding places for pests.

Stone mulches are attractive, permanent and can help to improve soil quality. Red or black cinder, blue rock chips, smooth river rocks and coral chips are some natural choices.[10] Macadamia nut hulls are also easy to find and can make a nice mulch.[11]

Never pile up mulch right next to the stem or trunk of a plant, keep it a few inches away.

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[10] Bornhorst, p. 24

[11] Nagata, p. 7

ZONES

The Maui County Planting Plan has compiled a system of 5 zones of plant growth for Maui County. The descriptions of zones and maps for these zones are as follows:

Zone 1:

Wet areas on the windward side of the island. More than 40 inches of rain per year. Higher than 3,000 feet.

Zone 2:

Cool, dry areas in higher elevations (above 1,000 feet). 20 to 40 inches of rain per year.

Zone 3:

Low, drier areas, warm to hot. Less than 20 inches of rain per year. Sea level to 1,000 feet.

Zone 4:

Lower elevations which are wetter due to proximity of mountains. 1,000 to 3,000 feet.

Zone 5:

Salt spray zones in coastal areas on the windward side.

These zones are to be used as a general guide to planting for Maui County. In addition to looking at the maps, read the descriptions of the zones and decide which zone best fits your area. Plants can be listed in more than one zone and can be planted in a variety of conditions. For best results, take notes on the rainfall, wind, sun and salt conditions of your site. Use the zones as a general guide for selection and read about the plants to decide which best fits your needs as far as care and or function.

PLACES TO SEE NATIVES ON MAUI:

The following places propagate native Hawaiian plants from seeds and/or cuttings. Their purpose is to protect and preserve these native plants. Please contact them before going to view the sites, they can provide valuable information and referral to other sources.

1.	Hoolawa Farms P O Box 731 Haiku HI 96708	575-5099
2.	The Hawaiian Collection 1127 Manu Street Kula HI 96790	878-1701
3.	Kula Botanical Gardens RR4, Box 228 Kula HI 96790	878-1715
4.	Maui Botanical Gardens Kanaloa Avenue, Kahului across from stadium	249-2798
5.	Kula Forest Reserve access road at the end of Waipoli Rd Call the Maui District Office	984-8100
6.	Wailea Point, Private Condominium residence 4000 Wailea Alanui, Kihei public access points at Four Seasons Resort or Polo Beach	875-9557
7.	Kahanu Gardens, National Tropical Botanical Garden Alau Place, Hana HI 96713	248-8912
8.	Kahului Library Courtyard 20 School Street Kahului HI 96732	873-3097

PLACES TO BUY NATIVE PLANTS ON MAUI

1. Ho'olawa Farms
   Anna Palomino
   P O Box 731
   Haiku HI 96708
   575-5099

   * The largest and best collection of natives in the state. They will deliver, but worth the drive to go and see! Will propagate upon request

2. Kahanu Gardens
   National Tropical Botanical Garden
   Alau Place, Hana
   248-8912

3. Kihana Nursery
   1708 South Kihei Road
   Kihei HI 96753
   879-1165

4. Kihei Garden and Landscape
   Waiko Road, Wailuku
   P O Box 1058
   Puunene HI 96784
   244-3804

5. Kula Ace Hardware and Nursery
   3600 Lower Kula Road
   Kula HI 96790
   876-0734
   * many natives in stock
   * get most of their plants from Ho'olawa Farms
   * they take special requests

6. Kulamanu Farms - Ann Carter
   Kula HI 96790
   878-1801

7. Maui Nui Botanical Gardens
   Kanaloa Avenue
   (Across from stadium)
   Kahului HI 96732
   249-2798

8. Native Gardenscapes
   Robin McMillan
   1330 Lower Kimo Drive
   Kula HI 96790
   870-1421

   * grows native plants and installs landscapes including irrigation.

9. Native Hawaiian Tree Source
   1630 Piiholo Road
   Makawao HI 96768
   572-6180

10. Native Nursery, LLC
    Jonathan Keyser
    250-3341

11. New Moon Enterprises - Pat Bily
    47 Kahoea Place
    Kula HI 96790
    878-2441

12. Waiakoa Tree Farm - Kua Rogoff
    Pukalani HI 96768
    Cell - 264-4166

Construction

- Limit construction to dry periods.

- Prevent cement products, oil, fuel and other toxic substances from falling or leaching into the ground by using proper containment and maintenance practices.
  - Maintain vehicles and equipment to prevent leakage of oil or other fluids.
  - When painting, avoid spilling of paints, calculate needs to avoid wastes, and if spraying, avoid overspray.
  - When maintaining construction vehicles and equipment, use drip pans, absorbant mats, or other methods to prevent leaks or spills of chemicals onto the ground.
  - Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical runoff.
  - Make sure that operators are properly trained, know how to clean equipment properly to avoid contamination, and how to separate hazardous materials for disposal.

- Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.

- Retain ground cover until the last possible date.

- Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments, fertilizers, and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.

- Keep run-off on site.
  - Construct drainage control features, such as berms, install silting basins where warranted.
  - Maintain drainage structures, detention, silting, and debris basins.

- Control dust by proper stockpiling and use non-potable water for dust control.

- Cover open vehicles carrying soils, gravel or other particulate matter.

- Schedule work only during non-peak and non-seasonal time periods to minimize congestion.

- Direct traffic and install traffic signals to ensure safe travel and minimum delay through the project by vehicles, bicyclists, and pedestrians.

- Control noise by use of mufflers and other sound attenuating measures on excavation and other construction equipment.

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Jeffrey Eng, Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Mr. Eng:

Thank you for your letter, dated March 19, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

Source Availability and Consumption

We acknowledge that the project site is located in an area of "inadequate water supply". The Draft Environmental Assessment (EA) will include a discussion on alternative sources of water and the water demand for the project.

We further acknowledge that the proposed subdivision does not have water meters.

System Infrastructure

We understand that during the subdivision approval process, the plans for the project's water system will be reviewed and approved by the Department's Engineering Division.

We also understand that during the building permit process, domestic irrigation and fire flow calculations are required.

Pollution Prevention

Thank you for the list of best management practices for construction to protect the integrity of surface and groundwater resources. We will incorporate these suggestions into the project and the Draft EA.

Conservation Measures

Thank you for the suggestion on conservation measures. The applicant will incorporate these suggestions into the project to the extent practicable.

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
F:\DATA\KG Holdings\Pukalani36\DWSecResp.ltr.doc

CHARMAINE TAVARES
MAYOR

OUR REFERENCE
YOUR REFERENCE

POLICE DEPARTMENT
COUNTY OF MAUI

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

MAR 15 2010

GARY A. YABUTA
CHIEF OF POLICE

CLAYTON N.Y.W. TOM
DEPUTY CHIEF OF POLICE

March 10, 2010

Ms. Leilani Pulmano
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Pulmano:

SUBJECT: Early Consultation Request for the Proposed Pulelehuakea Residential Subdivision and Related Improvements

This is in response to the request for comments on the above subject.

We have reviewed the information submitted for this project and have enclosed a copy of our comments. Thank you for giving us the opportunity to comment on this project.

Very truly yours,

Assistant Chief Danny J. Matsuura
for: Gary A. Yabuta
Chief of Police

c: Jeffrey Hunt, Planning Department

LD

COPY

TO : GARY YABUTA, CHIEF OF POLICE, COUNTY OF MAUI

VIA : CHANNELS

3/3/10

FROM : JODY SINGSANK, CAPTAIN, PATROL DIVISION-WAILUKU DISTRICT

SUBJECT : RESPONSE TO AN EARLY CONSULTATION REQUEST FOR THE PROPOSED PULELEHUAKEA RESIDENTIAL SUBDIVISION AND RELATED IMPROVEMENTS

This communication is submitted as a response to a request for pre-consultation comments by Munekiyo and Hiraga, Inc., Project Manager Leilani Pulmanol, regarding:

SUBJECT : EARLY CONSULTATION REQUEST FOR THE PROPOSED PULELEHUAKEA RESIDENTIAL SUBDIVISION AND RELATED IMPROVEMENTS

RESPONSE:

In review of the submitted documents, concerns from the police perspective are upon the safety of pedestrian and vehicular movement.

This project will develop a residential subdivision on approximately 6.003 acres of land, located between holes 5,6,7 of the Pukalani Golf Course. Access to the proposed project site will be provided via Aina Lani Drive.

The roadway into the project will need to meet the minimal standards set forth by county codes and state laws. A traffic impact study would be the only means to assess the levels of service in current and future conditions. There are no objections to the progression of the project at this time

Respectfully submitted,

Capt J Sing 8467

Capt. Jody K.M. SINGSANK, E-8467
Patrol Division – Wailuku District
03/03/10 1430 hrs.

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Gary Yabuta Chief
County of Maui
Maui Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Chief Yabuta:

Thank you for your letter, dated March 10, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in Captain Jody K.M. Singsank's letter.

The Draft Environmental Assessment (EA) will provide a traffic impact assessment report that addresses the current and future roadway conditions. The internal roadway design will meet the appropriate roadway standards.

We appreciate the input provided by your organization. A copy of the Draft EA will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:lh
cc: Elton Wong, KG Maui Development, LLC
F:\DATA\KG Holdings\Pukalani36\MPDecIresp.ltr.doc

MAR 1 5 2010

Hawaiian Telcom

March 11, 2010

Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

ATTN: Leilani Pulmano, Project Manager

SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED PULELEHUAKEA RESIDENTIAL SUBDIVISION AND RELATED IMPROVEMENTS AT TMK (2) 2-3-008:036 (portion) MAKAWAO, ISLAND OF MAUI
TMK: (2) 2-3-008:036 (portion)
KG MAUI DEVELOPMENT, LLC (applicant)

Dear Ms. Pulmano:

Thank you for providing Hawaiian Telcom Incorporated, the opportunity to comment on the Early Consultation request to seek a Community Plan Amendment (CPA) to the Makawao-Pukalani-Kula community plan's land use map, county Change in Zoning (CIZ) and possible request to downzone the existing residential zoned lands for the proposed Pulelehuakea Residential project for KG Maui Development, in Pukalani, Makawao, on the Island of Maui.

Hawaiian Telcom has no comment on this project at this time.

If there are any questions, please call Sheri Tihada at (808) 242-5258.

Sincerely,

Lynette Yoshida
Senior Manager –
Network Engineering & Planning

C: File (3050 1003-005)
S. Tihada

Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96733-6898 • (808) 871-8461

MAR 0 3 2010

March 2, 2010

Ms. Leilani Pulmano, Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Maui, Hawaii, 96793

Subject: Early Consultation Request for the proposed Pulelehuakea Residential Subdivision and Related Improvements
Pulelehuakea Street
Pukalani, Maui, Hawaii
Tax Map Key: (2) 2-3-008:036 por.

Dear Ms. Pulmano,

Thank you for allowing us to comment on the Early Consultation Request for the subject project.

In reviewing our records and the information received, Maui Electric Company may be requiring access and electrical easements for our facilities to serve the subject project site. We highly encourage the customer to submit an electrical service request so that services can be provided on a timely basis.

Should you have any questions or concerns, please call me at 871-2341.

Sincerely,

Kyle Tamori
Staff Engineer

64

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

July 27, 2010

Kyle Tamori, Staff Engineer
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawaii 96733

SUBJECT: Proposed Pulelehuakea Residential Subdivision and Related Improvements at TMK (2) 2-3-008:036(por.), Pukalani, Maui, Hawaii

Dear Mr. Tamori:

Thank you for your letter, dated March 2, 2010, providing early consultation comments for the proposed Pulelehuakea Residential Subdivision. On behalf of the applicant, KG Maui Development, LLC, we offer the following information in response to the comments noted in your letter.

At the appropriate time in the design and planning process, the applicant will submit an electrical service request to ensure that services can be provided in a timely manner. The applicant also acknowledges that Maui Electric Company, Ltd. may require access and electrical easements for their facilities to serve the proposed project.

We appreciate the input provided by your organization. A copy of the Draft Environmental Assessment will be submitted to your office for review and comment. Should you have any questions or further comments, please contact me at 244-2015.

Sincerely,

Leilani Pulmano
Project Manager

LP:tn
cc: Elton Wong, KG Maui Development, LLC
Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
F:\DATA\KG Holdings\Pukalani36\mecoresp.ltr.doc

X. REFERENCES

X. REFERENCES

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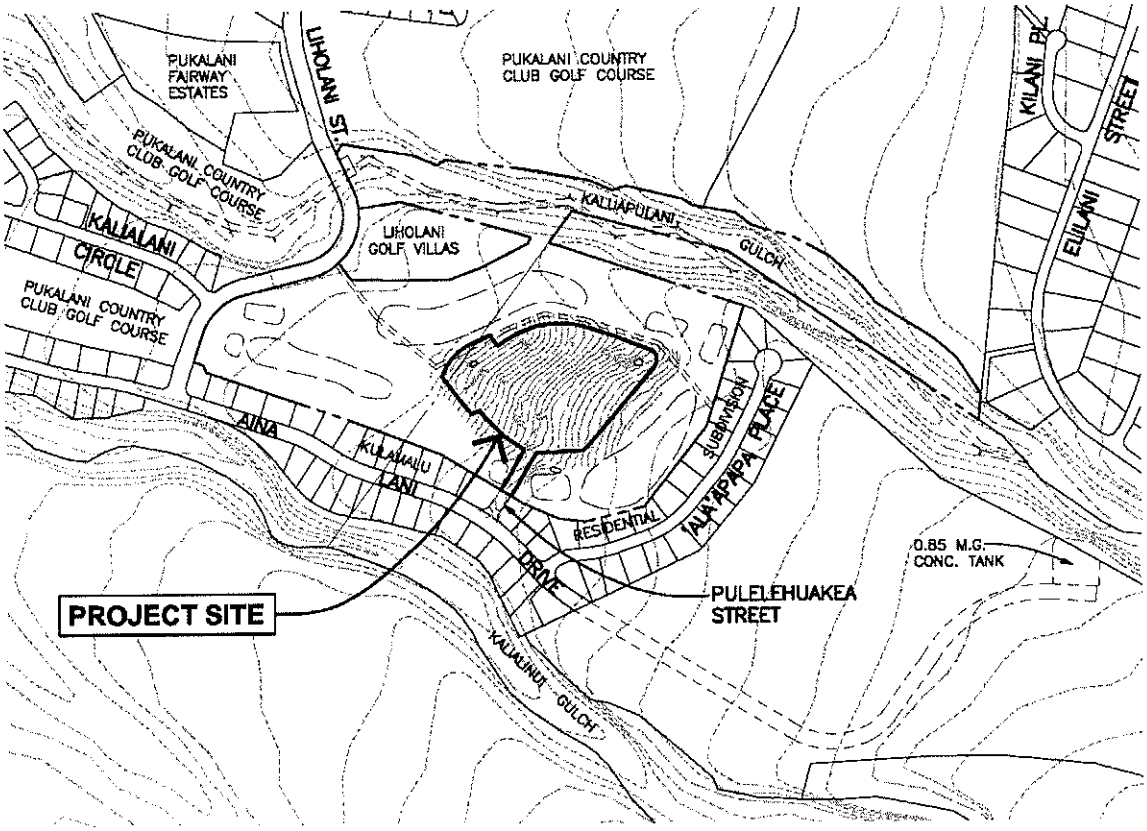
APPENDIX A.

Preliminary Engineering Report

PRELIMINARY ENGINEERING REPORT
For Pulelehuakea Subdivision

Pukalani, Maui, Hawaii
Tax Map Key (2) 2-3-008:036



Project:

Pulelehuakea Subdivision
Pukalani, Maui, Hawaii

Date:

December 11, 2009

Client:

KG Holdings, LLC
1288 Ala Moana Boulevard, Suite 201
Honolulu, Hawaii, 96814
Phone: (808) 525-1508
Fax: (808) 524-0766

Consultant:

Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793
Phone: (808) 242-8611
Fax: (808) 244-7510
E-Mail: office@rfemaui.com

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Appendix

Flood Hazard Assessment Report A-1
Preliminary Drainage Information B-1

I. PURPOSE

The purpose of this report is to evaluate the effects of the project on existing infrastructure for inclusion in an assessment for land use entitlement applications. This report will review the water system, wastewater system, and electrical, telephone, and cable television systems serving the project. This report will also provide an analysis of existing and proposed drainage systems. The drainage analysis will describe existing drainage conditions, present preliminary grading and drainage plans, and provide drainage design information for incorporation into the final designs.

II. PROJECT DESCRIPTION

A. General Location

The project involves an initial subdivision to create a parcel for development of a 13-lot single-family residential subdivision in Pukalani, Maui. The site is a part of the Pukalani Terrace and Country Club development. The initial work consists of subdividing the 6.003-acre development site from a 39.163-acre larger parcel, designated on the tax maps as Tax Map Key (2) 2-3-008:036. The larger parcel includes the development site, surrounding golf holes, and portions of Kaluapulani Gulch. (See Figure 1 – Location Map (USGS Map), page 6; Figure 2 – Vicinity Map (Tax Map), page 7; and Figure 4 – Regional Topographic Map, page 9.)

The development site is surrounded by the 5th, 6th, and 7th golf holes of the Pukalani Country Club Golf Course. Liholani Street adjoins the westerly side of the larger parcel, Kulamalu Residential Subdivision adjoins the southerly and easterly sides of the larger parcel, and Liholani Golf Villas and Kaluapulani Gulch adjoin the northerly side of the larger parcel.

B. Project Components

The project includes construction of on-site and off-site improvements for a 13-lot single-family residential subdivision. Improvements include a 600-foot long T-shaped cul-de-sac street and site improvements. Site improvements include clearing and grubbing, site grading, paving, relocation of a cart path, relocation of a tee box and green, landscape plantings, and site utilities. Site utilities include water, wastewater, drainage, and electrical systems.

III. WATER SYSTEM

The County of Maui provides water service for the area. The water system in the area consists of an 850,000-gallon reservoir and various distribution lines. The 850,000-gallon reservoir located about 1,800 feet southeast of the project, provides storage and supplies the distribution system in the area. Twelve-inch distribution lines transport the water from the reservoir to the service areas. The project will tap into an existing 8-inch

line along Pulelehuakea Street.

Preliminary data indicates that the existing water system can handle the domestic and fire protection demands of this project. The projects anticipated average daily water demand is 7,800 gallons per day, based on 600 gallons per day for each dwelling unit multiplied by 13 units. For single-family residential zoning, the required fire flow, duration, and fire hydrant spacing are 1,000 gallons per minute, 2 hours, and 350 feet, respectively.

Water system improvements for this project include 8-inch water lines, fire hydrants, and service laterals.

IV. WASTEWATER SYSTEM

Hawaii Water Service Company owns and operates the Pukalani Sewerage Treatment Works, a private wastewater collection and treatment facility that serves the Pukalani Terrace and Country Club development. The collection system consists of gravity sewers, force mains, and pump stations. The collection system carries wastewater to the Pukalani Wastewater Treatment Plant for treatment and disposal.

Preliminary data indicates that the existing collection system and treatment facility can handle the wastewater flows produced by this project. The project's anticipated average wastewater flow is 4,550 gallons per day. This total is based on 350 gallons per day for each main dwelling multiplied by 13 units.

Wastewater improvements for this project include off-site and on-site gravity sewers. Improvements consist of 8-inch sewer mains, 6-inch sewer laterals, and manholes. These lines will connect to the existing collection system that runs through the larger parcel.

V. ELECTRICAL, TELEPHONE & CABLE TELEVISION SYSTEMS

Maui Electric Company, Hawaiian Telcom, and Oceanic Time Warner Cable provide electrical, telephone, and cable television service for the area. These utility companies confirmed that services are available for the project. The project will be served by new underground lines that connect to existing nearby facilities. The new electrical system will branch off of the lines that now deliver power to the Kulamalu Residential Subdivision. Similarly, the new telephone system and new cable television system will also branch off of the lines serving the adjoining subdivision.

VI. DRAINAGE SYSTEM

A. Topography

The topographic map shows existing ground contours and improvements of the on-site areas. (See Figure 5 - Topographic Map, page 10). Additional information of the adjoining parcels is shown on the overall topographic map. (See Figure 4 – Regional Topo-

graphic Map, page 9).

The site is undeveloped land with various trees, scrub vegetation, and grasses. The elevations of the site range from about 1,274 feet above mean sea level to 1,220 feet above mean sea level. The site generally slopes down from southeast to northwest. The slopes range from 6 to 12 percent throughout the site.

B. Soil

According to the Soil Conservation Service, the on-site soil is Keahua silty clay, 7 to 15 percent slopes (KncC). The Keahua series consist of well-drained soils on uplands on the island of Maui. The survey characterizes the soil as having a dark reddish-brown silty clay loam surface layer approximately 10 inches thick, moderate permeability, slow to medium runoff, and slight to moderate erosion hazard. (See Figure 3 – Soil Map, page 8.)

C. Flood and Tsunami Hazard

The flood insurance rate map of the area shows there are no flood hazard areas on the site. The flood insurance rate map designates the site as Zone X, an area subject to minimal flooding. (See Appendix A - Flood Hazard Assessment Report.)

D. Existing Drainage Improvements

There are no drainage improvements on the site. Storm runoff sheet flows across the site and through the golf course. Concrete curbs, gutters, and catch basins along Liholani Street collect the storm runoff and direct the collected runoff to Kaluapulani Gulch. (See Figure 6 - Drainage Area Map - Existing, page 11.)

E. Proposed Drainage Improvements

Proposed drainage improvements include swales, catch basins, manholes, drain pipes, a culvert, and a detention/retention (D/R) basin. In general, these improvements will direct off-site runoff around the site and on-site runoff to the D/R basin to mitigate the increase due to the project. (See Figure 8 – Preliminary Grading and Drainage Plan, page 13.)

The existing paved roadway, 'Ala'papa Place, forms the upper limit of the off-site drainage areas. From this upper limit, runoff from portions of the Kulamalu Residential Subdivision flows across the golf course and towards the proposed subdivision. To prevent this runoff from entering the site, cut-off swales will direct off-site flows around the site. A culvert at the entry road on the southerly side of the site will convey off-site flows under the road and to the downstream areas. (See Figure 7 - Drainage Area Map – Developed, page 12.)

The on-site drainage system consists of swales, catch basins, manholes, drain pipes, and a grassed, shallow, open pond D/R basin. The on-site system will collect runoff and direct it to the D/R basin. The basin will keep post development flow rates and volumes at pre-

development levels. (See Figure 8 – Preliminary Grading and Drainage Plan, page 13.)

The County Standards require the use of a 50-year, 1-hour rainfall for computing volumes and rates of flow.

Drainage improvements that involve transmission of storm flows will conform to the "Rules for the Design of Storm Drainage Facilities in the County of Maui." The rules will be applied to the sizing and spacing of inlets and manholes, and sizing of drain lines, channels, and culverts. Based on the County rules, the drainage system will be designed to handle a storm with a recurrence interval of 50 years since the drainage area is less than 100 acres.

The following is a summary of hydrologic design data for on-site area. (See Appendix B - Preliminary Drainage Information.)

Item	Existing	Developed
Drainage Area	6.00 acres	6.00 acres
50-year, 1-hour Rainfall	2.8 inches	2.8 inches
50-year, 1-hour Peak Flow	8.65 cfs	18.35 cfs

The increase in the rate of runoff and volume of runoff will be mitigated by constructing the D/R basin. The D/R basin will collect runoff, regulate the outflow of runoff, and retain a portion of the collected runoff. As shown in the preliminary computations, a detention volume of 9,540 cubic feet is required to reduce the peak outflow from 18.35 cubic feet per second to 8.65 cubic feet per second. Also as shown in the preliminary computations, a retention volume of 12,850 cubic feet is required to keep runoff volumes at pre-development levels.

The following is a summary of preliminary design data for the drainage D/R basin. These figures are subject to adjustment as the designs are further refined.

Detention Volume	9,540 cubic feet
Retention Volume	12,850 cubic feet
Flow Rate In	18.35 cubic feet per second
Flow Rate Out	8.65 cubic feet per second

F. Conclusion

There will be no adverse effects on the adjacent or downstream properties due to this project. This conclusion is based on maintaining peak discharge rates and volumes at pre-development levels.

VII. REFERENCES

1. City and County of Honolulu, Department of Public Works, Division of Engineering, *Storm Drainage Standards*, Honolulu, Hawaii, May 1988.

2. County of Maui, "Title MC-15, Department of Public Works and Waste Management, Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui," Wailuku, Hawaii, November 1995.

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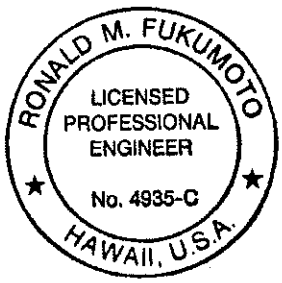
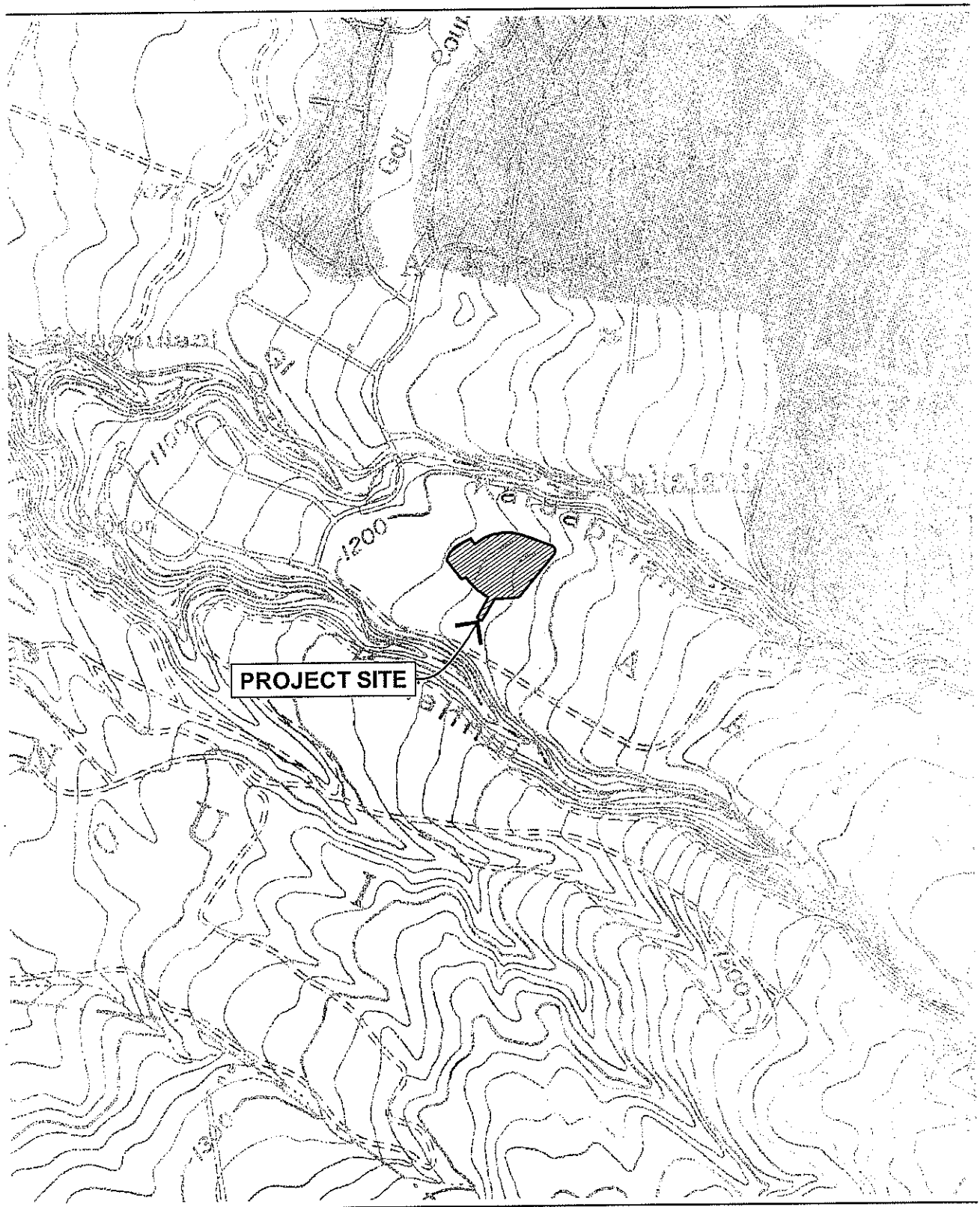


This work was prepared by
me or under my supervision.

Ronald M. Fukumoto



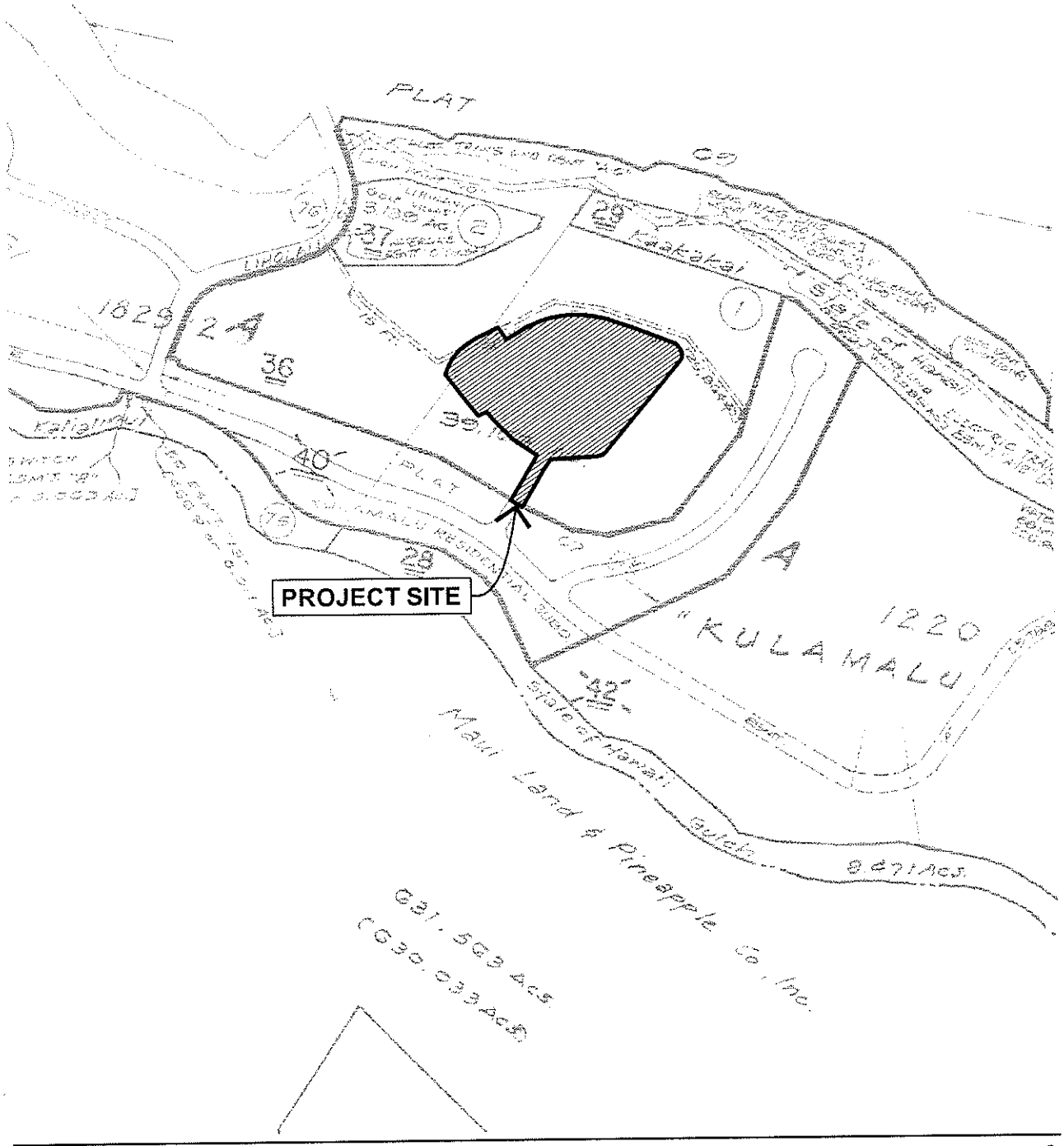
LOCATION MAP (USGS MAP)

Figure 1

SCALE IN FEET

NORTH 0 500 1000 2000 3000

SOURCES: USGS PUU O KALI QUADRANGLE MAP & USGS PAIA QUADRANGLE MAP



VICINITY MAP (TAX MAP)

SCALE IN FEET

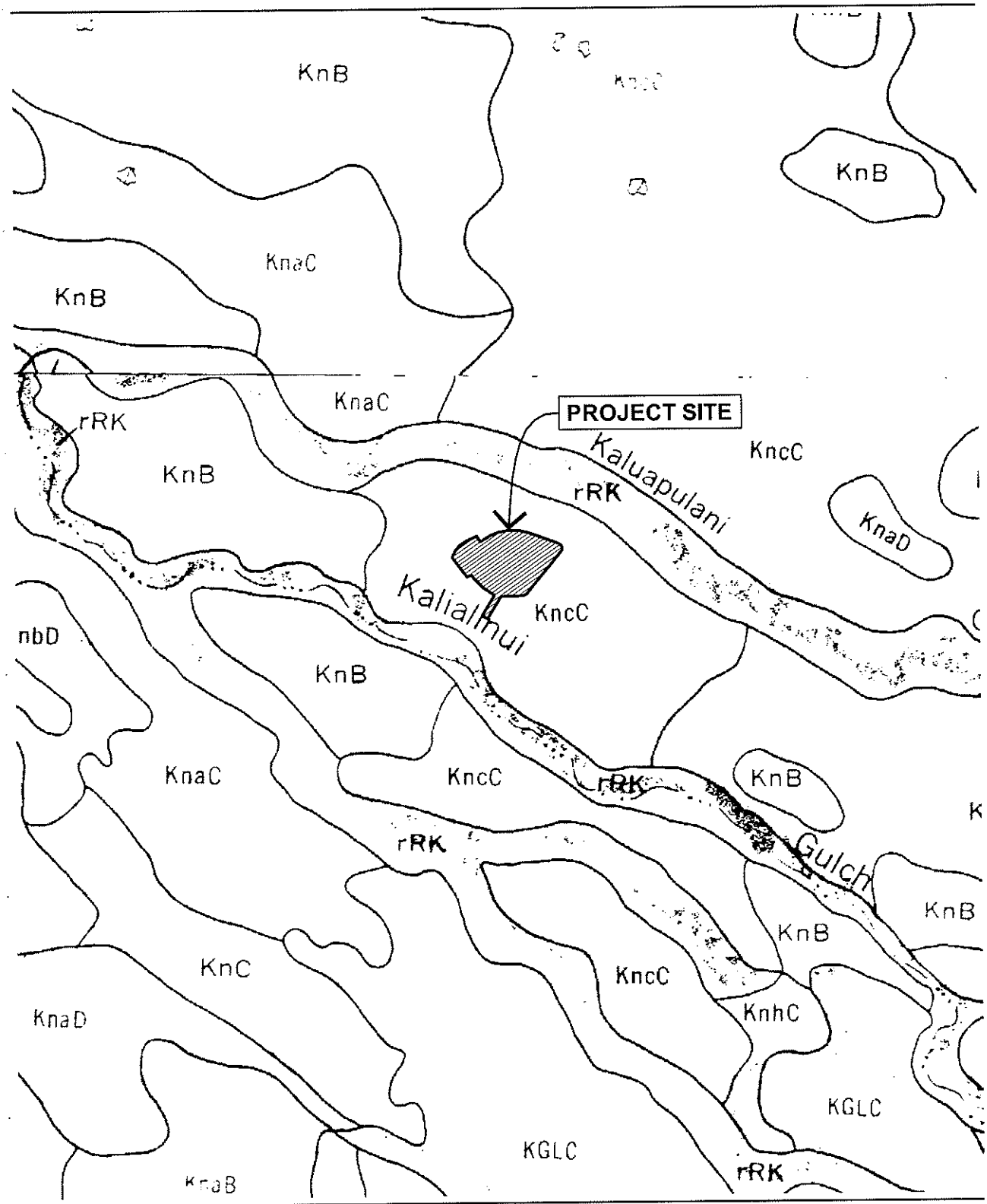
NORTH 0 250 500 1000 1500

Figure 2

SOURCE: TAX MAP KEY: (2) 2-3-008:POR. 036

PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



SOIL MAP

SCALE IN FEET

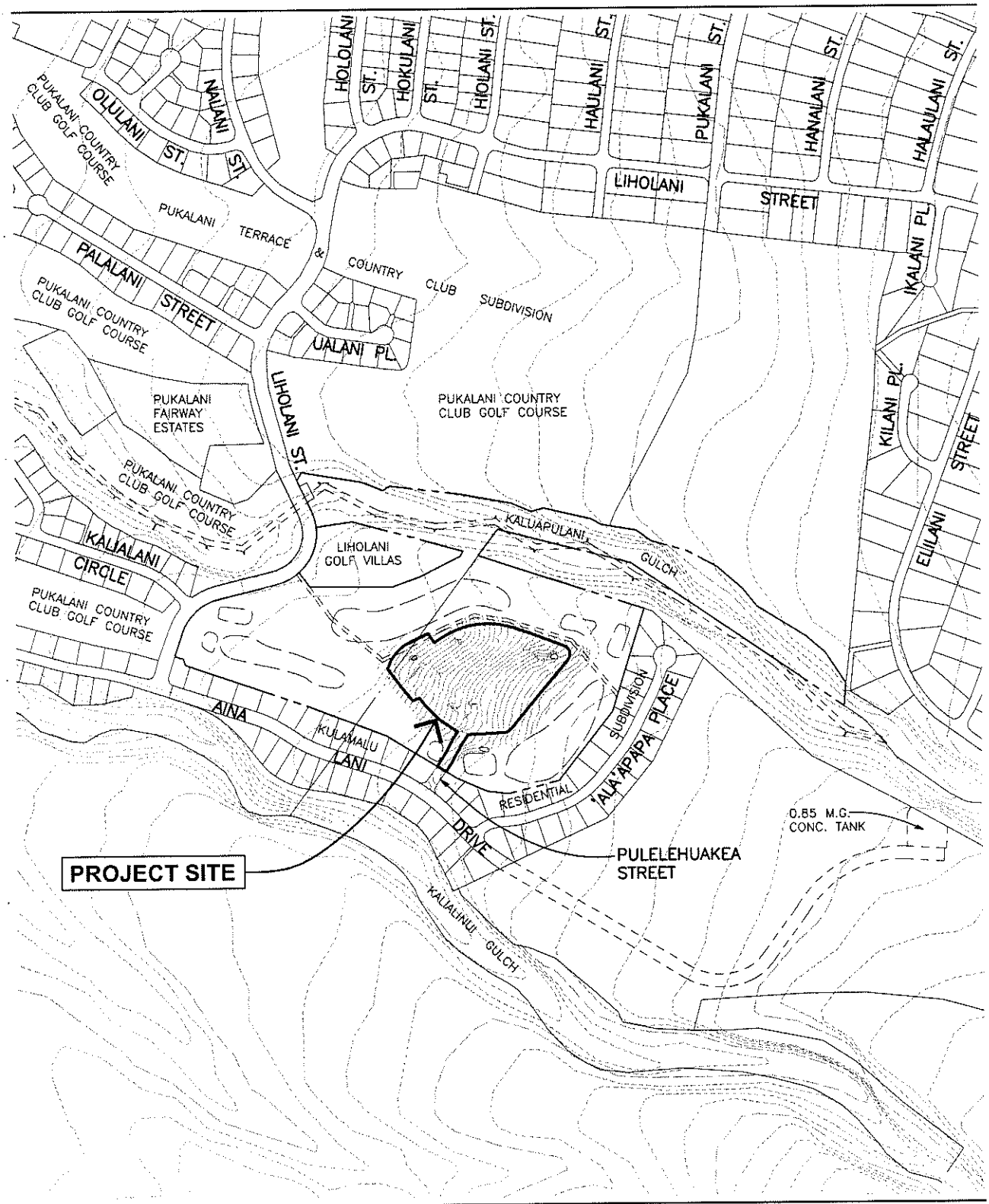
NORTH 0 500 1000 2000 3000

Figure 3

SOURCE: SOIL SURVEY

PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



REGIONAL TOPOGRAPHIC MAP

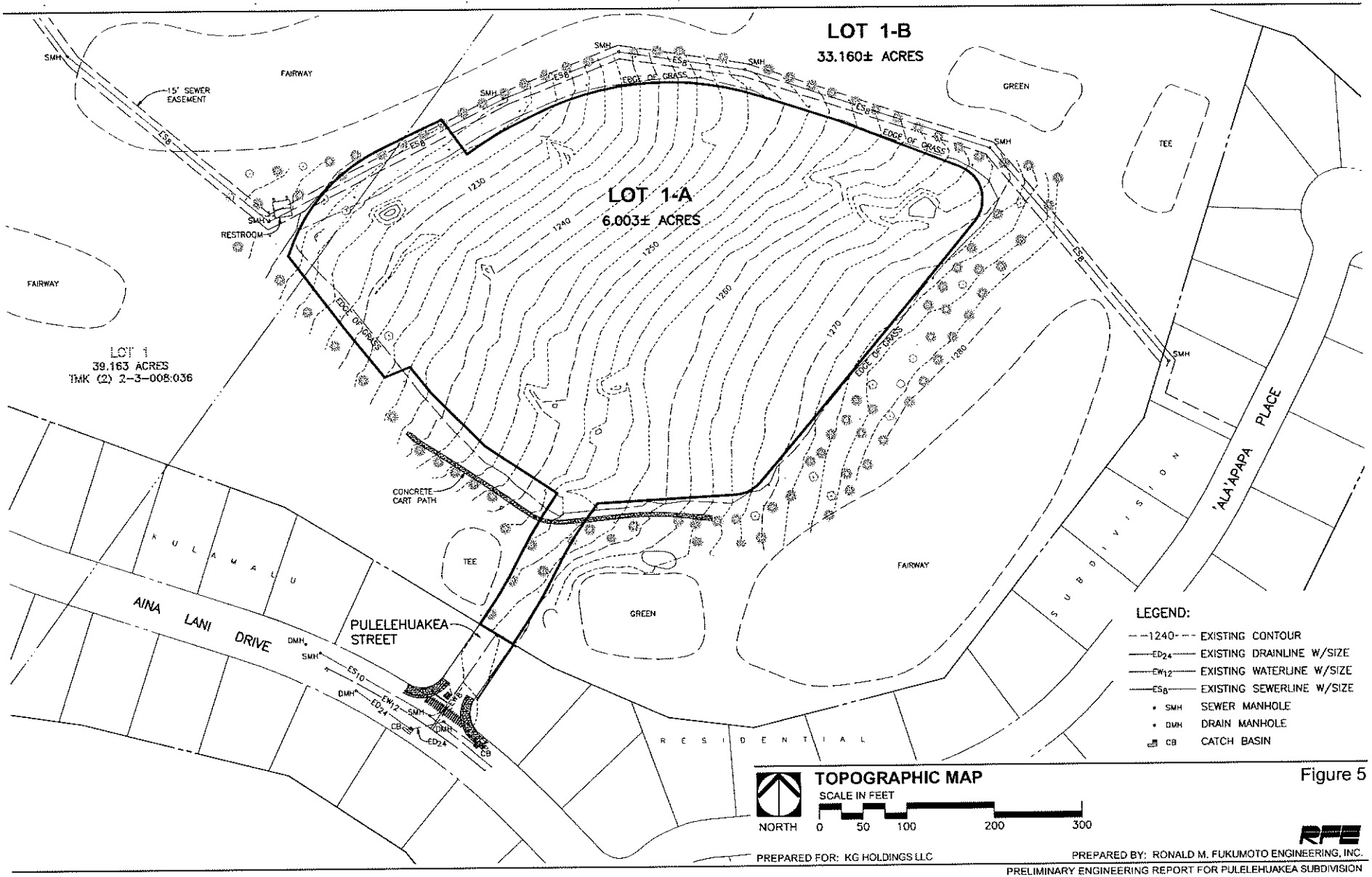
Figure 4

SCALE IN FEET

NORTH 0 300 600 1200 1800

PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



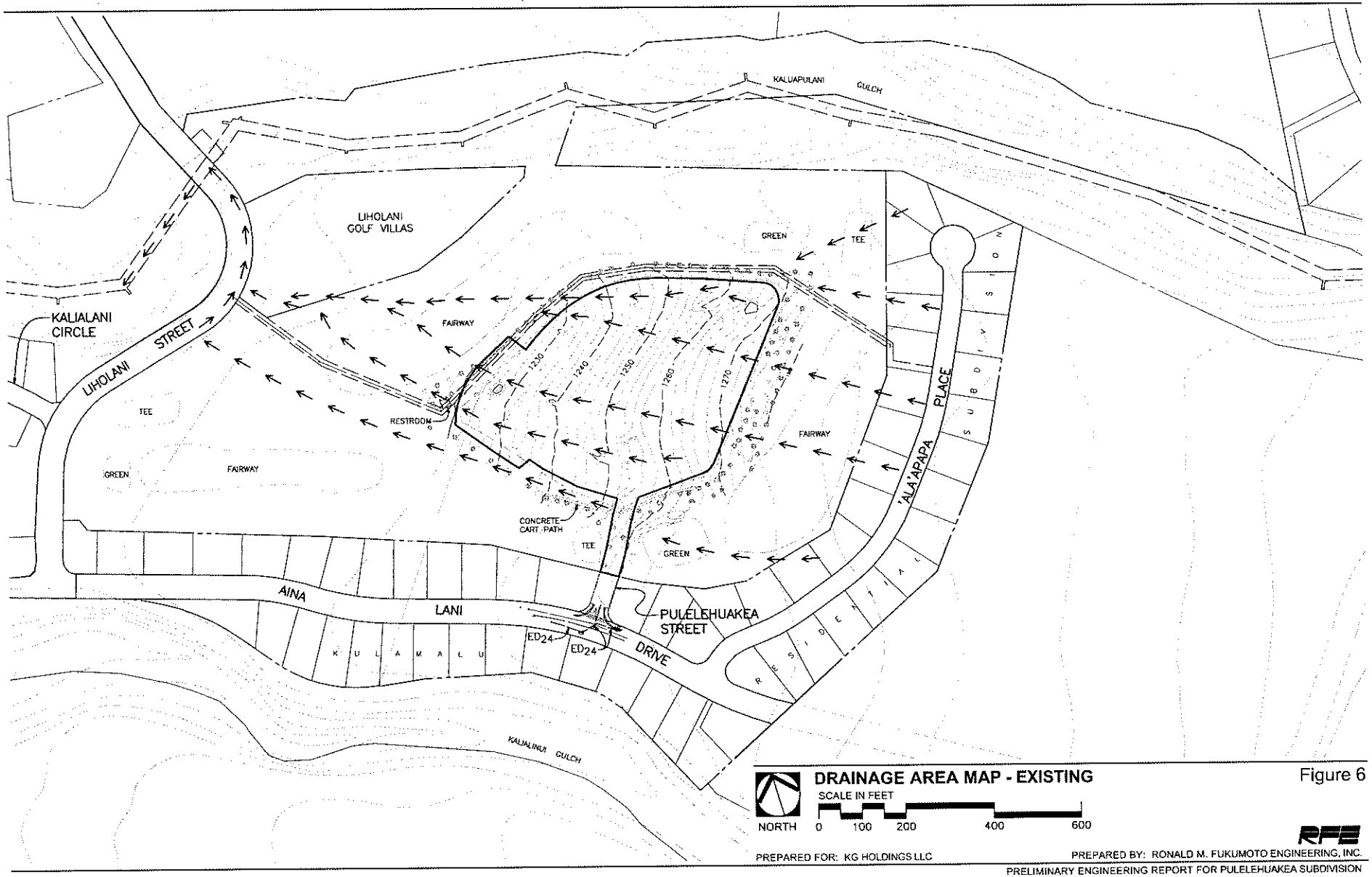
TOPOGRAPHIC MAP

SCALE IN FEET

Figure 5

PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.

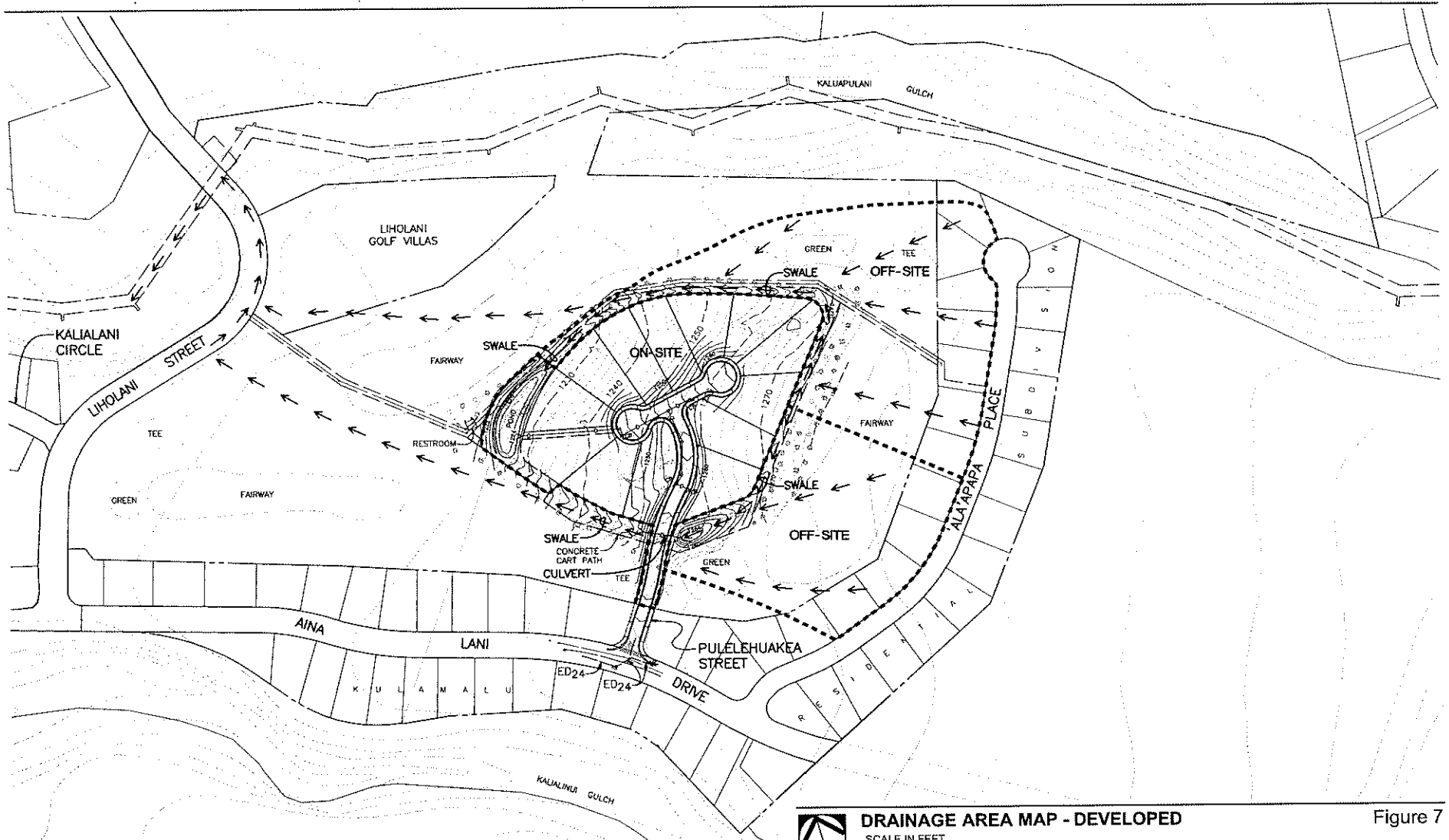


DRAINAGE AREA MAP - EXISTING

Figure 6

PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.

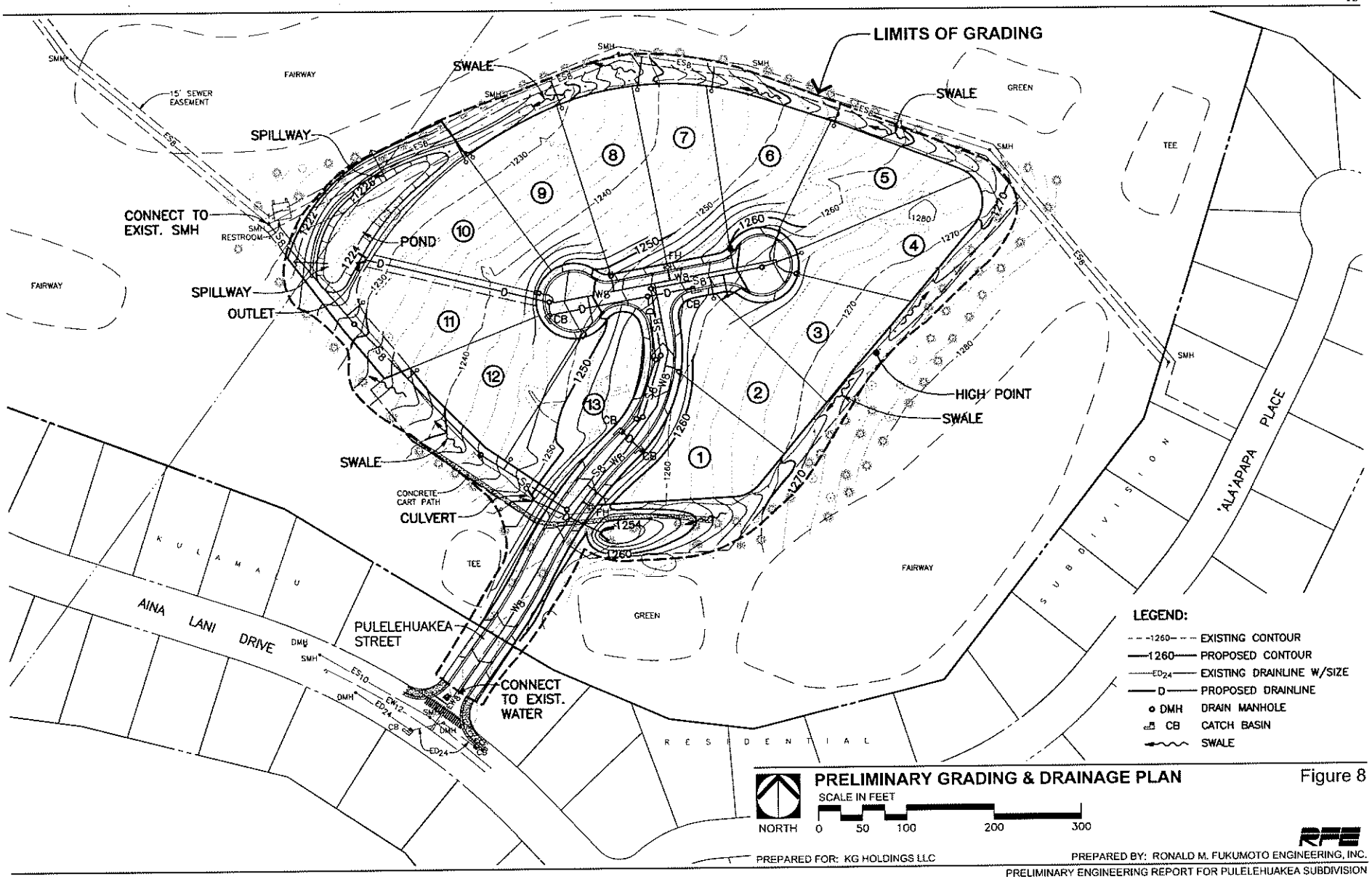


DRAINAGE AREA MAP - DEVELOPED

Figure 7

PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



PRELIMINARY GRADING & DRAINAGE PLAN Figure 8

SCALE IN FEET

NORTH 0 50 100 200 300

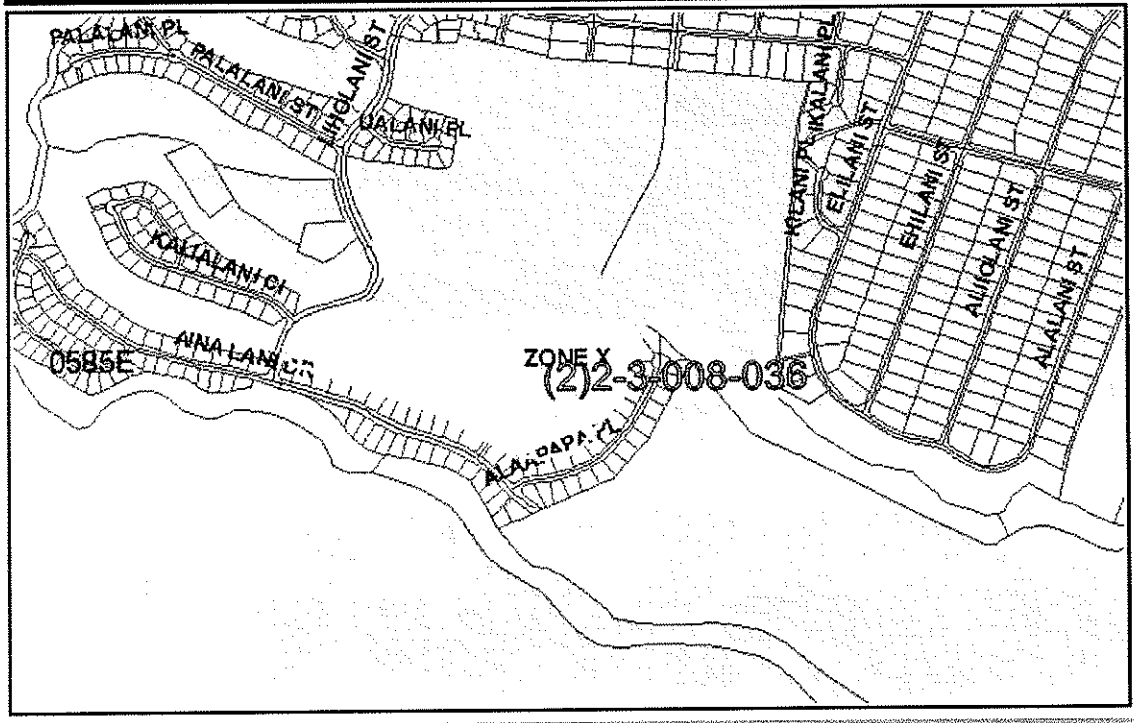
PREPARED FOR: KG HOLDINGS LLC

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.

FLOOD HAZARD ASSESSMENT REPORT

State of Hawaii

FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

What flood hazard zones are shown on FEMA's Flood Insurance Rate Map and what do they mean?

Zones VE and V1-V30: Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevation (BFEs) derived from detail hydraulic analyses are shown within these zones. Mandatory flood insurance purchase requirements apply.

Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no BFEs or flood depths are shown. Mandatory flood insurance purchase requirements apply.

Zones AE and A1-A30: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within these zones. Mandatory flood insurance purchase requirements apply.

Zone AH: Areas subject to inundation by the 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements apply.

Zones B, C, and X: Areas identified as areas of moderate or minimal hazard from the principal source of flood in the area. However, buildings in these zones could be flooded by severe, concentrated rainfall coupled with inadequate local drainage systems. Flood insurance is available in participating communities but is not required by regulation in these zones.

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

PROPERTY INFORMATION

COUNTY:	MAUI
TMK NO:	(2)2-3-008-036
SITE ADDRESS:	LIHOLANI ST
FEMA FIRM PANEL(S):	1500030585E
PANEL EFFECTIVE DATE(S):	SEPTEMBER 25, 2009
FIRM INDEX DATE:	SEPTEMBER 25, 2009
LETTER OF MAP CHANGE(S):	NONE
PARCEL DATA FROM:	APRIL 2009
IMAGERY DATA FROM:	MAY 2005

IMPORTANT PHONE NUMBERS

County NFIP Coordinator County of Maui Francis Cerizo, CFM	(808) 270-7771
State NFIP Coordinator Carol Tyau-Beam, P.E., CFM	(808) 587-0267

Disclaimer: The Department of Land and Natural Resources assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the Department of Land and Natural Resources from any liability which may arise from its use.

Preliminary DFIRM Disclaimer: If this map has been identified as "PRELIMINARY", please note that it is being provided for commenting purposes only and is not to be used for official/legal decisions or regulatory compliance.

PRELIMINARY DRAINAGE INFORMATION

A. RUNOFF COEFFICIENT

1. Existing Conditions

Infiltration – medium	0.07
Relief – rolling (5%-15%)	0.03
Vegetal Cover – Good	0.03
Development Type – Agricultural	0.15
C =	0.28

2. Developed Conditions

Infiltration – medium	0.07
Relief – rolling (5%-15%)	0.03
Vegetal Cover – Good	0.03
Development Type – Residential	0.40
C =	0.53

B. RECURRENCE INTERVAL & RAINFALL

1. Recurrence interval T_m = 50 years (due to sump conditions)
2. One-hour rainfall I_{50} = 2.8 inches

C. TIME OF CONCENTRATION

1. Existing Conditions T_c = 15 minutes
2. Developed Conditions T_c = 10 minutes

D. EXISTING RUNOFF (Rational Method)

1. C= 0.28
2. i = 2.8 x 1.84 = 5.15
3. a = 6.00 acres
4. Q= Cia = 0.28 x 5.15 x 6.00 = 8.65 cfs

E. DEVELOPED RUNOFF (Rational Method)

1. C= 0.53
2. i = 2.8 x 2.06 = 5.77
3. a = 6.00 acres
4. Q= Cia = 0.53 x 5.77x 6.00 = 18.35 cfs

F. INCREASE DUE TO DEVELOPMENT (Rational Method)

1. ΔQ = 18.35 – 8.65 = 9.70 cfs (for 50-year, 1-hour storm)

G. CURVE NUMBER (CN) COMPUTATION

1. Existing

Open Space	CN = 61	Area = 6.00 acres

2. Developed

Open Space	CN = 61	Area = 3.6 acres
Building, Parking, & Walkways	CN = 98	Area = 2.4 acres

CN = [(61 x 3.6) + (98 x 2.4)/6.00] = 76

H. RAINFALL DATA

1. 50-year, 1-hour P = 2.8 inches

I. RETENTION VOLUME

1. 50-year, 1-hour
   a. Existing – 6.00 acres
      $S = (1000/CN) - 10 = (1000/61) - 10 = 6.39$
      $Q = (P - 0.2S)^2/(P + 0.8S) = (2.8 - 0.2 \times 6.39)^2/(2.8 + 0.8 \times 6.39) = 0.29$ inch
      Volume = (0.29/12) x 6.00 x 43,560 = 6,316 cu. ft.
   b. Developed – 6.00 acres
      $S = (1000/CN) - 10 = (1000/76) - 10 = 3.16$
      $Q = (P - 0.2S)^2/(P + 0.8S) = (2.8 - 0.2 \times 3.16)^2/(2.8 + 0.8 \times 3.16) = 0.88$ inch
      Volume = (0.88/12) x 6.00 x 43,560 = 19,166 cu. ft.
   c. Increase due to development
      $\Delta V = 19,166 - 6,316 = 12,850$ cubic feet

J. DETENTION VOLUME

RATIONAL METHOD DETENTION BASIN SIZING

Design Data

Drainage Area = A =	6.00	acres
Developed Runoff Coefficient = C =	0.53	
Design Storm =	50	year
One Hour Rainfall = i =	2.80	inches
Present Peak Discharge = Q_{OUT} =	8.65	cfs
Developed Peak Discharge = Q_{IN} =	18.35	cfs
Q_{OUT} / Q_{IN} =	0.47	
Outflow Adjustment Coefficient = k =	0.86	

Storm Duration, minutes	Correction Factor	Rainfall Intensity, in./hr.	Runoff Volume, cu. ft.	Outflow Volume, cu. ft.	Storage Volume, cu. ft.
T	*f*	*I = fi*	*CIAT*	$kQ_{OUT}T$	(4) - (5)
(1)	(2)	(3)	(4)	(5)	(6)
1.0	8.5512	23.943	4,606	446	4,160
2.0	4.7169	13.207	5,082	893	4,189
3.0	3.4759	9.733	5,617	1,339	4,278
4.0	2.8858	8.080	6,218	1,785	4,433
5.0	2.5575	7.161	6,889	2,232	4,657
6.0	2.3605	6.609	7,629	2,678	4,951
7.0	2.2374	6.265	8,437	3,124	5,313
8.0	2.1578	6.042	9,299	3,571	5,728
9.0	2.1025	5.887	10,193	4,017	6,176

10.0	2.0576	5.761	11,084	4,463	6,621	
11.0	2.0135	5.638	11,931	4,910	7,021	
12.0	1.9689	5.513	12,728	5,356	7,372	
13.0	1.9244	5.388	13,477	5,802	7,675	
14.0	1.8807	5.266	14,184	6,249	7,935	
15.0	1.8381	5.147	14,853	6,695	8,158	
16.0	1.7971	5.032	15,489	7,141	8,348	
17.0	1.7578	4.922	16,098	7,588	8,510	
18.0	1.7205	4.817	16,683	8,034	8,649	
19.0	1.6855	4.719	17,251	8,480	8,771	
20.0	1.6529	4.628	17,808	8,927	8,881	
21.0	1.6227	4.544	18,357	9,373	8,984	
22.0	1.5946	4.465	18,898	9,819	9,079	
23.0	1.5684	4.392	19,432	10,266	9,166	
24.0	1.5438	4.323	19,959	10,712	9,247	
25.0	1.5206	4.258	20,478	11,159	9,319	
26.0	1.4986	4.196	20,989	11,605	9,384	
27.0	1.4775	4.137	21,490	12,051	9,439	
28.0	1.4572	4.080	21,979	12,498	9,481	
29.0	1.4376	4.025	22,458	12,944	9,514	
30.0	1.4184	3.972	22,922	13,390	9,532	
30.9	1.4016	3.924	23,330	13,792	9,538	peak
31.0	1.3997	3.919	23,374	13,837	9,537	
32.0	1.3814	3.868	23,813	14,283	9,530	
33.0	1.3635	3.818	24,239	14,729	9,510	
34.0	1.3459	3.769	24,651	15,176	9,475	
35.0	1.3287	3.720	25,052	15,622	9,430	
36.0	1.3118	3.673	25,440	16,068	9,372	
37.0	1.2953	3.627	25,817	16,515	9,302	
38.0	1.2808	3.586	26,218	16,961	9,257	
39.0	1.2634	3.538	26,543	17,407	9,136	
40.0	1.2479	3.494	26,889	17,854	9,035	

Required Detention Volume = 9,538 ≈ 9,540 cubic feet to reduce developed flow from 18.35 cfs to pre-development flow of 8.65 cfs.

K. DETENTION/RETENTION BASIN SIZING

Compute required size of D/R basin consisting of a pond. The total required volume = 12,850 (retention) + 9,540 (detention) = 22,390 cubic feet.

APPENDIX B.

Flora and Fauna Study

FLORA AND FAUNA STUDY

for the

PULELEHUAKEA RESIDENTIAL SUBDIVISION PROJECT

PUKALANI, MAUI, HAWAII

by

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Kokomo, Maui
May 2010

Prepared for: KG Maui Development, LLC.

FLORA AND FAUNA STUDY
PULELEHUAKEA RESIDENTIAL SUBDIVISON PROJECT
PUKALANI, MAUI, HAWAII

INTRODUCTION

The Pulelehuakea Residential Subdivision Project lies on 6.003 acres of undeveloped land (TMK (2) 2-3-08:036 por.) located between fairways of the Pukalani Country Club on a gently sloping ridgetop between Kaluapulani and Kalialinui Gulches. This study was initiated by the owners in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

The property consists of former agricultural land that has long stood idle. Today it is embedded within golf course fairways within a large residential community between elevations of 1,240 feet and 1,360 feet above sea level. Vegetataion is mostly dry grassland and brush with a few scattered trees. Soils are entirely Keahua Silty Clay, 7 – 15% slopes (KncC) which is a deep, dark reddish-brown soil developed from igneous rock that has an erosion hazard that is slight to moderate (Foote et al). Rainfall averages 30 inches per year with the bulk falling during the winter months (Armstrong,1983).

BIOLOGICAL HISTORY

This area once had dryland vegetation consisting of wiliwili (*Erythrina sandwicensis*),'a'ali'i (*Dodonaea viscosa*), 'akia (*Wikstroemia monticola*) and a mixture of other grasses and shrubs and with a few larger trees in the gulches.

During the 1900's the gentler slopes were farmed with pineapple and cattle grazing was wide spread. These land uses gradually destroyed most of the native species which were replaced by agricultural crops and weeds or by hardy pasture grasses. Today little remains of the native plants on the ridgetops and the area is dominated by non-native species.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the proposed Pulelehuakea Residential Subdivision Project which was conducted in May 2010. The objectives of the survey were to:

1. Document what plant, bird and mammal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.
5. Note which aspects of the proposed development pose significant concerns for plants or for wildlife and recommend measures that would mitigate or avoid these problems.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used to cover all parts of this property. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The vegetation on the property consists of a dry grassland with shrubs and a few scattered trees. The most abundant species was Guinea grass (*Panicum maximum*) which was found throughout the property. Also common were koa haole (*Leucaena leucocephala*) and buffelgrass (*Cenchrus ciliaris*).

A total of 57 plant species were recorded during the survey. Of these 5 were native species including the wiliwili (Waltheria indica) and koali awahia (Ipomoea indica) which are native to Hawaii as well as to many other Pacific islands. One species the niu or coconut was a Polynesian introduction to Hawaii. The remaining 51 species were non-native agricultural weeds, pasture palnts or ornamentals.

DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the property is dominated by a wide array of non-native plant species, none of which are of any particular interest or concern. The 5 native plants were all rare on the property, but are all widespread in Hawaii and fairly common.

No federally listed Endangered or Threatened native plants (USFWS, 2009) were encountered during the survey, nor were any species that are candidates for such status found. No special habitats or rare plant communities were seen either.

Because of the above situation, there is little of botanical concern and the proposed development is not expected to have a significant negative impact on the botanical resources in this part of Maui. No particular recommendations regarding the botanical resources are deemed appropriate or necessary.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within each of three groups: Conifers, Monocots and Dicots. Taxonomy and nomenclature of the Conifers are in accordance with Staples & Herbst (2005) while the flowering plants (Monocots and Dicots) are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:
   endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.
   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).
   non-native = all those plants brought to the islands intentionally or accidentally after western contact.
   polynesian = all those plants brought to the islands by the Hawaiians during the course of their migrations.

4. Abundance of each species within the project area:
   abundant = forming a major part of the vegetation within the project area.
   common = widely scattered throughout the area or locally abundant within a portion of it.
   uncommon = scattered sparsely throughout the area or occurring in a few small patches.
   rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME COMMON NAME STATUS ABUNDANCE

CONIFERS			
ARAUCARIACEAE (Araucaria Family)			
Araucaria columnaris (G. Forster) J.D. Hooker	Cook-pine	non-native	uncommon
MONOCOTS			
ARECACEAE (Palm Family)			
Cocos nucifera L.	Niu, coconut	Polynesian	rare
CYPERACEAE (Sedge Family)			
Kyllingia brevifolia	kilio'opu	non-native	rare
POACEAE (Grass Family)			
Cenchrus ciliaris L.	buffelgrass	non-native	common
Chloris virgata Sw.	feather fingergrass	non-native	rare
Cynodon dactylon (L.) Gaertn.	Bermuda grass	non-native	uncommon
Eleusine indica (L.) Gaertn.	wiregrass	non-native	rare
Eragrostis amabilis (L.) Wight & Arnott	Japanese lovegrass	non-native	rare
Melinis repens (Willd.) Zizka	Natal redtop	non-native	rare
Panicum maximum Jacquin	Guinea grass	non-native	abundant
Pennisetum clandestinum Chiov.	Kikuyu grass	non-native	rare
Setaria verticillata (L.) P. Beauv.	bristly foxtail	non-native	rare
DICOTS			
AMARANTHACEAE (Amaranth Family)			
Amaranthus spinosus L.	spiny amaranth	non-native	rare
Chenopodium carinatum R. Br.	keeled goosefoot	non-native	rare
Salsola tragus L.	Russian thistle	non-native	rare
APOCYNACEAE (Dogbane Family)			
Asclepias physocarpa (E. Meyen) Schlecter	baloon plant	non-native	rare
ASTERACEAE (Sunflower Family)			
Bidens pilosa L.	Spanish needle	non-native	rare
Cirsium vulgare (Savi) Ten.	bull thistle	non-native	rare
Conyza bonariensis (L.) Cronq.	hairy horseweed	non-native	rare
Gamochaeta purpurea (L.) Cabrera	purple cudweed	non-native	rare
Heterotheca grandiflora Nutt.	telegraph weed	non-native	rare
Pluchea carolinensis (Jacq.) G. Don	sourbush	non-native	rare
Senecio madagascariensis Poir.	fireweed	non-native	uncommon
Sonchus oleraceus L.	pualele	non-native	rare
Verbesina encelioides (Cav.) Benth.&Hook.	golden crown-beard	non-native	uncommon
BRASSICACEAE (Mustard Family)			
Hirschfieldia incana (L.) Lag.-Fos.	black mustard	non-native	rare
Raphanus raphanistrum L.	wild radish	non-native	rare
CACTACEAE (Cactus Family)			
Opuntia ficus-indica (L.) Mill.	panini	non-native	rare
CARYOPHYLLACEAE (Pink Family)			
Polycarpon tetraphyllum (L.) L.	four-leaved allseed	non-native	rare
SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE

CONVOLVULACEAE (Morning Glory Family)			
Ipomoea indica (J. Burm.) Merr.	koali awahia	indigenous	rare
Merremia aegyptia (L.) Urb.	hairy merremia	non-native	rare
EUPHORBIACEAE (Spurge Family)			
Ricinus communis L.	Castor bean	non-native	rare
FABACEAE (Pea Family)			
Chamaecrista nictitans (L.) Moench	partridge pea	non-native	uncommon
Crotalaria incana L.	fuzzy rattlepod	non-native	uncommon
Crotalaria pallida Aiton	smooth rattlepod	non-native	rare
Desmanthus pernambucanus (L.) Thellung	slender mimosa	non-native	rare
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	non-native	rare
Erythrina sandwicensis Degener	wiliwili	endemic	rare
Indigofera hendecaphylla Jacq.	creeping indigo	non-native	rare
Indigofera suffruticosa Mill.	inikö	non-native	rare
Leucaena leucocephala (Lam.) de Wit	koa haole	non-native	common
Macroptillium lathyroides (L.) Urb.	wild bean	non-native	uncommon
Medicago lupulina L.	black medick	non-native	rare
Melilotus indica (L.) All.	sweet clover	non-native	rare
Prosopis pallida (Humb. & Bonpl.ex Willd.) Kunth	kiawe	non-native	rare
LAMIACEAE (Mint Family)			
Leonotis nepetifolia (L.) R. Br.	lion's ear	non-native	rare
MALVACEAE (Mallow Family)			
Abutilon grandifolium (Willd.) Sw.	hairy abutilon	non-native	rare
Malva parviflora L.	cheese weed	non-native	uncommon
Malvastrum coromandelianum (L.) Garcke	false mallow	non-native	rare
Sida fallax Walp.	'ilima	indigenous	rare
Waltheria indica L.	'uhaloa	indigenous	rare
PLANTAGINACEAE (Plantain Family)			
Plantago lanceolata L.	narrow leaved plantain	non-native	rare
PROTEACEAE (Protea Family)			
Grevillea robusta A. Cunn.ex R.Br.	silk oak	non-native	rare
SAPINDACEAE (Soapberry Family)			
Dodonaea viscosa Jacq.	'a'ali'i	indigenous	rare
SOLANACEAE (Nightshade Family)			
Nicandra physalodes (L.) Gaertn.	apple of Peru	non-native	rare
Nicotiana glauca R. C. Graham	tree tobacco	non-native	rare
VERBENACEAE (Verbena Family)			
Lantana camara L.	lantana	non-native	uncommon

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through survey method was conducted in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Endangered Hawaiian hoary bat (Lasiurus cinereus semotus) in the area.

RESULTS

MAMMALS

Sign of just one mammal species was observed during two site visits. Taxonomy and nomenclature follow Tomich (1986).

Axis deer (*Axis axis*) – Abundant old sign of deer was found throughout the property, although none was recent. Deer are found in pasture lands and in gulches around Pukalani. They usually move about and feed at night.

Other mammals one could expect to see in this habitat include mice (Mus domesticus), rats (Rattus spp.), mongoose (Herpestes auropunctatus) and cats (Felis catus). Mice and rats feed on seeds, fruits and herbaceous vegetation, and mongoose and cats prey on these rodents and birds.

A special effort was made to look for the Endagered Hawaiian hoary bat by making an evening survey of the property. When present in an area they can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. No evidence of such activity was observed though visibility was excellent. In addition an electronic bat detecting device (Batbox IIID) was employed, set to the frequency of 28,000 hertz which these bats are known to use for echolocation. No bat activity was detected using this device either.

BIRDS

There was moderate birdlife in both diversity and numbers on this dry property. Ten species of non-native birds were observed during two site visits. Taxonomy and nomenclature follow American Ornithologists' Union (2005).

Common myna (*Acridotheres tristis*) – Several pairs of mynas were seen on and around this property.

House Finch (*Carpodacus mexicanus*) – A few flocks of these finches were seen and heard calling around the property.

Northern cardinal (*Cardinalis cardinalis*) – Several of these bright red cardinals were seen and heard calling from brush and trees.

House sparrow (*Passer domesticus*) – A few small flocks of these sparrows were seen and heard chattering in shrubs on the property.

Spotted dove (*Streptopelia chinensis*) – A few of these large doves were seen perched in trees or flying overhead.

Zebra dove (*Geopelia striata*) – A few small groups of these doves were seen feeding on the ground in small openings.

Japanese white-eye (*Zosterops japonicus*) – A few of these small green birds were seen and heard making their high-pitched chattering calls.

African silverbill (*Lonchura cantans*) – One small flock of these silverbills was seen in a koa haole thicket.

Gray francolin (*Francolinus pondicerianus)* – One francolin was heard making its distinctive rolling call from the grassland.

Red-crested cardinal (*Paroaria coronata*) – One of these bright red-headed cardinals was seen on the edge of the property.

A few other non-native birds might commonly be seen in and around this property, but the habitat is not suitable for Hawaii's native forest birds that are presently restricted to native forests at higher elevations beyond the range of mosquitoes and the lethal avian diseases they carry and for which our native birds have no immunity. The habitat is also too close to human activities for the pueo or Hawaiian owl (*Asio flammeus sandwichensis*) which prefers expanses of open country.

INSECTS

While insects in general were not tallied, they were abundant throughout the area and fueled the bird life observed. One native Sphingid moth, Blackburn's sphinx moth (*Manduca blackburni*) has been put on the Federal Endangered species list and this designation requires special focus (USFWS 2000). Blackburn's sphinx moth is known to occur in parts of East Maui and Central Maui but is not presently known from Pukalani and Kula. Its native host plants are species of 'Aiea (*Nothocestrum* spp.) and non-native alternative host plants are tobacco (*Nicotiana tabacum*) and tree tobacco (*Nicotiana glauca*). One dead tree tobacco plant was found on the property, and no Blackburn's sphinx moth or their larvae were observed.

CONCLUSIONS AND RECOMMENDATIONS

All of the mammals, birds and insects found on this property were non-native species that are of no particular conservation interest or concern. No fauna species were found that are federally listed Endangered or Threatened species.

No special fauna habitats or communities were identified on the property either. The proposed development of this property is not expected to have a significant negative impact on the fauna resources in this part of Maui.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within two groups: Mammals and Birds. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:
   - endemic = native only to Hawaii; not naturally occurring anywhere else in the world.
   - indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).
   - migratory = all species that spend part of their annual life cycle in Hawaii and part of it elsewhere. Migrant birds typically spend their spring and summer months breeding in the arctic and their fall and winter months in Hawaii.
   - non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.
4. Abundance of each species within the project area:
   - abundant = many flocks or individuals seen throughout the area at all times of day.
   - common = a few flocks or well scattered individuals throughout the area.
   - uncommon = only one flock or several individuals seen within the project area.
   - rare = only one or two seen within the project area.

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE
MAMMALS			
Axis deer	*Axis axis*	non-native	uncommon
BIRDS			
Common myna	*Acridotheres tristis*	non-native	common
House finch	*Carpodacus mexicanus*	non-native	common
Northern cardinal	*Cardinalis cardinalis*	non-native	common
House sparrow	*Passer domesticus*	non-native	common
Zebra dove	*Geopelia striata*	non-native	uncommon
Spotted dove	*Streptopelia chinensis*	non-native	uncommon
Japanese white-eye	*Zosterops japonicus*	non-native	uncommon
African silverbill	*Lonchura cantans*	non-native	rare
Gray francolin	*Francolinus pondicerianus*	non-native	rare
Red-crowned cardinal	*Paroaria coronata*	non-native	rare

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APPENDIX C.

Archaeological Inventory Survey

SCS Project Number 1096-AA-1

AN ARCHAEOLOGICAL ASSESSMENT ON APPROXIMATELY 36 ACRES FOR A RESIDENTIAL SUBDIVISION IN PUKALANI A`APUEO AND MAKA`EHA AHUPUA`A, MAKAWAO DISTRICT ISLAND OF MAUI, HAWAI`I [TMK: (2) 2-3-08:36 por. and 2-3-09:39]

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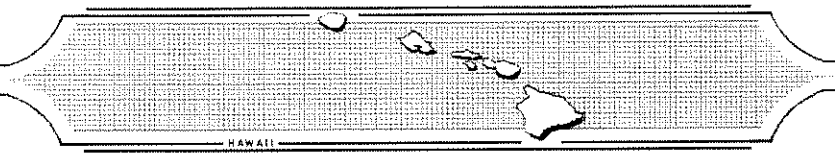

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Figure 13: Profile of Trench 11 in West Portion of Southern Project Area Showing Stratigraphic Sequence. 27

INTRODUCTION

At the request of KG Holdings, LLC, Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey (AIS) on two parcels of land totaling approximately 36-acres for a residential subdivision in Pukalani, `A`apueo and Maka`eha Ahupua`a, District of Makawao, Island of Maui, Hawai`i [TMK: (2) 2-3-08:36 por. and (2) 2-3-09:39] (Figures 1, 2, and 3). Fieldwork was conducted by SCS archaeologists Ian Bassford, B.A. and David Perzinski, B.A, on October 25-27, 2009 under the direction of Robert L. Spear, Ph.D (Principle Investigator). While Inventory Survey-level investigations were completed, this report is being written as an Archaeological Assessment because fieldwork did not find any cultural material of historic significance.

The overall purpose of the project was to determine the presence or absence of architecture, midden deposits, and artifact deposits on the surface of the project area, as well as assess the potential for the presence of subsurface cultural deposits. If sites/historic properties were identified, they were to be evaluated in terms of significance criteria. To address the potential for any subsurface sites, eleven trenches were mechanically excavated to aid in identifying any intact subsurface sites and/or cultural layers. No sites were identified in subsurface contexts as well. Extensive alteration by historic and modern grading and grubbing, as explained more so below, appears to have significantly altered the natural topography of the parcels.

ENVIRONMENTAL SETTING

PROJECT AREA LOCATION

The project area consists of two parcels of land with a total area of approximately 36-acres. The northern parcel is roughly rectangular in shape and bounded by the Pukalani Golf Course Parking Lot to the west, residential housing to the north and east, and Kaluapulani Gulch to the south, covering an area of 30.457-acres. The parcel is situated on an east/west running slope at an elevation of 1400-1480 feet at a distance of 10.35 km from the coastline. The southern parcel is irregular in shape and is bounded by the 5th, 6th and 7th holes. This parcel is located at an elevation of 1220-1280 feet and is situated 10.50 km inland.

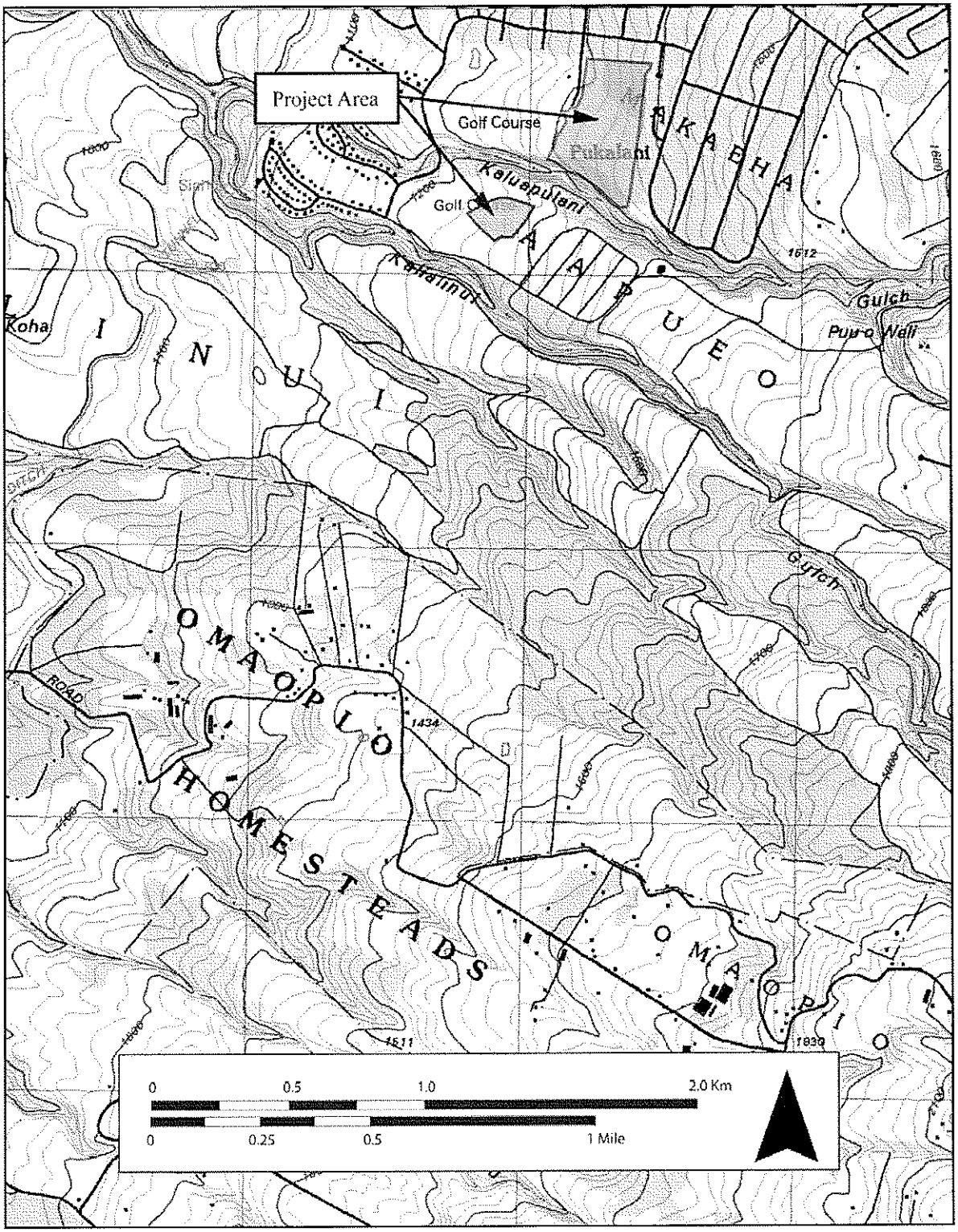

Figure 1: USGS Topographic Map Showing Location of Project Area

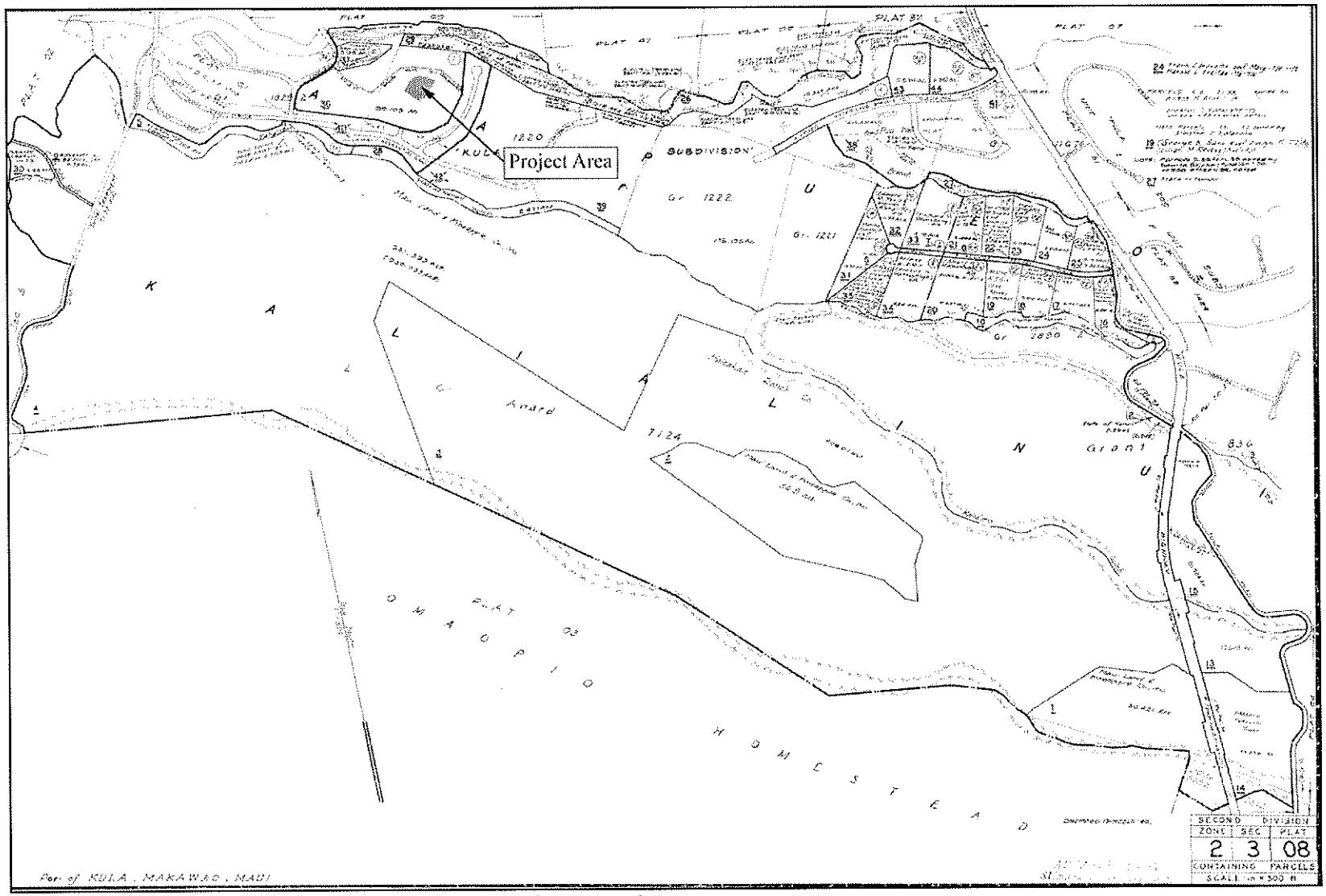

Figure 2: TMK: (2) 2-3-08 Showing Location of Southern Parcel.

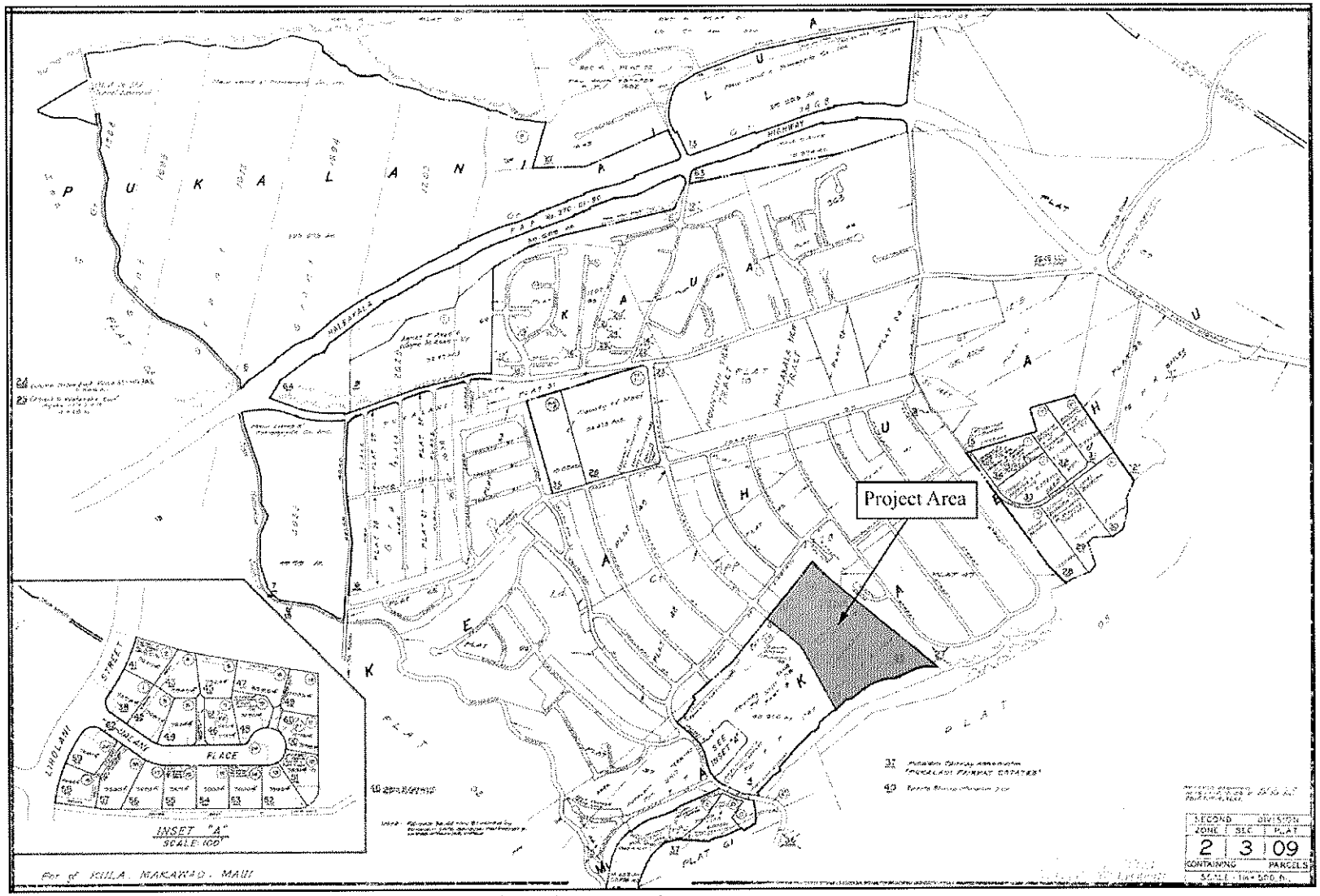

Figure 3: TMK (2) 2-3-09:39 Showing Location of Northern Parcel.

SOILS

Soils found within the project area are a part of the Keahua Series and are defined as Keahua silty clay, 7 to 15 percent slopes (KncC). These well drained soils were generally utilized for pineapple, pasture and homesites, with slow to medium runoff (Foote *et al.* 1972). The surface layer of Keahua Series soils are dark reddish-brown, with weak, very fine granular structure. Since the mid 19th century, agricultural and ranching activities have occurred in this area and within the last 50 years, mechanical grading activities have also altered the natural landscape. As a result, these land disturbances have altered the natural erosion patterns of the area.

RAINFALL

The project area is located on the northwestern slope of Haleakalā within East Maui. The area is subject to an average annual rainfall of about 76 to 152 centimeters (30–60 inches) (Armstrong 1983: 62). The wettest months fall between October and April and the rainfall flows northward. When northeast trade winds blow, the area receives a higher level of precipitation than when southerly, drier Kona winds blow.

VEGETATION

The project area is situated on fallow pineapple fields, last cultivated c. 1970. As a result, only introduced, invasive species are present. The vegetation is dominated by molasses grass (*Melinus minutiflora*), castor bean (*Ricinus communis*), and koa haole (*Leucaena leucocephala*). No native or endemic species were observed.

HISTORICAL BACKGROUND

TRADITIONAL LAND TENURE

According to Kamakau (1961), traditional Hawaiian land tenure was a system formed in order to care for the land. Around the fourteenth century, various individual island *mō`ī* (king/monarch) believed the land should be surveyed and permanently marked in order to institute a boundary system that would settle disputes between neighboring *ali`i* (chiefs). A *kahuna* (priest/expert) named Kālaika`ōhia is said to have carved the land into districts (*moku*) and numerous smaller divisions (*i.e.: ahupua`a, `okana* (district/subdistrict), *`ili* (subdivision), *etc.*) were coordinated. *Ahupua`a* land divisions vary in size, but generally encompass land from the mountain to the sea, thereby allowing access to marine and mountain resources.

The idea of holding land was not synonymous with owning it, but more like a trusteeship between the caretakers and the nature gods Lono and Kane (Handy & Handy 1972:41). The

ahupua`a is the most well known of all traditional land divisions and is still relevant today. Traditionally, the areas were governed by a designated caretaker (*konohiki*) and those residing within the region had designated access to all mountain and marine resources. Chinen (1961) explains that all chiefs and commoners were entitled to a portion of the mountain and marine resources.

Makawao District has changed significantly and the district boundary seems to expand with time. The establishment of new governmental forms in the mid-nineteenth century brought changes to the names and boundaries of old district divisions. Prior to 1848, the current Makawao District consisted of four traditional districts that included Honua`ula, Kula, Hāmākuapoko, and Hāmākualoa (Kame`eleihiwa 1992: 241). Presumably, each of those districts contained numerous *ahupua`a* that still retain the same name.

TRADITIONAL AND MYTHOLOGICAL ACCOUNTS

Place names in the area may help trace ancient Hawaiian perspectives toward individual areas. The district of *Makawao* literally translates to "forest beginning" (Pukui, *et al.* 1974:142). According to Sterling (1998: 99), the name *makawao* was derived from cloud formations in the area; *makao* means 'to be afraid' and *wao* means 'a cloud.' Maka`eha *(ahupua`a)* means "sore eye" and Pukalani translates as "heavenly gates" (Pukui, *et al.* 1974:34 and 193). Pukui, *et al.* (1974: 193) also note that the original name of Pukalani may have been "Pu`u-ka-lani", or "hill of the heavens", perhaps describing the afternoon cloud formations over the area. The place names of political entities were often derived from legends, significant events, or land features. The project area is situated within Maka`eha and `A`apueo *ahupua`a*. An example of this is the story of `A`apueo, the owl.

According to legend, a female owl lived in the upland of Kula during the reign of Kanenenuiakawaikalu (n.d.). A man named Kapoi from Wailuku smashed her eggs inciting a battle between the owls and the people of Wailuku. `A`apueo found revenge for the destruction of her eggs at the death of Kanenenuiakawaikalu during the battle (Uaua 1871:2). Thus, the origin of the name of one of the *ahupua`a* in this project area.

The sacred site of Pu`u Pane (southeast of the project area) is located in the *ahupua`a* of `A`apueo. Located on a crest of a hill, east of Haleakala Highway at approximately 2573 feet amsl, Pu`u Pane was described by M. Manu in an article in *Kuoko`a* (Feb 23, 1884 in Sterling, 1998). Manu stated that Pu`u Pane was declared by Kihapi`ilani as sacred and no commoner could climb the hill because it was a *heiau* for the high chiefs of Maui from ancient times to

Kihapi`ilani. A *kahuna* lived at `A`apueo to guard the hill. Several one-course high basalt rock alignments were identified on the hill in 1973 and may be the remains of the religious structure.

A small land division named Kohoilo located between Maka`eha-Keahua and `A`apueo Ahupua`a appears on a map surveyed between 1872-1879 by W. D. Alexander and M. D. Monsarrat. Within this section is a hill named Pu`u o Weli. Although distinctive in form, no traditional references were found associated with it except that it was included in Grant No.1829 held by an individual named Keawe in the 19th century.

In the uplands of the Kula District, at elevations higher than *c.* 1,000 feet above mean annual sea level, traditional agriculture was based on dryland field systems. Handy and Handy (1972: 488) write:

> The great bulk and altitude of Haleakala makes its southern flank practically a water less desert, and the southeast and west flanks relatively dry, so that there were no *lo`i* (pond fields) cultivation at all. The arid country below the west and south slopes of Haleakala, including Kula, Honua`ula, Kahikinui, and Kaupo, were dependent on sweet potato.

Handy and Handy (1972:131) also describe the planting methods in the drier sections of Kula:

> Where potatoes are planted in crumbling lava with humus, as on eastern Maui and in Kona, Hawaii, the soil is softened and heaped carelessly in little pockets and patches using favorable spots on slopes. The crumbling porous lava gives ample aeration without much mounding.

THE *MAHELE*

During the historic period, extreme modification to traditional land tenure occurred throughout all of the Hawaiian Islands. Kame`eleihiwa (1992: 209), states that the Makawao District was the first area in Hawai`i to experiment with land sales. In January 1846, land was made available for eventual ownership to the commoners (*maka`āinana)*. According to Chinen (1961), land was sold for $1.00 per acre; this would mark the beginning of land grants. Experimental lots purchased by Hawaiians ranged from five to ten acres, each with a total land area of approximately 900 acres. If applicants met all of the requirements (and were notified of the procedures), they eventually received the title to their land.

The transition from traditional Hawaiian communal land use to private ownership and division was commonly referred to as the *Māhele* (Division). The Māhele of 1848 set the stage for vast changes to land holdings within the islands as it introduced the foreign (western) concept of land ownership to the Islands. Although it remains a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kuykendall Vol. I, 1938:145 footnote 47, 152, 165–166, 170; Daws 1968:111; Kelly 1983:45; Kame`eleihiwa 1992:169–170, 176).

For natives that had been cultivating and living on the lands, lengthy and costly procedures enabled them to possibly claim some of the plots. The first Land Commission was formed in 1845, during which time all individuals holding land were required to submit their claims or forfeit their lands. Once lands were made available and private ownership was instituted the *maka`āinana* (commoners) were able to claim the plots on which they had been cultivating and living, if they had been made aware of the foreign procedures (*kuleana* lands, Land Commission Awards, LCA). These claims could not include any previously cultivated or presently fallow land, *`okipū* (on O`ahu), stream fisheries or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed Land Commission Award (LCA), issued a Royal Patent number (RP), and could then take possession of the property (Chinen 1961: 16).

The land that *maka`āinana* received was less than one percent of total lands, all of which needed to be surveyed. A total of 88,000 people submitted 14,195 requests for land and of these only 8,421 were awarded. (Kame`eleihiwa 1992: 295). In 1850, it became legal for foreigners to purchase land and they received large portions for diminutive prices. At this time, many Native Hawaiians lost access to their lands due to mortgage default.

According to the Waihona `Aina Database, an online record of Hawaiian landholdings, no LCAs were awarded in the project area.

HISTORIC PERIOD

Much like the rest of Maui, Makawao District was a site of sugar and pineapple production. However, cattle ranching became a prominent position of employment and adopted lifestyle. Livestock was introduced to the Hawaiian Islands in 1793 when Captain Vancouver transported cattle and sheep aboard his ship the *Discovery* with the intention of giving the four cows, two bulls, four ewes, and two rams to Kamehameha I as a gift of goodwill. The rough seas

and intense heat of the journey took its toll on the health of the cattle and several of the animals died. In order to ensure that the cattle population would increase, a ten year *kapu* (ban) was placed on slaughtering them. Eventually the cattle did increase in number to the point of becoming a dangerous nuisance. As they were allowed to roam wild, gardens were destroyed and the Native Hawaiians were terrified of being attacked. Managing and controlling the unruly animals became a necessity. In order to solve this problem Kamehameha I employed "a varied crew with unsavory reputations who had immigrated to the islands to escape their pasts" as *bullock hunters* to capture the animals (Cowan-Smith and Stone 1988:8).

Things were about to change in 1803 when Captain Richard Cleveland and his partner Captain William Shaler introduced horses to the Islands. These men brought aboard their ship, the HMS *Lelia Byrd*, several horses including a stallion and a mare with foal which they presented as gifts to Kamehameha. Soon the horses, like the cattle, were roaming freely across the Islands. The horses (*lio*) adapted rapidly to the rough terrain where the cattle grazed and "their ability to work the livestock [did not] go unnoticed" (Cowan-Smith and Stone 1988:12).

Around 1830, Kamehameha III brought Mexican *vacqueros* from Vera Cruz to the Big Island to teach the local men how to rope and handle the animals. As the cattle and horse populations proliferated, the animals were transferred to the various Hawaiian Islands and the *vacqueros*, which now included local cowboys, were needed on the outer islands.

In addition to cattle ranching, agricultural activities were pursued. Despite claims that "the soil in this area of Maui grows rocks" (Fredericksen, *et al.* 1991: 05) due to the many areas of exposed bedrock and scattered boulders and gravels in the surrounding fields, oral accounts of historic agricultural endeavors listed crops such as sweet potato (*`uala; Ipomoea batatas*), potatoes, corn, beans, and wheat, which had expanded exponentially in the first half of the nineteenth century (Fredericksen *et al.* 1991: 03–05; Sterling 1998: 99; Bartholomew 1994: 120). The area which had once been "developed as an agricultural and stock-raising area" had expanded "into pineapple upon the formation of the Pukalani Dairy and Pineapple Company in 1907" (Bartholomew 1994: 121). By the nineteenth century, sugarcane and pineapple proved profitable crops; patches of the crops still exist in the upcountry areas today.

MODERN USE

In 1970 Pukalani Golf Course was constructed, dramatically altering the surrounding landscape. Prior to the development of the land and surrounding parcels, the current project area was under intensive pineapple cultivation.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Several archaeological surveys have been conducted in the vicinity if the current project area. Figure 4 illustrates the overlap of surveys and identified sites located in the vicinity of the project area. Figure 5 shows archaeological research associated with the Pukalani Highlands property located approximately 1 km northeast of the current study parcels.

In 1973, Connelly re-identified Site 50-50-05-1062 under the direction of Bernice Pauahi Bishop Museum. The area consisted of a traditional petroglyph site containing at least 87 glyphs within the northern section of Kaluapulani Gulch. Site -1062 is located west of Kula Highway near the present upcountry location of Kamehameha Schools. The site was relocated as part of an Archaeological Reconnaissance Survey for the proposed Kīhei to Kula Road corridors (Folk *et al.* 1999).

Bordner, in affiliation with the Environmental Impact Statement Corporation, conducted a Reconnaissance Survey of the proposed Makawao Subdivision (1980). The project area, which was located between Kailua Gulch and Apana Road, was said to have been a plantation camp. However, no archaeological surface remains were located during the survey and no further work was recommended.

Donham (1990), in association with Paul H. Rosendahl Inc. (PHRI), conducted an Archaeological Inventory Survey for five potential upcountry Maui High School sites in Hali`imaile, Hoku`ula, Kailua and Maka`eha Ahupua`a, Makawao District. Historic materials and traditional Hawaiian artifacts were discovered during this project: Parcel 1 contained ceramic shards; Parcel 2 contained a horseshoe and metal; Parcel 3 contained water-worn coral and marine shell; and Parcel 4 contained four lithic artifacts and a ceramic shard. Even though cultural remains were located on some of the investigated parcels, no State Site Numbers were issued for any of the findings. No further work was recommended for Parcels 1–3 and 5; however, further research was warranted for Parcel 4.

Donham (1991) performed an Archaeological Field Inspection of petroglyphs located near the Kula 200 Subdivision. The petroglyphs were identified on a vertical rock face along the north section of Kaluapulani Gulch, the same location as Site 50-50-05-1062. At least 32 additional individual rock drawings were recorded across a section of 20 meters.

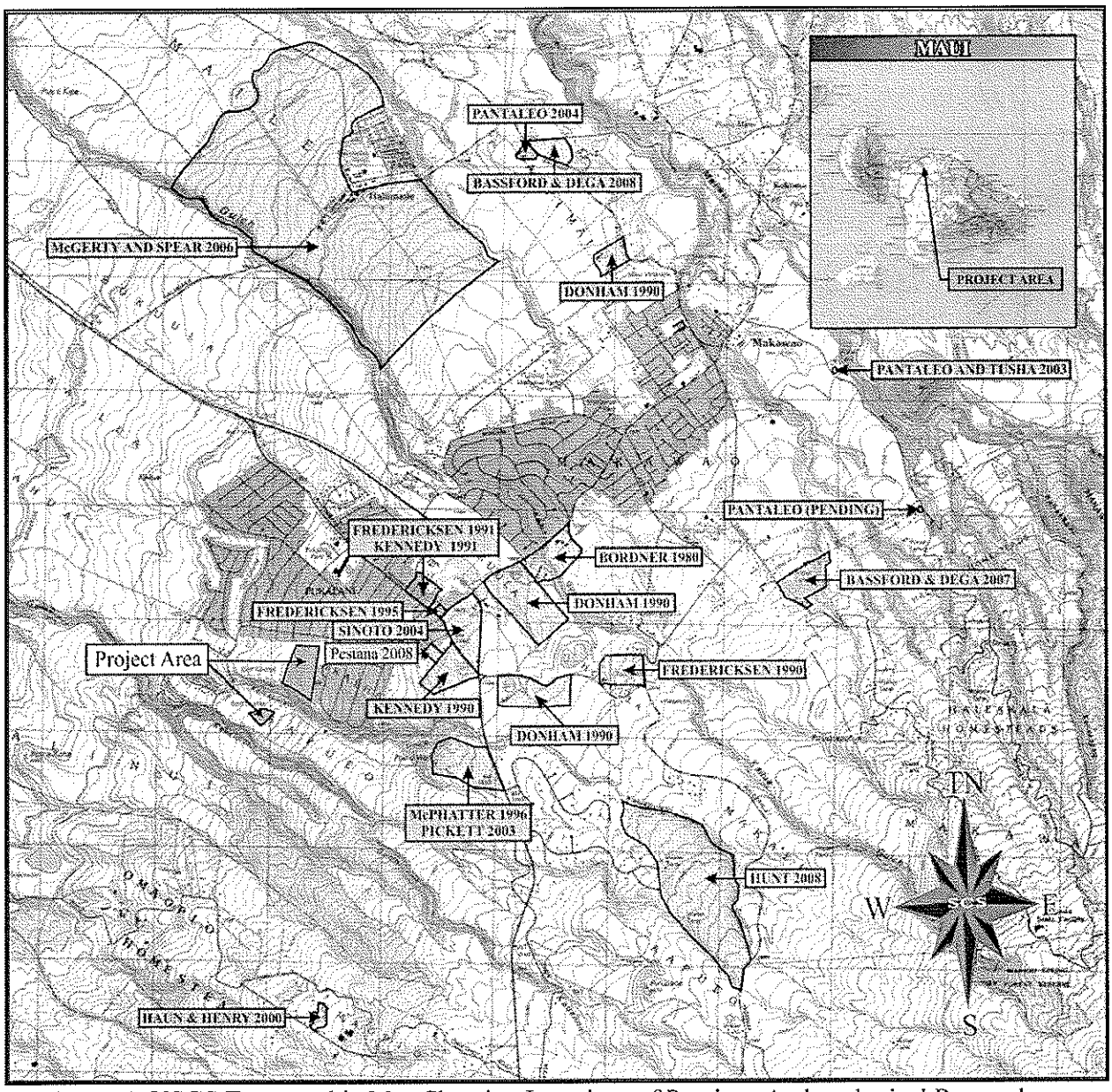

Figure 4: USGS Topographic Map Showing Locations of Previous Archaeological Research.

Xamanek Researches conducted an Archaeological Inventory Survey in Hoku`ula Ahupua`a, Makawao District (Fredericksen and Fredericksen 1995). A rock aggregation was recorded and issued SIHP Site Number 50-50-05-3929. Testing resulted in the discovery of historic materials including metal, bottle glass, agricultural sheeting, cut animal bone, and ceramics. Traditional Hawaiian artifacts consisted of *kukui* nut *(Aleurites moluccana)*, water-worm pebbles (*`ili`ili* stones) and marine shell. No additional archaeological work was required for the site.

Xamanek Researches conducted an Archaeological Inventory Survey for the Kulamalu water tank and water line improvements in Hoku`ula Ahupua`a, Makawao District (Fredericksen and Fredericksen 1999). Five archaeological sites were identified and each was issued a SIHP Site number. Site 50-50-10-4677 through -4681 consisted of two historic retaining walls, two shelter caves and a probable historic grave site. The sites were not to be affected by the proposed work and no further investigations were deemed necessary.

PHRI conducted an Archaeological Inventory Survey for the proposed Pukalani Terrace Subdivision III in `A`apueo Ahupua`a, Makawao District (McPhatter *et al.* 1996). During this survey, additional petroglyph panels were documented in Kaluapulani Gulch. The glyphs are located on the south bank of the gulch and were issued Site 50-50-05-4179. There was also a rock wall identified (Site 50-50-05-4180) and agricultural terraces (Site 50-50-05-4181). No additional work was required for the wall and terraces; however, permanent preservation was recommended for the petroglyph panel.

Aki Sinoto Consulting completed an Archaeological Inventory Survey of the proposed Upcountry Town Center (Sinoto and Pantaleo 2002). The historic Corn Mill Camp was identified and issued Site Number 50-50-06-5169. Anything associated with the historic camp was recommended for permanent preservation.

Archaeological Services Hawai`i, LLC recorded a Chinese Cemetery while monitoring the construction of Kulamalu Commercial Subdivision in `A`apueo Ahupua`a. No archaeologist was on site during the excavations; however, a construction supervisor contacted the archaeological firm upon the discovery of disturbed human bones. The site contained coffin and burial pits, burning episodes, animal burial, associated historic glass bottles and beads. The site was slated for permanent preservation (Pickett and Pantaleo 2003).

Archaeological Services Hawai`i, LLC recently recorded a human burial during trench excavations along an access road in a pineapple field. However, no archaeologist was on site during the trench excavations and a Maui Pineapple Company Field Supervisor contacted the state upon the discovery of human bones. The burial was partially disturbed and later re-interred and slated for permanent preservation. Maui Pineapple Company re-routed the trench to go around the burial, and it is presently marked with an upright basalt stone.

Pantaleo and Tusha (2003) completed an Archaeological Inventory Survey for the proposed Pi`iholo water well (TMK 2-4-12: portion of 6). Nothing of archaeological significance was identified.

Pantaleo (2004) prepared an Archaeological Inventory Survey report of the Taylor-Fewell subdivision and Grove Ranch Agricultural Subdivision in Hāli`imaile [TMK: (2)-2-4-1-:004, 019). Two archaeological sites were give numbers 50-50-06-5554 and -5555. The sites consisted of a Portuguese ferno (Site -5554) and a historic cattle scale (Site -5555). Since historic remains were encountered, Archaeological Monitoring was recommended.

In 2006, SCS conducted an archaeological inventory survey of 180 acres of land approximately 3 km southeast of the current project area. Systematic pedestrian survey of the project area led to the identification of four single-feature archaeological sites, all of which were located in a northern fork of Kalialinui Gulch (upslope of current study area). The sites have been designated as State Site No. 50-50-11-6214 (modified outcrop), State Site No. 50-50-11-6215 (L-shaped wall), and State Site No. 50-50-11-6216 (wall), and State Site No. 50-50-11-6216 (wall). In addition, 18 backhoe trenches were excavated on the tablelands of the project area during which no sites or cultural deposits were identified.

PUKALANI HIGHLANDS PROPERTY

In March 1991, an Archaeological Inventory Survey for the proposed Pukalani Highlands Property was completed by Archaeological Consultants of Hawai`i, Inc. (TMK: 2-3-44: 20) (Kennedy 1991). A total of three structures were recorded; four test units were excavated. According to Kennedy, evidence collected suggested the structures (referred to as "mounds") were pre-Contact as all historic materials (*e.g.*, wire, nails, bovine teeth, a plastic bottle) were all collected at least 14 cm above the base of the structures and because the rock walls were stacked and faced, rather than being reinforced by concrete.

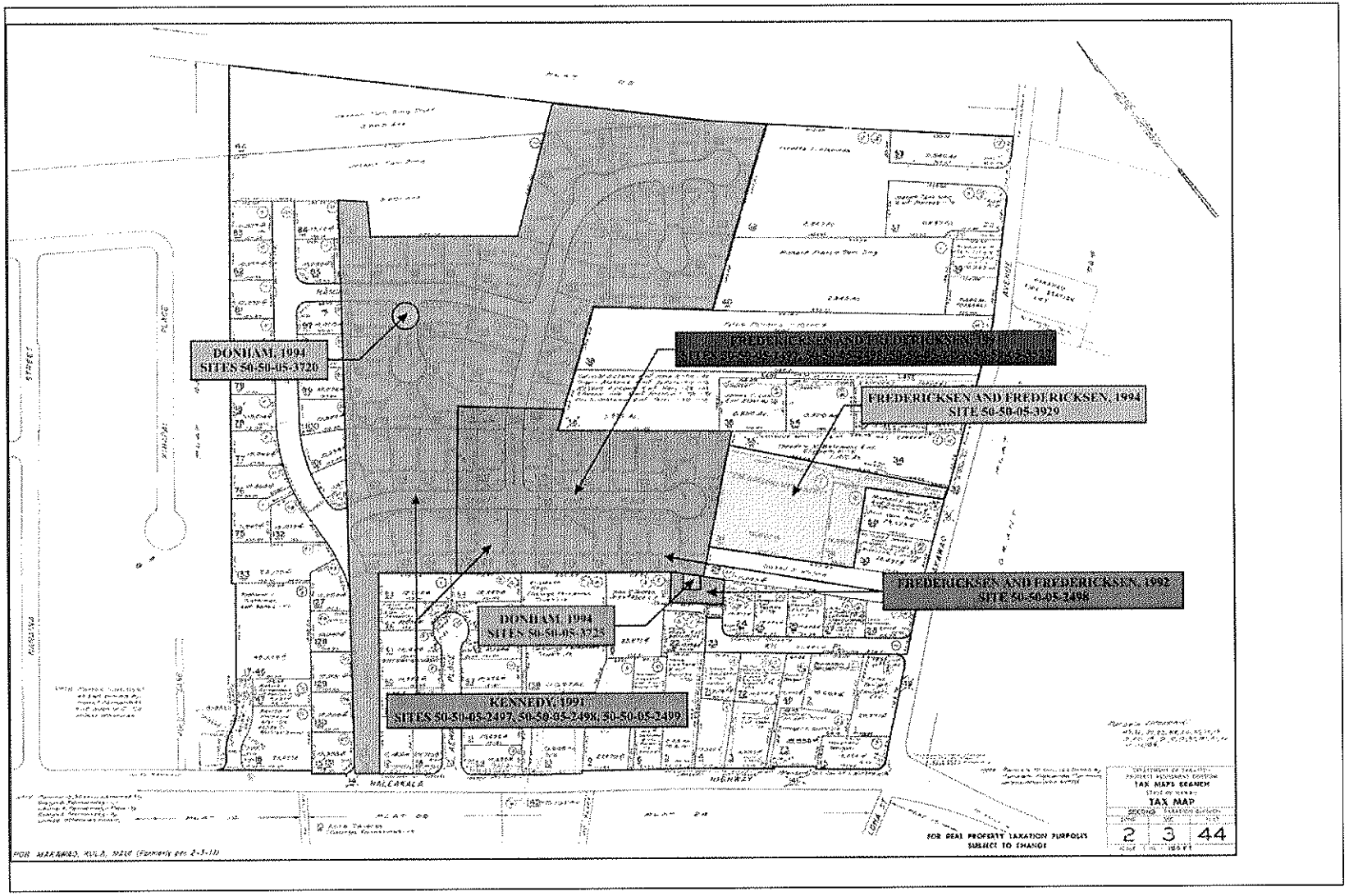

Figure 5: Previous Archaeological Studies in TMK 2-3-44.

Site 50-50-05-2497 was concluded to be a *heiau* (shrine, temple) due to the structure's formal construction, while Site 50-50-05-2499, not as well constructed as Site -2497, was determined to be a burial due to its close proximity to Sites -2497 and 50-50-05-2498. Oral accounts of the structure and its formal construction led Kennedy to conclude that Site -2498 was a *heiau*. Volcanic glass considered to be prehistoric was found below historic materials. In addition, coral found on the platform and in a test unit furthered the belief that the site was a *heiau*, "for there are ethnographic accounts of fist sized chunks of coral being brought to and used as offerings on such structures" (Kennedy 1991: 27). Preservation efforts were recommended for Site -2497 due to its excellent condition and cultural value; Data Recovery was recommended for Sites -2498 and -2499 due to their potential to yield cultural data (and also an examination of the stone wall, which is absent from Kennedy's report).

Sites -2497, -2498, and -2499 continued to be of interest and generated much controversy. In June 1991, Xamanek Researchers tested Site -2499; preliminary excavations suggested the feature was the result of modern agricultural clearing activities (Fredericksen, *et al.* 1991). The stone alignment, absent from Kennedy's 1991 report, was deemed State Site 50-50-05-3527. The alignment was composed of "angular, quarried rocks intermixed with boulders and cobbles" (*ibid*: 07). A 2.0 by 3.0 m area 5.0 m north of Site -2497 was cleared and a small piece of coral, some concrete, and rusty metal pieces was recovered. Pieces of a concrete irrigation flume were found west of Site -2497. A trench *makai* of the bedrock at Site -2499 was excavated in order to determine if the feature covered an old lava tube which might contain a burial. Pre-Contact artifacts were recovered: a round stone, possibly "crude or unfinished *pohaku hu* (a rock used to snare birds, according to Brighman in Fredericksen, *et al.* 1991: 08), charcoal, several coral chunks, *kukui* (candlenut tree; *Aleurites moluccana*) shell fragments, an adze tip, two polished adze flakes, basalt flakes, and a possible hammerstone and polishing stone.

Historic artifacts were also noted: metal nails, cut bovine bone, glass sherds, rusty metal, and wire. Xamanek Researchers concluded that Site -2499 is not a lava tube and that the mix of artifacts infers activities from both pre- and post-Contact eras. Radiocarbon dating from Site -2498 was dated at 1540 to 1680; Site -2499 returned a date of 1620 to 1750. The location may have been chosen as a "repository of stones because it is an outcrop of rock which could not be utilized in other ways" (*ibid*: 10). Oral histories of the area confirmed agricultural cultivation and clearing occurred for many years "in recent times" (*ibid*). It was recommended that further excavation on the *mauka* sides of Sites -2497 and -2498 was needed to obtain more data and that

the placement and location of the two sites was "problematic" – they may be historic clearing piles, pre-Contact religious structures, or a combination of prehistoric and historic sites.

In January 1992, Xamanek Researchers began "dismantling work at Site 2498" (Fredericksen and Fredericksen 1992: 02). More historic articles and a charcoal layer were encountered. Bone was hit by a dozer and the disarticulated remains of seven individuals were identified and disinterred. One adult coffin burial was determined to be a primary interment, all others (three adults, two infant, and one child) were secondary interments; brought from "somewhere else" (*ibid*: 14). After conferring with SHPD, the remains were moved to Lot 60, which was located on an easement that could not be developed. Monitoring and further excavation were recommended in order to explore the site and stone alignment further.

Excavations occurred at Site 50-50-05-3929, a rock aggregation at TMK: 2-3-44: 31 (Fredericksen and Fredericksen 1994). Modern trash material was noted: rusty metal, plastic, black plastic mulch associated with historic agricultural practices, and bottle glass. No significant finds were made; no further work was recommended.

In February 1994, the SHPD and Maui/Lāna`i Island Burial Council (MLIBC) was notified of an inadvertent discovery of human skeletal remains at the Pukalani Highlands Subdivision (TMK: 2-3-44: 19). The remains (Site 50-50-05-3520) were uncovered when a section of a trench wall collapsed: "The disposition of the remains *in situ* indicated that the elements were not articulated and that the burial had been disturbed prior to its recent exposure during construction" (Donham 1994: 01). Due to the location of the remains in an area of likely future disturbance, the decision was made to relocate the remains to Site 50-50-05-3725. Historic period fragments not associated with the burial were also present. Scattered charcoal was interpreted more as a by-product of crop burning (*i.e.*, sugarcane).

Xamanek Researchers summarize other sites in the vicinity of the project area (Fredericksen and Fredericksen 1994) include Site 50-50-05-3426, an agricultural clearing pile from the historic period, as suggested by the presence of black plastic, common in cultivation pursuits. Site -3527 was a stone feature; it was believed to be part of the roadway, perhaps Paku Lane. In May of 1990, Kennedy identified a stone feature, which he determined to be a *heiau*, in a pineapple field (Site 50-50-05-2701). Excavations outside of the feature included volcanic glass, basalt flakes, and *kukui* nut shells. Radiocarbon dating suggested a construction sate of 1620 to 1770.

Previous documentation regarding Site 50-50-10-2701 (the previously-discussed *heiau*) required further investigation on the land parcel. Archaeological Services Hawai`i, LLC conducted an Archaeological Inventory Survey of the Kualono Residential Subdivision in Pukalani (Pantaleo 2004). A total of 26 backhoe trenches were excavated and no culturally significant findings were encountered during subsurface testing. Approximately 2.5 acres were set aside from the proposed development in order to preserve the site. Archaeological Monitoring was recommended.

In all, a survey of previous archaeological undertakings in the area suggest that this area of upcountry Maui may have been utilized in pre-Contact times—with use that extended into the historic period. The gathering of upland resources in traditional times seems more likely, rather than more permanent habitation and agricultural practices, like those in the Kēōkea-Waiohuli areas. Although habitation is suggested by the presence of petroglyphs and ceremonial structures, more evidence is needed to support this claim, especially in the Pukalani area.

SURVEY EXPECTATIONS

A review of archival resources and the results of previous archaeological work conducted in the area were undertaken prior to fieldwork to assess expectations for the project area. Although pre-Contact sites do exist in the area, given the background history of the area as well as present land use, the expectations for finding post-Contact sites were greater than expectations for finding pre-Contact sites. Historic sites (*i.e.*, roads, irrigation features, fences, house sites, etc.) associated with commercial agricultural activities were anticipated; with a very slight chance of encountering agricultural features including terraces, garden/animal enclosures, walls, and mounds. In summary, the estimated probability of documenting historic sites was low; the estimated probability of documenting pre-Contact sites was almost nonexistent.

METHODOLOGY

Two field tasks were completed during the archaeological assessment of the approximate 36-acre study area. These included a systemic, 100% pedestrian survey and backhoe subsurface testing to document any possible buried cultural layers or materials. Fieldwork was conducted on October 25-27 by SCS archaeologists David Perzinski, B.A. and Ian Bassford, B.A. (Field Supervisor) under the overall direction of Robert L. Spear, Ph.D., Principle Investigator.

First, a full systematic pedestrian survey, providing 100 percent coverage of the entire project are a was conducted in sweeps 5 meters apart, depending on vegetation density and terrain, in order to identify any archaeological structures or surface scatters and to assess geographical and topographical features. Second, 13 stratigraphic trenches were mechanically

excavated with a backhoe to record the stratigraphic sequence and to possibly identify any subsurface sites. All thirteen trenches were recorded for their stratigraphic content and photographed. The stratigraphy of the trenches was thoroughly documented, using the *Munsell Soil Color Charts* (1990) to identify structure and color of subsurface strata. Due to the extremely uneven terrain, backhoe trenching was not possible in the northern half of the northern portion of the project area (Figures 6, 7, 8, and 9).

FIELD RESULTS

No new sites, surface features, or midden scatters were identified during the pedestrian portion of the AIS. The entire project area was subjected to a 100% pedestrian survey and 13 mechanically excavated trenches were examined to determine the presence or absence of subsurface cultural materials or layers.

The pedestrian survey was conducted on both the northern and southern project areas (see Figure 6). The northern half of the larger, northern portion of the project area is heavily vegetated with abundant construction debris, push piles, steel pipe, and green waste and was inaccessible to the backhoe. It appeared that the debris and push piles were associated with construction of the residential housing and golf course, though it is also likely that the area was used as a dump for area residents. The southern half of the northern project area was relatively flat, with thick *koa haole* and invasive grass covering the entire area.

Across both portions of the project area, the subsurface stratigraphic sequence consisted of a previously disturbed "till" zone approximately 50 cm deep overlying the naturally occurring silty clay. No traditionally Hawaiian cultural materials were encountered, with only modern debris (plastic sheeting, golf balls) encountered within the trenches. Because of the similarity of the strata encountered across the project area, the following text describes three of the trenches excavated within the project area that serve to represent the whole variation.

In the northern portion of the project area, Trench 1 consisted of a 40-50 cm thick layer of dark brown (10 YR 3/3) hard silty loam that represents the agricultural "till" zone (Figures 10 and 11). The stratum contained abundant pebbles, roots and rootlets with an abrupt and wavy lower boundary. Stratum II consisted of dark brown (10 YR 3/3) hard, bouldery and cobbly, sterile silty clay. This description also applies to Trenches 2, 5 and 10. Trench 6, excavated in the south central portion of the northern project area consisted of a 40-50 cm thick layer of dark brown (10 YR 3/3) hard silty loam that again represents the agricultural "till" zone (Figure 12). Stratum II consisted of very dark gray (7.5 YR 3/1) silt loam with weak, fine granular structure. The stratum was sterile with only few roots and rootles and decomposing bedrock encountered within the stratum. This description also applies to Trenches 3, 4, 7, 8 and 9.

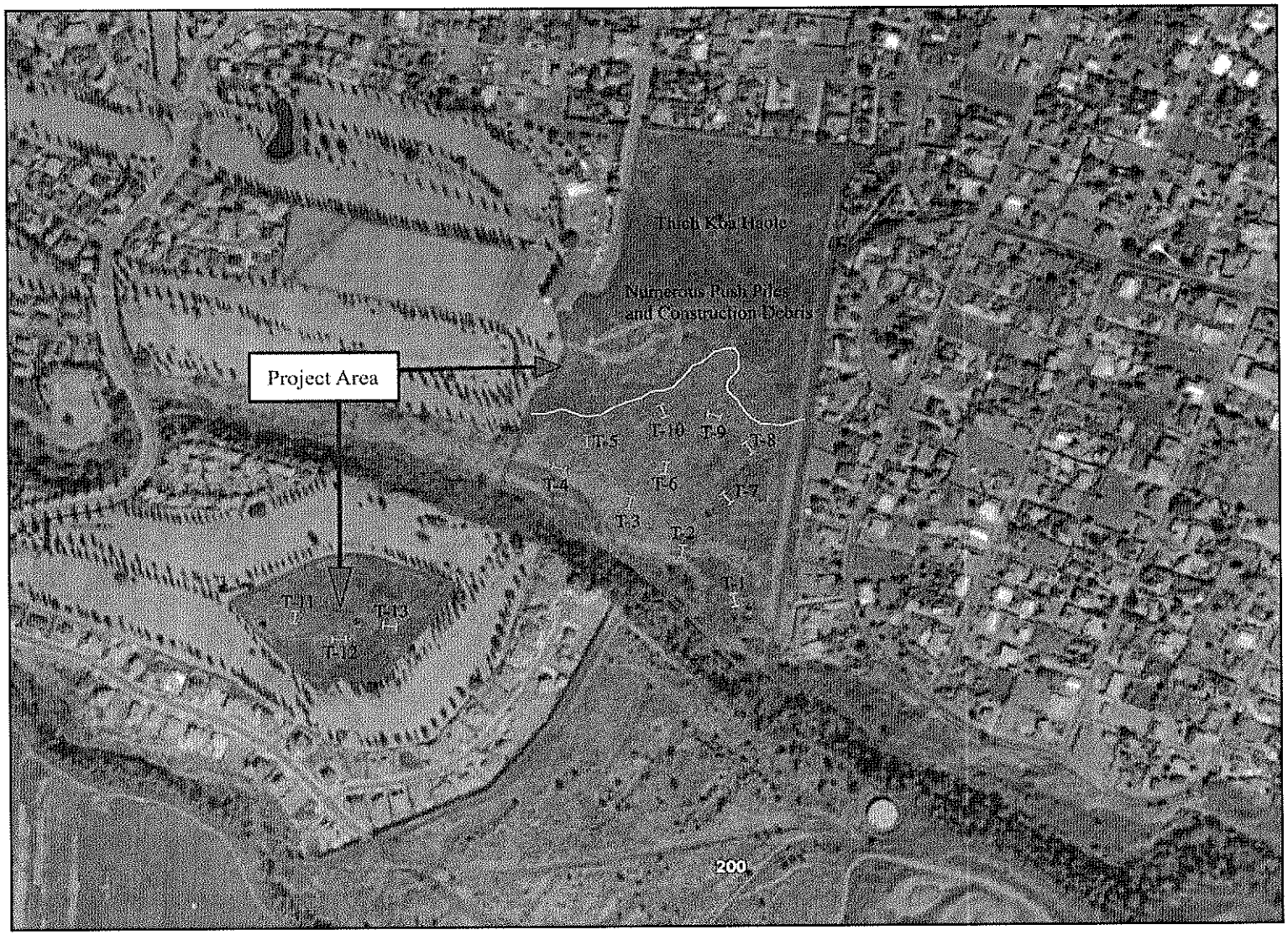

Figure 6: Aerial View of Study Areas Showing Location of Trenches with Yellow Line Demarcating Area of Terrain Inaccessible to the Backhoe. Only the area north of this yellow line will be subject to Archaeological Monitoring once development commences.

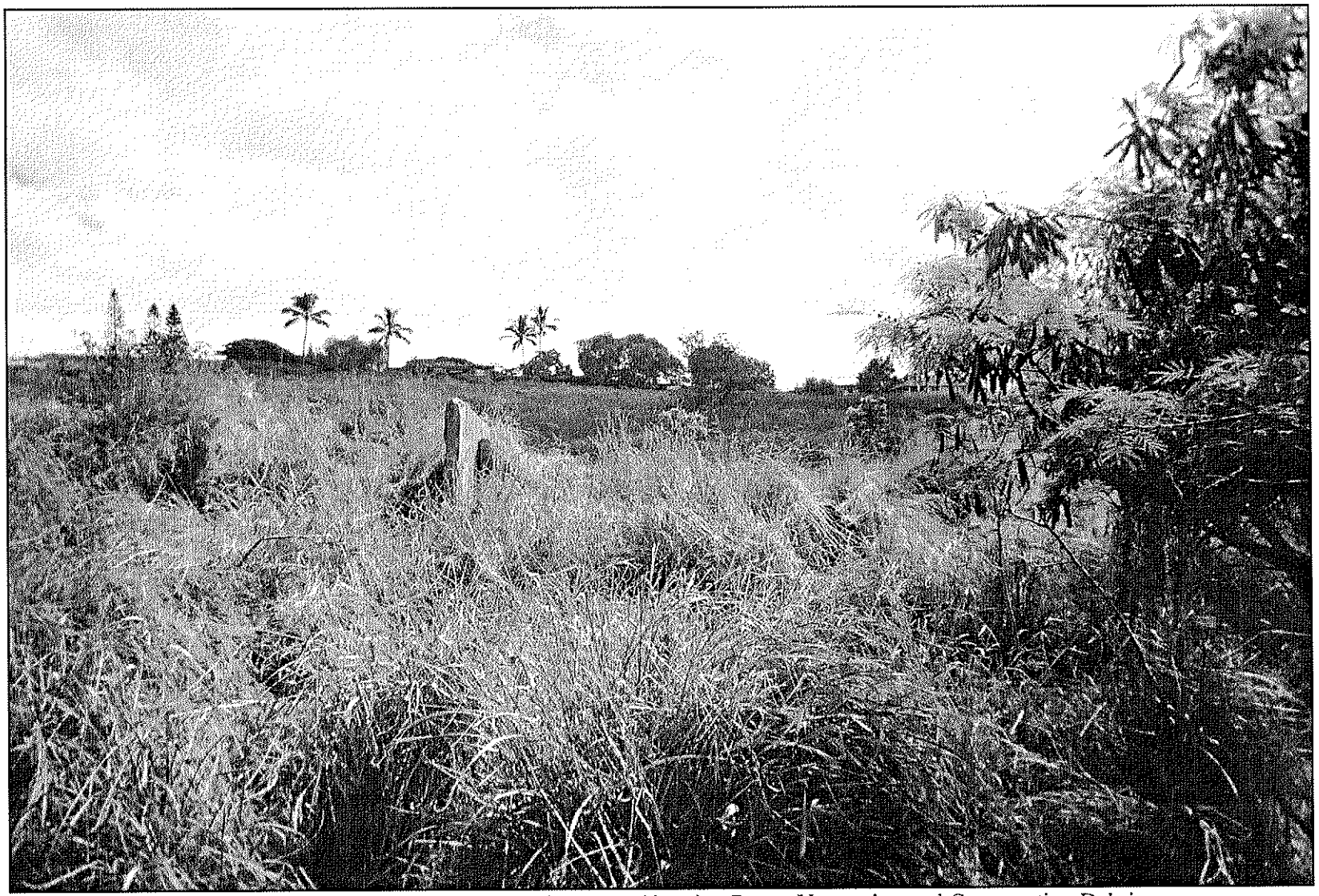

Figure 7: View Northeast from Center of Northern Project Area Showing Dense Vegetation and Construction Debris.

Figure 8: View South from Northeastern Corner of Northern Project Area.

Figure 9: View West of Southern Project Area.

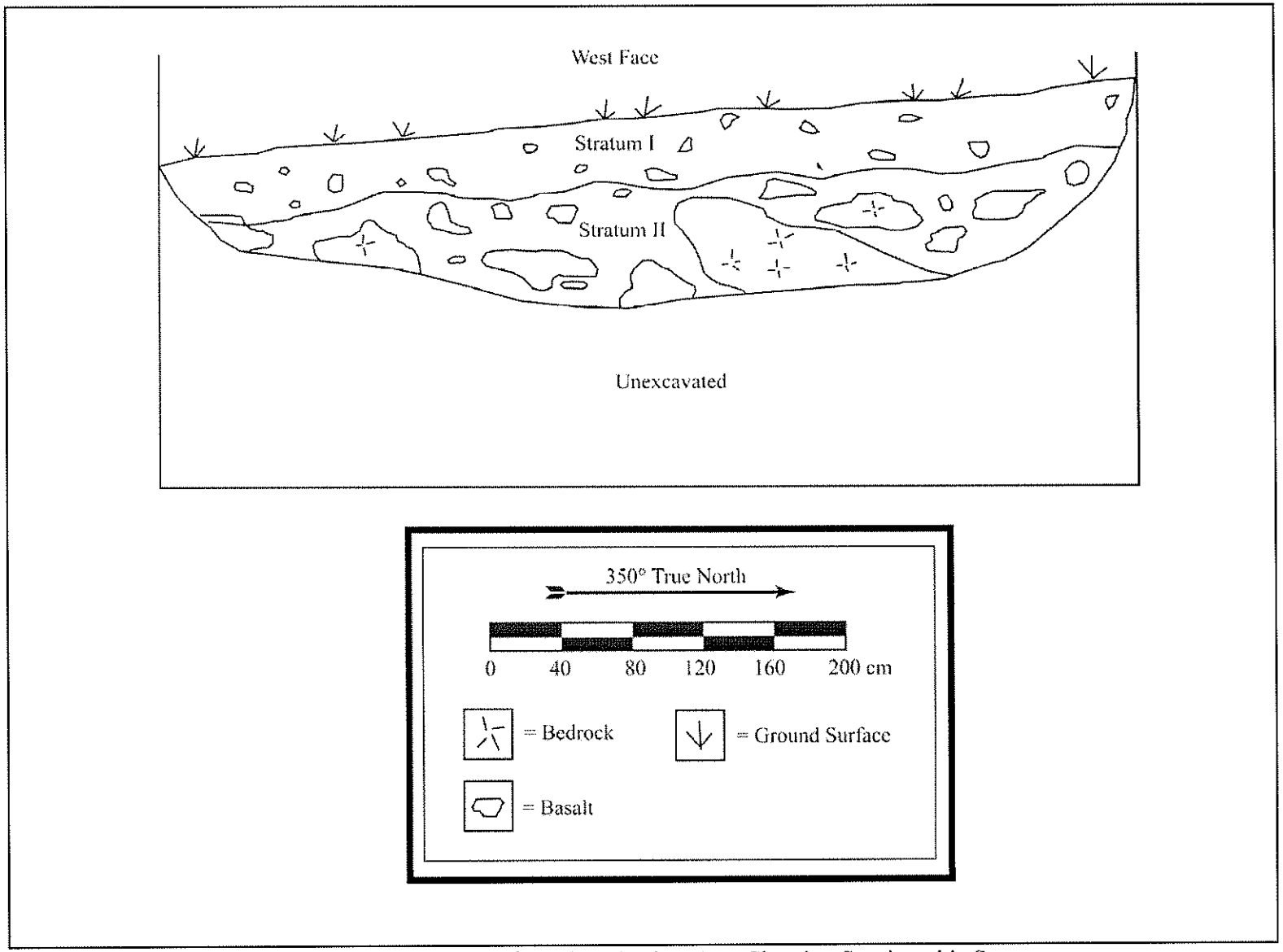

Figure 10: Profile of Trench 1 in Southwest Corner of Northern Project Area Showing Stratigraphic Sequence.

Figure 11: View West of Trench 1 Showing Sterile Strata (note clumpy Stratum I "till" zone from previous agriculture use).

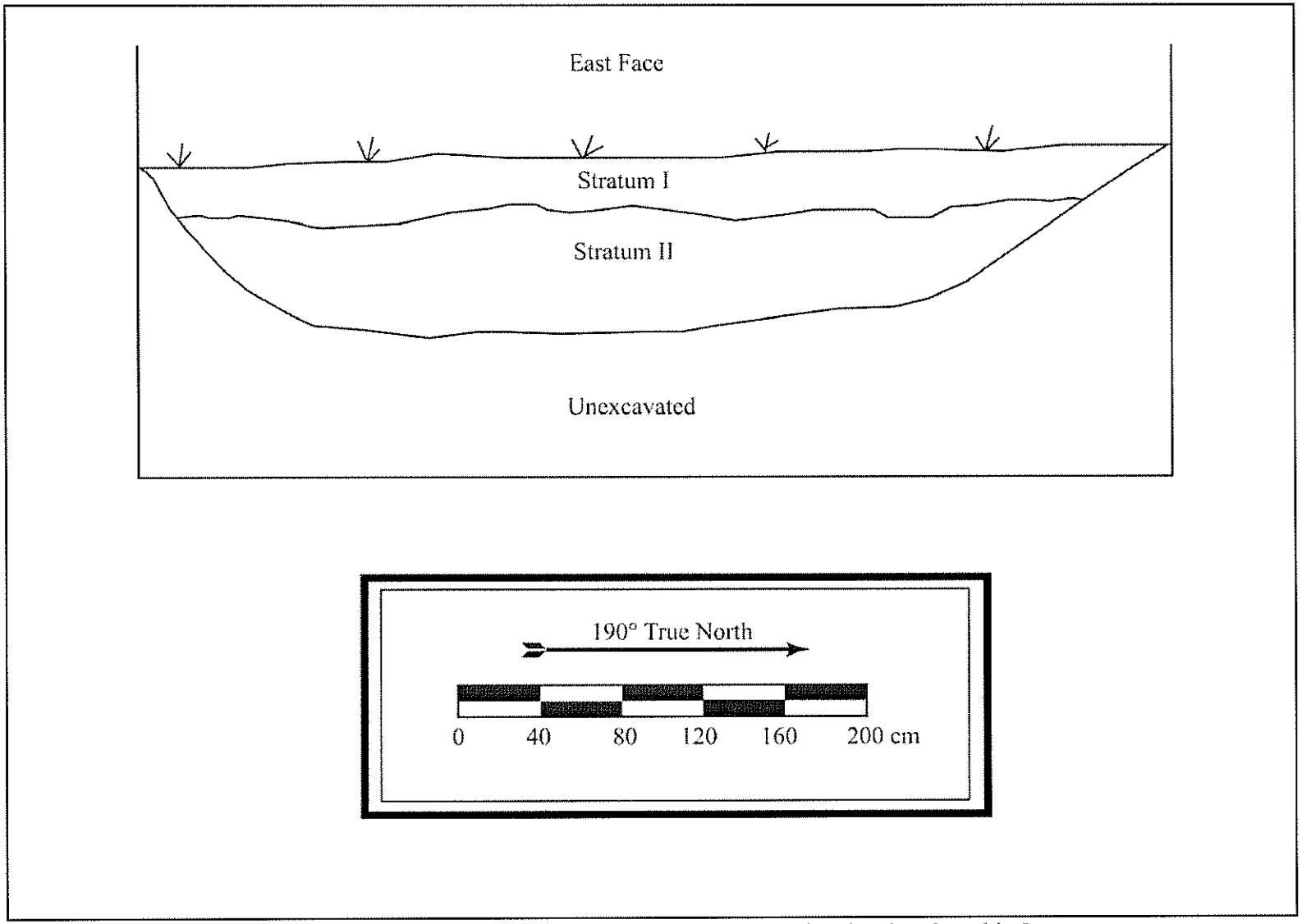

Figure 12: Profile of Trench 6 in South-central Portion of Northern Project Area Showing Stratigraphic Sequence.

In the smaller, southern portion of the project area, three trenches, all identical in their stratigraphic sequence, were excavated (see Figure 6). Trenches 11-13 had Stratum I consisting of dark reddish brown (5 YR 3/3) structureless silt and silt loam with black plastic sheeting inclusions and a clear and smooth lower boundary (Figure 13). SCS interprets that Stratum I represents the former "till" zone of former pineapple cultivation. Stratum II consisted of dark reddish brown (5 YR 3/4) silty clay with strong, fine to medium granular structure. The stratum was sterile and likely represents the naturally occurring deposit.

In sum, no cultural materials or layers were encountered during subsurface testing. Previous grading and dumping activities for the golf course and surrounding residential areas likely destroyed any surface deposits and possibly any near surface cultural deposits or artifacts.

CONCLUSIONS

No surface or subsurface cultural remains were identified during this AIS fieldwork. A 100% pedestrian survey and the excavation of 13 backhoe trenches within the parcel did not lead to the identification of surface features or subsurface sites or layers. Modern-era clearing and grading in the parcel for the golf course and a surrounding residential community likely removed any previously existing surface sites and destroyed or altered subsurface deposits—if they existed within the project area.

SCS estimates, based on this Archaeological Assessment, that the proposed development has a low likelihood of adversely impacting any historic properties. Though no subsurface historic properties were encountered within this project area, the presence of human remains and a *heiau* encountered less than 1 km away suggests that finding subsurface historic properties in this area remains possible. SCS test excavations recorded no subsurface features within 13 trenches in the southern parcel portions, and revealed a degree of prior earth disturbance that would render subsurface deposits unlikely. Additionally, the volume of tested ground was deemed sufficient to safely say that no further archaeological work is required within tested portions of the project area.

However, the northern half of the larger, northern portion of the project area is heavily vegetated with abundant construction debris, push piles, steel pipe, and green waste; and was inaccessible to the test excavation backhoe. Therefore, due to the low probability, yet remaining possibility of future finds here, Archaeological Monitoring is recommended during all ground disturbing activity within this particular section of the project area (see Figure 6). SCS recommends an Archaeological Monitoring Plan be SHPD-approved prior to any earth moving on the parcels.

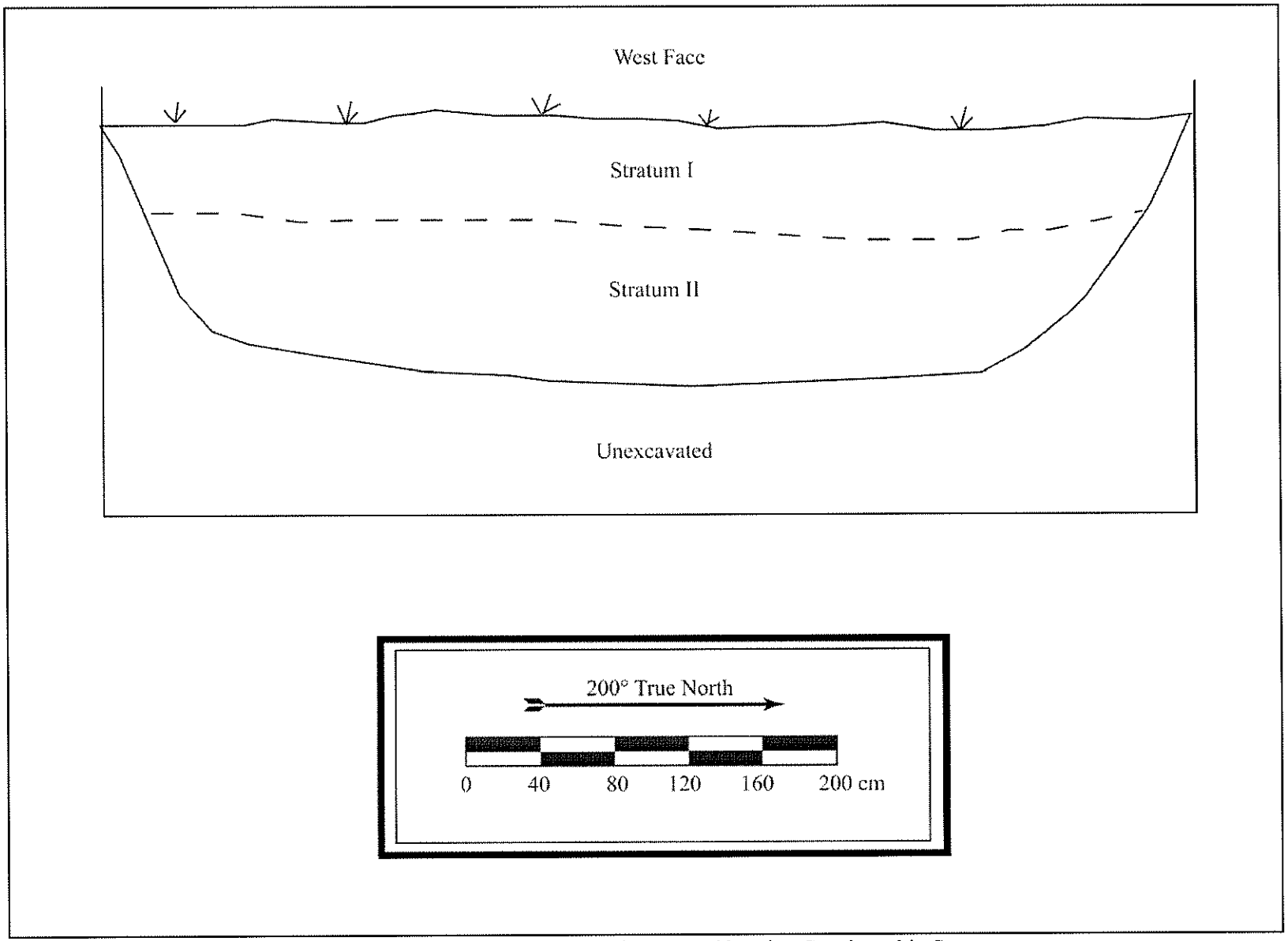

Figure 13: Profile of Trench 11 in West Portion of Southern Project Area Showing Stratigraphic Sequence.

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APPENDIX C-1.

State Historic Preservation Division Approval Letter

SCS 1096

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

February 12, 2010

Robert L. Spear, Ph.D.
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 975
Honolulu, Hawai'i 96813
shpdreply@scshawaii.com

LOG NO: 2010.1139
DOC NO: 1002PC08
Archaeology

SUBJECT: **Chapter 6E-42 Historic Preservation Review – REVISED Archaeological Assessment Report for Approximately 36 Acre Residential Subdivision A'apueo/Maka'eha Ahupua'a, Makawao District, Island of Maui**
TMK: (2) 2-3-008:036 por.; (2) 2-3-009:039

Thank you for the opportunity to review this revised report, which our staff received in PDF format on February 2 (Perzinski and Spear): *An Archaeological Assessment on Approximately 36 Acres for a Residential Subdivision*...Scientific Consultant Services, Inc.

The report was first reviewed by SHPD staff on January 30 (SHPD LOG NO: 2010.0198; DOC NO: 1001PC30), resulting in two requested revisions.

The survey area as described in the report is comprised of a 5.5 acre portion of TMK (2) 2-3-008:036 and the entirety of TMK (2) 2-3-009:039 (30.457 acres). Both parcels are owned by KG Maui Development, LLC. Fieldwork, undertaken between October 25 and 27 of 2009, was comprised of a 100% pedestrian survey of the project area and 13 mechanically excavated trenches to examine subsurface stratigraphy. The survey conducted for the current project produced no new or previously recorded surface visible culturally significant historic properties, effectively turning the inventory survey into an assessment.

The report now contains the required information as specified in HAR §13-276-5 regarding the documentation of inventory level fieldwork in general and is acceptable.

Regardless of the absence of culturally or historically significant properties within the bounds of the project area, we agree that precautionary archaeological monitoring is warranted during future ground altering disturbance in the portion of the project area not subject to subsurface testing. Please note that this recommendation will require the submission of an appropriately prepared *monitoring plan* to this office for review and acceptance prior to such work commencing.

Now that the archaeological inventory report has been accepted pursuant to HAR §13-276, please send one hardcopy, clearly marked **FINAL** *(the revised electronic copy does not need to be sent again)* to the attention of "**SHPD Library**" at the Kapolei SHPD office.

Aloha,

Nancy A. McMahon

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

c: Jeff Hunt, Director, Dept. of Planning, FAX (808) 270-7634
Maui CRC, Dept. of Planning, 250 S. High Street, Wailuku, Hawai'i 96793

APPENDIX D.

Cultural Impact Assessment

'A'apueo I Ka La'i

('A'apueo in Tranquility)

FINAL REPORT

Pulelehuakea Residential Subdivision and Related Improvements at TMK (2)2-3-008:03 'A'apueo, Pukalani, Maui Hawaii

Owned by:

KG MAUI DEVELOPMENT LLC, 1288Alamoana Blvd. Suite 201, Honolulu Hawaii, 96814

Pueo (Hawaiian Owl)

Asio flammeus sandwicensis

Prepared for:

Munekiyo & Hiraga, Inc., 305 High St. Suite 104, Wailuku, HI. 96793

Prepared by:

CKM Cultural Resources LLC, 157 Alea Place, Pukalani Maui, 96768, (808) 573803

'A'apueo I Ka La'i

('A'apueo in Tranquility)

Prepared for:

Munekiyo & Hiraga, Inc., 305 High St. Suite 104, Wailuku, HI. 96793

Prepared by:

CKM Cultural Resources LLC, 157 Alea Place, Pukalani Maui, 96768, (808) 573803

INTRODUCTION

MAY 27,2010

INTRODUCTION – *EIA KA LĀ HIKI*

Scope:

The scope of this report will be to compile various historical, cultural, and topographical accounts and facts of 'A'apueo and its adjacent *ahupua'a*.[1] With only a few exceptions, direct references to 'A'apueo are meager. Therefore, the following description of the project area is derived from topographical, cultural, and usage descriptions of the more general areas of Kula. The report will be;

(1) In accordance with O.E.Q.C. guidelines, the study will describe resources having cultural value, and will describe potential impacts from further development along with measures that could be employed to mitigate those impacts. The contractor will coordinate with the archeologist characterizing the site to evaluate the cultural significance of historic and prehistoric resources identified during an archeological

[1] 'Ahupua'a: Land divisions. Much of the information of this compilation will also derive from the adjacent land divisions due to the lack of written and contextual information based on various written and noted sources.

inventory, and will assist in the development of a general preservation plan for those resources.

(2) It will also include a Traditional Practices Assessment that will meet the assessment requirements of O.E.Q.C. and O.H.A. for cultural impacts. Specifically, the document will address potential effects on Hawai'i's culture, and traditional and customary rights, as described in the legislation known as Act 50, 2000.

Specific Area of Research:

This project site shall be identified as TMK (2)2-3-008:036. The property is located between Holes 5, 6, and 7 of the Pukalani, Country Club Golf Course It will be a 23 lot subdivision. This said lot resides in the ahupua'a of Kula and in the *'ili*[2] of 'A'apueo.

'A'apueo: 'A'apueo is a unique 'ili, and has a distinct topographical position. 'A'apueo is nestled on ridges, which would have made this area a safe area to live.

A kahuna once lived in 'A'apueo, and his sole responsibility was to protect a heiau that was built on Pu'upane hill, in the Kula ahupua'a. While Kihapi'ilani and his wife stayed at 'A'apueo, they came in contact with this kahuna, who then gave the King and Queen a tour of the ahupua'a.

Many surrounding 'ili within Kula are either adjacent or perpendicular to the said property.

Surrounding 'Ili within Kula:

There are many 'ili within the ahupua'a of Kula which stretch from the shoreline to the peak of the mountain. 'A'apueo is located on a high elevated plain of this ahupua'a. This 'ili is surrounded by other 'ili, such as Maka'eha (separated by Kalialinui gulch), Ōma'opio, Keahua, Kailua, and many other *'ili'ili*[3].

Maka'eha: (Lit. sore eyes) Maka'eha is rich with heritage. Much of the upper plains of the Kula region were dry and arid. This had left only a few options for the types of plants that could be cultivated here, and it was the home to one of the best plants that could handle such arid conditions. This area was the home to King Kihapi'ilani's mala 'uala (Sweet Potato Garden). Maka'eha is now called "Pukalani". It takes its name from a hill in the Makulekailua[4] area, which is called "Pu'ukalani (lit. meaning; "Hill to heaven").

---

[2] 'Ili: Land section within a specific land division.
[3] 'Ili'ili: Smaller Land Sections within a specific land division and land section.
[4] Makulekailua(old Kailua), located below what is now Pukalani, above Keahua.

Pu'upane: (Lit. hill of answers) Pu'upane resides within the district of Kula. This hill was decreed by a ruling chief of Maui to be sacred. No commoner ascended this hill, for it was a heiau[5] for the high chiefs of Maui, stretching from ancient times until Kihapi'ilani's arrival upon the hill of Pu'upane. A certain *kahuna*[6] lived at 'A'apueo to make certain that no commoner ascended Pu'upane, and allowed only those who were sanctified to do so.

Ōma'opio: (Lit. whistling thrush) Ōma'opio has four registered heiau and numerous ahu[7]. Located at Ōma'opio is a heiau named Mo'omuku[8]. This extensive heiau measured some ninety feet by one hundred and eight feet. Another registered heiau is Mahia heiau, located more to the north than Mo'omuku. This heiau is also smaller than Mo'omuku, at thirty-two feet by forty-one feet. Po'ohinahale heiau is located on the opposite side of Mahia heiau. This may also be the same heiau that is called Kaunuopahu, however the only living informant gave the name Po'ohinahale.

[5] Heiau: Sacred place of worship of various gods.
[6] Kahuna: Spiritual Priest. (Lit. keeper of the secret)
[7] Ahu: Personal platforms of which commoners and royalty alike created to heed offerings to various gods and guardians.
[8] When translated Mo'omuku means "dissected lizard."

'A'apueo: The female deity:

The completion of this report cannot be achieved without the mention of 'A'apueo. In various translations, the term 'A'apueo could mean "the owl's wail." The place name could also reflect the topography of the area, which is encompassed by the 'a'a rock. However, most sources believe the place was named after a female deity. A female by the name of 'A'apueo once resided in this area, and 'til this day the area bears the name 'A'apueo.

Lifestyle:

The word Kula in Hawaiian translates to plain. While this may barely describe some of the topographical features of this ahupua'a, much of its landscape is dry and arid. Therefore, farming was limited to plants that were tolerable to cold evenings and hot tempered days. Although the landscape of Kula has changed considerably over the past two to three hundred years, the climate has remained constant. The scene for most of the landscape was farming families.

It was often documented that the people of Kula were incompetent. This was due to the fact that the people of Kula were not accustomed to the ways of the ocean. Families that lived near the ocean, and those who frequented the shores, mocked the people of Kula who lacked experience in the ocean lifestyle. Therefore, those who lacked the experience needed to master the familiarities of the ocean were deemed incompetent.

Today, Kula is a rapidly changing community, being very different from its scene ten years ago. The area is still largely agriculturally zoned. However, the demand for the suburban lifestyle shows its price, at nearly one million dollars for a choice lot. Its hillsides are abundant with wild deer that were introduced within the last 3 decades, and which is the cause of mass erosion and crop damage to the surrounding areas and farms of Kula.

Many of the culturally significant sights, such as heiau and ahu, are no longer existent due primarily to the "paniolo" age[9]. During this era, much of the land was cleared for the industrially driven use of cattle ranching. Heiau and ahu were plundered without regard for its significance to the area. As mentioned earlier, the ahupua'a of Kula had many heiau and ahu located in 'ili such as Ōma'opio. During the late 1950's and 1960's, the conceptualized "suburbia" became the dream place to live, and thus begin the influx of homes and population in Kula. This left little recovery of what had already been destroyed by the paniolo era. Fifty years ago, a Cultural Impact Statement was not an issue, and neither was the significance of documenting Hawaiian antiquities. This is the reason for the lack of information of such items.

[9] Paniolo Age: The era of cowboy influx in the Kula region.

Native Plant Growth:

The vegetation in the Kula and 'A'apueo area do not flourish as generously as various other ahupua'a on Maui.

Every aspect of the traditional lifestyle was closely interconnected with the life forms of these islands. The saying, "He Hawai'i Au" – I am Hawai'i – reveals this basic truth: the people and their environment are one. All of the needs of the population (which numbered nearly as many as those who inhabit Hawai'i today) were provided for abundantly from the life of the land and ocean, created by the stored energy of the sun, and materializing in multitudes of useful and beautiful forms.

Due to the geographic location, as the most isolated land in the world (5,000 miles from the nearest continent), the Hawaiian archipelago evolved incredibly diverse and unique ecosystems, with myriad species of flora and fauna found nowhere else on the planet.

A well-known tree is the sandalwood (Santalum freyecinetianum), known in Hawaiian as 'Iliahi. The wood was traditionally used to scent kapa cloth. It was sometimes used to make 'ukeke (a musical bow), the only traditional Hawaiian stringed instrument. The leaves and wood of sandalwood trees were also used medicinally, often in combination with 'awa and other woods. One type of sandalwood, of the lanaiense variety, occurs near the peak of Kula's boundaries. With a red flower, it is found only on East Maui and Lāna'i, and is an endangered species. Only around 100 plants survive today, with a population found on the south slope of Kula.

Other medicinal plants from this area include the 'Ahina Kuahiwi (Gunnera petaloidea), also known as the Ka'ape'ape or 'Ape'ape, and the Mau'u La'ili (sisyrinchium acre), a crawling grass (native iris) found on Kula's highest point. The Mau'u La'ili is used to treat skin disorders.

The durable wood of the golden-flowered lacy Mamane or Kolomona tree (sophora chrysophylla) was utilized to make o'o (digging sticks), house poles, and hōlua sleds.

Most of Kula's landscape is in a fairly dry and arid state, and thus, most plants do not do well in places like these. However, Kula provided a well-balanced dirt, as known today for producing the famous "Maui Onion."

Due to the dry conditions, kalo or taro was not a suitable crop to plant. To supplement the need of wet land kalo, the 'uala (sweet potato) was grown as an alternative. Many sources point to the example of Kihapi'ilani's potato patch in Maka'eha. Sweet potato was just as stable and healthy as kalo, yet required less water to fruit, whereas the kalo grew best in fields of fresh running water.

Another plant that may have grown in this area, to supplement the need of kalo, is 'ulu (artocarpus incisus) or breadfruit. According to "Native Planters in Old Hawai'i: Their life, lore, and environment," written by E.S. Handy et al. explicates, "...early voyagers noted extensive planting of breadfruit along the southern and leeward coast..." Although this statement singles out the Southern and leeward coasts, which are the dryer areas of the island, Kula still made a perfect place for 'ulu to flourish because of its arid plains.

Another blossoming plant that has resided in this area is the 'a'ali'i (dodonaea viscosa) bush. This hard wood native shrub is indigenous to the islands. This plant also grows well in dryer climates. Ranging in heights of one to thirty feet, this shrub/tree is found growing at elevations of up to 8,000 feet, and in wind-swept open country. It is found today in the gulches and surrounding area of this site.

One essential plant used to construct thatched homes was the Pili grass (heterogon contortus). This grass was also quite common in these areas because of the climate conditions. Pili liked to grow in arid and dusty conditions. The Hawaiian people would bunch dried clumps of grass together to create a waterproofed house.

Wildlife:

There is little recorded information about the wildlife in the Kula/'A'apueo region. However, today the area is infested with foreign plants, wild feral, and fowl. This has left much of Kula's natural habitat destroyed.

In 'A'apueo's own region, seldom does the native owl take flight. It is the common barn owl, native to North America, which primarily inhabits the region. The common barn owls tend to be more aggressive in nature, which has caused depletion in other native birds and native plant species.

Informant's interviews

CKM CULTURAL RESOURCES

Specializing in Cultural Impact Statements
(using State of Hawaii O.E.Q.C. methods),
Blessings, Weddings, Lectures
and Ho'oponopono

IMINA I KA NA'AUAO E PAIU IA MAKOU I MUA
(Seeking the knowledge to push us forward)

INTERVIEW FORM

NAME – PRINTED: EARL N LAMADORA

SIGNATURE: Earl M Lamadora

ADDRESS: 3530 HALEAKALA HWY
PUKALANI, HI 96768

TELEPHONE: 572-7341 572-7261

PLACE OF INTERVIEW: 157 Alea Place, Pukalani

DATE & TIME OF INTERVIEW: 3/5/03 – 9:10 AM

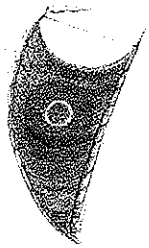
INTERVIEWER: Charles K. Maxwell Sr.

I understand that my statement will be used in a public document and it is my understanding that before it is published, I will have a chance to see it and make corrections if needed. **INITIAL:** EAL

INTERVIEWERS SIGNATURE:

DATE & TIME: 3/5/03 – 10:30 AM

Kahu Charles Kauluwehi Maxwell, Sr.
157 Alea Place · Pukalani, Maui, HI 96768
Phone: (808) 572-8038 · Fax: (808) 572-0602 · Cell: 870-3345
Email: kale@moolelo.com · Website: www.moolelo.com



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IMINA I KA NA'AUAO E PAHU IA MAKOU IMUA
(Seeking the knowledge to push us forward)

INTERVIEW FORM

NAME – PRINTED: FRANCES K. LAMADORA

SIGNITURE: Frances K Lamadora

ADDRESS: 3550 HALEAKALA HWY
PUKALANI, HI 96768

TELEPHONE: 572-7341

PLACE OF INTERVIEW: 157 Alea Pl. Pukalani

DATE & TIME OF INTERVIEW: 3/5/03 – 9:10 Am

INTERVIEWER: Charles K. Maxwell Sr.

I understand that my statement will be used in a public document and it is my understanding that before it is published, I will have a chance to see it and make corrections if needed. **INITIAL:** KL

INTERVIEWERS SIGNITURE:

DATE & TIME: 3/5/03 – 10:30 Am.

Kahu Charles Kauluwehi Maxwell, Sr.
157 Alea Place · Pukalani, Maui, HI 96768
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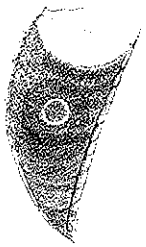

IMINA I KA NA'AUAO E PAIHU IA MAKOU IMUA
(Seeking the knowledge to push us forward)

CKM CULTURAL RESOURCES

CKMculturalresources
157 Alea Place, Pukalani, Maui 09768
Phone: (808)572-8038 – Cell -870-3345

Specializing in Cultural Impact Statements (using State of Hawaii O.E.Q.C. methods), Blessings, Weddings, Lectures and Ho'oponopono

INTERVIEW FORM

NAME – PRINTED: Hōkūlani Holt-Padilla

SIGNATURE: Hōkūlani Holt-Padilla

ADDRESS: 659 Pohala St., Wailuku 96793

TELEPHONE: 244-9569

PLACE OF INTERVIEW: Maui Arts & Cultural

DATE & TIME OF INTERVIEW: 3/10/03 11:50 am.

INTERVIEWER: Charles K. Maxwell Sr.

I understand that my statement will be used in a public document and it is my understanding that before it is published, I will have a chance to see it and make corrections if needed. INITIAL: HHP

INTERVIEWERS SIGNATURE:

DATE & TIME: 3/10/03

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'A'apueo I Ka La'i

('A'apueo in Tranquility)

INFORMANTS INTERVIEWS

DATE, TIME & PLACE OF INTERVIEW
March 5th 2003 at 9:00am., interviewed at 157 Alea Place, Pukalani, Maui, HI.

Mrs. Frances Lani Kalani Lamadora
Born 1927 Hali'imaile, Maui
Housewife
3550 Haleakalā Hwy., Pukalani, Maui, HI. 96768

Interviewed at my home. She stated that she was born in Hali'imaile, and when she was a teenager, her family moved to Pukalani. Her home is across the gulch (Makawao area) of the project site. She related that when she was growing up in the area, they used to walk through the gulches, and through the project area. They used to see all kinds of "Hawaiian things" in the gulch, but always remembered what her parents taught them. They were not to touch things, or to be "niele" (curious) when they saw anything that belonged to the ancient culture of Hawai'i.

She recalls that her "Tutu" (grandparent) used to tell her that the real name for the area that they lived in was Maka'eha. Her grandmother used to scold her because they tried to shoot the owls that flew in the area with a slingshot. Her grandmother told her the owl was their Aūmakua (family god), so she should not harm the owl.

She remembers that there was a Heiau (Hawaiian temple) above her home, but she was always told by her parents to stay away from the "stone pile". She does not remember anything about the area being studied, except for the high grass that was growing in the area of the project.

March 5th 2003 at 9:15 am., interviewed at 157 Alea Place, Pukalani, Maui, HI.

Earl N. Lamadora, 30 years old.
Baker – Komoda's Bakery
3550 Haleakala Hwy., Pukalani, Maui, HI. 96768

Interviewed at my home. He stated that he did not know much about the area around his home, and he was always told by his mother not to disturb anything that

belonged to the Hawaiian people. He was born in the house that they are living in now. He had nothing further to add. At no time did he see or hear of any cultural gathering in the project site.

March 10th, 2003 at 11:00am., interviewed at the Maui Arts and Cultural Center

Hōkūlani Holt-Padilla
Cultural Specialist- Maui Arts & Cultural Center
659 Pahala St., Wailuku, Maui, HI. 96793

Interviewed at her office. Related that she is aware of the project area, and is familiar with the past cultural history of the area. She did not know of any archaeological sites within the study area. However, she is aware of the gulches and ancient Heiau in other areas surrounding the project site.

Note: **"Mr. Tadaki of Munekiyo & Hiraga, Inc. initially interviewed me for this report, then the cultural assessment was turned over to CKM Cultural Resources, with Kahu Charles K. Maxwell Sr., writing this report. Because this interview is important for this report, it is submitted with Mr. Tadaki as the interviewer." Certain corrections were made using the Hawaiian Font to the original draft**

Interview with: **Kahu Charles Kauluwehi Maxwell Sr.**

Interviewed by: **Glenn Tadaki, Planner**
Munekiyo & Hiraga, Inc.

Date: January 29, 2003 at 11:00am., interviewed at office of Munekiyo & Hiraga, Inc., 305 High St. Suite 104, Wailuku, HI. 96793

Kahu (Reverend) Charles Kauluwehi Maxwell Sr. is an ordained Hawaiian priest and a spiritual healer, as well as a well-known cultural practitioner, teacher, lecturer, and resource consultant. He is also an author, songwriter, and host of his own local radio and television shows, as well as the manager of the Pukalani Hula Hale and the executive director of Hui 'Ai Pōhaku Inc., a non-profit organization for the preservation of Hawaiian Culture and Spirituality. In addition, Charles presently serves as the Chair of the Maui/Lanai Island Burial Council, and the Maui member/past chair of the Hawai'i Advisory Committee to the U.S. Civil Rights Commission, and a Hawaiian member of the State Shark Task Force. He is also the Hawaiian Cultural Advisory to the Maui Ocean Center.

Charles was born in Lahaina, Maui, in 1937. Three years later, Charles and his family moved to Kula, where he grew up and was raised. From birth until kindergarten, Charles spoke only Hawaiian, because that was the only language his parents spoke at home. Through public schooling, Charles learned the English language.

As the youngest family member, Charles' parents taught him much about Hawaiian cultural practices, including religious ceremonies for reinterring ancient Hawaiian remains. From the age of 19, Charles handled the reinterment of inadvertently discovered ancient remains.

As a teen, Charles would go into Haleakala Crater to hunt and camp. During one of his trips, he discovered a cave containing an akua ka'ai (sacred image). The information he gained broadened his understanding of the Hawaiian Culture. This experience, and many others after that, have led to his becoming a member of the State Cave Task Force, which advances the knowledge of burial caves and protects their sacredness for the Hawaiian people.

For 15 years, Charles served as an officer with the Maui Police Department, with 5 of those years being on the island of Molokai. In 1974, Charles retired due to injuries sustained in the line of duty.

After being injured, Charles did a lot of research on all phases of the Hawaiian culture, including oral history interviews with Kūpuna (elders). He also became very active in community affairs associated with native Hawaiian rights and culture. For example, Charles served as the first president of the A.L.O.H.A. (Aboriginal Lands of Hawaiian Ancestry) Association and journeyed to Washington D.C. to seek reparations from the federal government for the overthrow of the Hawaiian Monarchy. In 1976, Charles organized and led the first native Hawaiian occupation of Kaho'olawe, to protest the use of the island as a bombing range by the U.S. Navy. Charles was also instrumental in establishing guidelines for subsistence practices for the island, based on ancient Hawaiian methods of fishing. In 1991, when a tiger shark fatally attacked a woman swimming at Olowalu, Charles spearheaded efforts to successfully halt a shark eradication program, on the basis that the shark was the "Aūmakua" (personal god) to some of the Hawaiian families. Charles currently serves as the Hawaiian advisor to the State Shark Task Force. In 1997, Charles spearheaded a drive to stop the selling of t-shirts and other trinkets in Iao Valley. Later, he lobbied the legislator to create laws to put a halt on all sales in State Parks. This law is now in existence.

In regards to the project area, Charles believed that 'A'pueo Parkway was named after the female owl-goddess who lived in the area. Charles wrote a chant about 'A'apueo, which was performed during the annual Merrie Monarch Festivals in Hilo.

In pre-contact times, Charles mentioned that lands in the project area served as the site for the observance of the Makahiki, an annual event held during the months of

January and February. During this time, taxes were collected and festivities held. Charles also mentioned that gulches in the area once contained adze factories, and evidence suggests that streams flowed within these gulches at one time.

During post-contact times, Charles indicated that the land, Mauka of the project site (across Kula Highway), was known for having the best sweet potato patches on the island. The sweet potatoes were planted to supply prospectors with food during the

California gold rush. Later, with the advent of cattle ranching, Charles mentioned that the indigenous plants and trees in the area were wiped out, and the forest line was moved further up the slopes of Haleakalā. Without the forests to capture rain clouds and facilitate precipitation, the flowing streams in the gulches ceased to be.

In terms of cultural resources, Charles indicated that he was not aware of, nor had observed, any cultural practices, gathering, or subsistence practices occurring on the land within the project area. In light of the foregoing, the proposed project is not expected to have any adverse impact on native Hawaiian cultural resources, practices and beliefs.

Topographic maps and overview of project area

Conclusion:

Much of 'A'apueo's history lacks in quantitative measures; therefore it is extremely difficult to extract the details of a lifestyle unfamiliar to those of today. The natural habitat is inundated with foreign forest shrubbery and various other plants brought in to "beautify" certain landscapes. An abundance of cactus plants can be seen thriving in the landscape.

The two gulches that sit on either side of the ridge largely protect 'A'apueo. History tells us that this feature was the reason 'A'apueo was a place of great refuge and home to many kahuna who guarded a special heiau with reverence.

Much of Kula's natural and indigenous landscape barely exists. The thinking then, should be to reverse the impact on the land, such as planting shrubs native to the area, desecrate the land as little as possible, and to stop the use of tactics such as those of the "paniolo era". More cautious approaches to certain areas are solutions to the vitality of our Hawai'i.

From all indication, this project will not affect the fauna, flora or endangered species, because it was already impacted by prior agricultural disturbances which occurred on this project area many years ago.

Because of the prior disturbance, no cultural or archeological properties were found for preservation on this project site. In the 6.0 acre project area, no evidence of past or present use for Hawaiian cultural practices, resources, or beliefs were found in the study area.

That does not mean that this area is free of Hawaiian cultural association. The property is surrounded by gulches (Kalialinui and Kaluapulani) on both sides, which happen to contain the best petroglyphs in the State Of Hawai'i. Members of the Polynesian Voyaging Society took rubbings from petroglyphs of a canoe, and used it to fashion the sail for the Hōkule'a (a Hawaiian double-hulled sailing canoe).

An archeological survey was completed of this area in 1996, by McPhater and Rosendahl of PHRI, and no sites were found on this property.

There are no areas of impact from the proposed construction on this site, so mitigation measures are not necessary. This study area does not pose an impact on access rights by Native Hawaiians that would require the use of this area for cultural and spiritual purposes.

'A'apueo I Ka La'i

('A'apueo in Tranquility)

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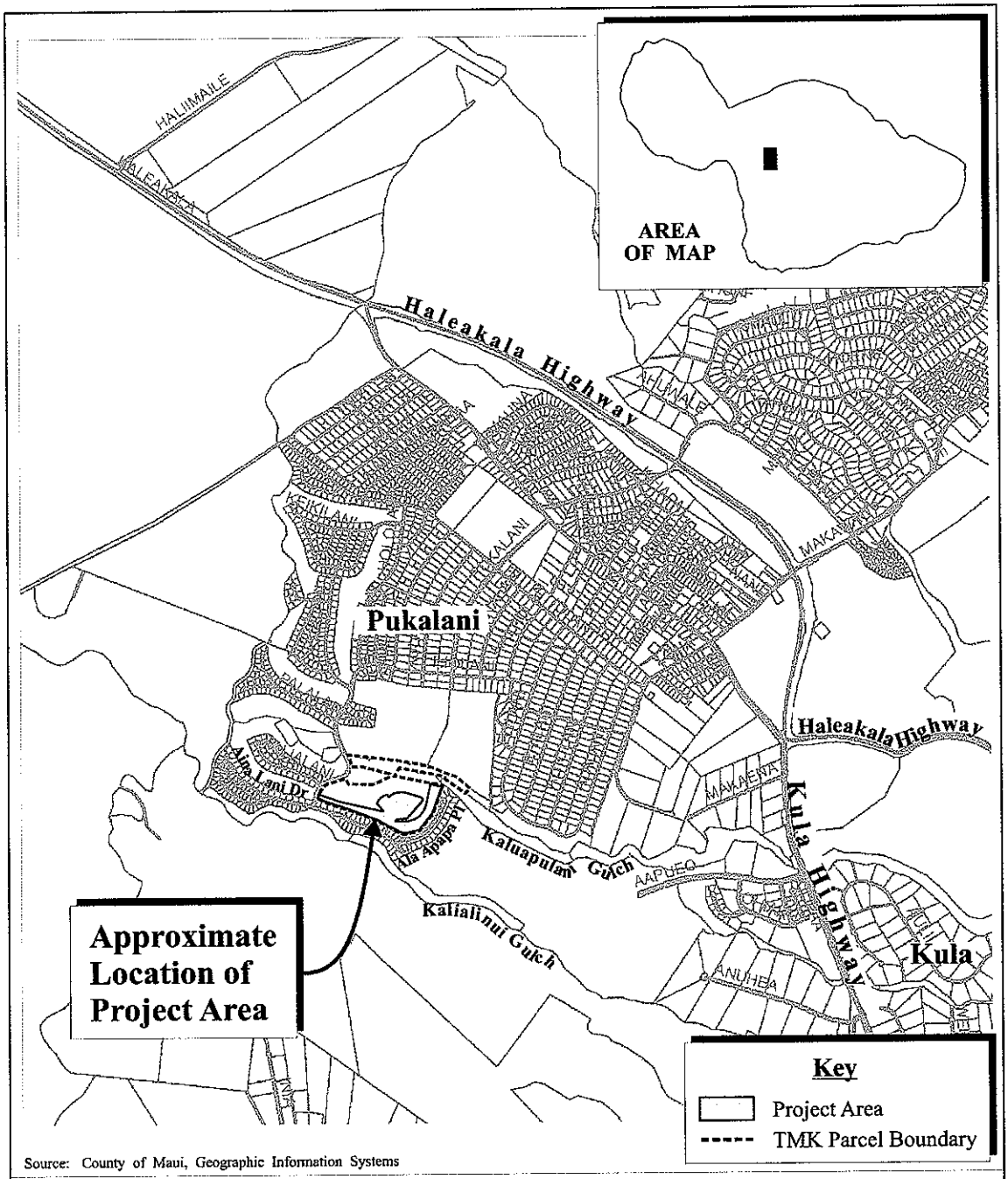
Regional location Map



Source: County of Maui, Geographic Information Systems

Proposed Pulelehuakea Residential Subdivision

NOT TO SCALE

Regional Location Map

Prepared for: KG Maui Development, LLC

MUNEKIYO & HIRAGA, INC.

KG Holdings\Pukalani3G\regionalDEA

APPENDIX E.

Traffic Impact Assessment Report

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email:prowell@hawiiantel.net

April 28, 2010

Leilani Pulmano
Munekiyo & Hiraga, Inc.
305 Hugh Street, Suite 104
Wailuku, Maui, HI 96793

Re: Traffic Impact Assessment Report
Pukalani Parcel 36
TMK: 2-3-008:036

Dear Leilani:

Phillip Rowell and Associates have completed the following Traffic Impact Assessment Report (TIAR) for a proposed single-family development. The following report is presented in the following format:

A. Project Location and Description
B. Purpose and Objective of Study
C. Methodology
D. Description of Existing Streets and Intersection Controls
E. Existing Peak Hour Traffic Volumes
F. Level-of-Service Concept
G. Existing Levels-of-Service
H. Project Trip Generation
I. Background Plus Project Traffic Projections
J. Impact Analysis of Background Plus Project Conditions
K. Mitigation
L. Summary and Conclusions

A. Project Location and Description

The proposed project is located along the north side of Aina Lani Drive and east of Liholani Street. The parcel is within the boundary of the Pukalani Country Club.

Access to and egress from the project will be via an existing intersection along the north side of Aina Lani Drive. The project will consist of 13 single-family residential units.

The location map and site plan provided by the Client is provided as Attachment A.

The site is currently vacant.

All traffic will access and egress the project site via the intersection of Aina Lani Drive at Liholani Street. This is the nearest intersection to the proposed project driveway and is the focal point of project generated traffic and background traffic generated by the residential development immediately adjacent to the project.

B. Purpose and Objective of Study

1. Quantify and describe the traffic related characteristics of the proposed project.

2. Identify potential deficiencies adjacent to the project that will impact traffic operations in the vicinity of the proposed project.

C. Methodology

1. *Define the Study Area*

The first step in defining the study area was to estimate the number of peak hour trips that the proposed project will generate. It was estimated that the project will generate ten (10) trips during the morning peak hour and thirteen (13) trips during the afternoon peak hour. This implies that the scope of the traffic assessment should be limited to an "access location and design review" analysis as described by the Institute of Transportation Engineers[1]. Accordingly, the traffic impact assessment is limited to the intersections of the Aina Lani Drive at Liholani Street and Aina Lani Drive at the project driveway.

2. *Analyze Existing Traffic Conditions*

Existing traffic volumes at the intersection of Aina Lani Drive at Liholani Street were estimated from manual traffic counts performed during the morning and afternoon peak periods by the Consultant. These counts were conducted on Thursday, April 1, 2010. Traffic at the intersection of Aina Lani Drive at the project driveway were estimated from the counts.

3. *Estimate Horizon Year Background Traffic Projections*

Background traffic conditions are defined as future traffic conditions without the proposed project. The design horizon year does not necessarily represent the project completion date of that phase. It is a date for which future background traffic projections were estimated. For this project, we have used a design, or horizon, year of 2012. It is estimated that background growth between 2009 and 2012 will be negligible as the surrounding area is fully developed and there is no through traffic along Aina Lani Drive or Liholani Street that would increase as a result of regional traffic growth. Accordingly, it was assumed that 2012 background traffic volumes will be comparable to 2010 traffic volumes.

4. *Estimate Project-Related Traffic Characteristics*

The number peak-hour trips that the proposed project will generate was estimated using standard trip generation procedures described in the *Trip Generation Handbook*[2] and data provided in *Trip Generation*[3]. These are the standard references used for trip generation studies in Hawaii.

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[1] Institute of Transportation Engineers, Transportation and Land Development, Washington, D.C., page 3-6

[2] *Trip Generation Handbook*, Institute of Transportation Engineers, Washington, D.C., 1998

[3] *Trip Generation*, Institute of Transportation Engineers, Washington, D.C., 2003

5. *Analyze Project Related Traffic Impacts*

The project-related traffic was then superimposed on background traffic volumes. The traffic impacts of the project were assessed by analyzing the levels-of-service. The purpose of this analysis was to identify potential operational deficiencies at the project driveway.

D. Description of Existing Streets and Intersection Controls

Aina Lani Drive is a two-lane, two-way private street with an east-west orientation. Adjacent development along both sides is single-family residential and there is are bike lanes along both sides of the street east of Liholani Street. There are curbs, gutters and sidewalks along both sides of the street. The posted speed limit is 20 miles per hour.

Liholani Street is also a two-lane, two-way County roadway connecting Aina Lani Drive with Pukalani Street and which connects to Old Haleakala Highway. There are curbs and gutters along both sides of the street. There is a sidewalk along the west side of the street only. The posted speed limit is 20 miles per hour.

The intersection of Aina Lani Drive at Liholani Street is a STOP sign controlled T-intersection. There are no separate turn lanes along the approaches. A schematic drawing of this intersection is provided as Attachment B.

Sight distances appear to be acceptable but should be confirmed by the project's civil engineer.

E. Existing Peak Hour Traffic Volumes

Existing peak hour traffic volumes were estimated from manual traffic counts and are also summarized on Attachment B.

1. No buses, trucks and other large vehicles were observed during the traffic counts.

2. No mopeds or bicycles were observed during the counts.

3. No pedestrian activity was noted.

The traffic count summary worksheets are provided as Attachment C.

F. Level-of-Service Concept

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 1. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. *Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.*[4]

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 1 Level-of-Service Definitions for Signalized Intersections(1)

Level of Service	Interpretation	Volume-to-Capacity Ratio(2)	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 2 summarizes the definitions for level-of-service and the corresponding delay.

[4] Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development: A Recommended Practice*, 2006, page 60

Table 2 Level-of-Service Definitions for Unsignalized Intersections[1]

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

G. Existing Levels-of-Service

The results of the level-of-service analysis of existing conditions are summarized in Table 3. Shown are the average vehicle delays and levels-of-service of the controlled lane groups. The methodology for unsignalized intersections does not calculate delays and levels-of-service of uncontrolled lane groups as uncontrolled lane groups are free flowing and therefore have no delay. All controlled lane groups operate at Level-of-Service A, which is the highest level-of-service. This implies very good traffic operating conditions and minimal delays.

Table 3 Existing Levels-of-Service Analysis - Aina Lani Drive at Liholani Street

	AM Peak Hour		PM Peak Hour	
	7:00 am to 8:00 am		3:00 pm to 4:00 pm	
Approach and Movement	Delay	LOS	Delay	LOS
Eastbound Left & Thru	7.5	A	7.3	A
Southbound Left & Right	9.2	A	8.9	A

NOTES:
1. Delay is in seconds per vehicle.
2. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay.
3. See Attachment D for Level-of-Service Calculation Worksheets.

H. Project Trip Generation

Future traffic volumes generated by a project are typically estimated using the methodology described in the *Trip Generation Handbook*[5] and data provided in *Trip Generation*[6]. This method uses trip generation rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street

The proposed action is the construction of thirteen (13) single-family dwelling units. The trip generation rates are based on the number of dwelling units. The trip generation calculations are summarized in Table 4. As shown, the proposed project will generate 3 inbound and 7 outbound trips during the morning peak hour. During the afternoon peak hour, the project will generate 8 inbound and 5 outbound trips.

[5] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998, p. 7-12

[6] Institute of Transportation Engineers, *Trip Generation, 7th Edition,* Washington, D.C., 2003

Table 4 Trip Generation Calculations for Proposed Project

Time Period	Direction	Single-Family Detached Housing (LU Code 210)		
		Rate or %[1]	Occupied Units	Trips
AM Peak Hour	Total	0.77	13	10
	In	26%		3
	Out	74%		7
PM Peak Hour	Total	1.02		13
	In	64%		8
	Out	36%		5

NOTES:
(1) Institute of Transportation Engineers, *Trip Generation*, Seventh Edition, 2003.

As project generated traffic and existing traffic using the intersection of Aina Lani Drive at Liholani Street are both residential, it was assumed that traffic patterns of traffic generated by the proposed project will be comparable to the traffic patterns of traffic generated by the existing residential development along Aina Lani Drive east of Liholani Street. The approach and departure distribution and the resulting project trip assignments are shown in Attachment E.

I. Background Plus Project Projections

Background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the background (without project) peak hour traffic projections. This assumes that the peak hourly trips generated by the project coincide with the peak hour of the adjacent street. This represents a worse-case condition as it assumes that the peak hours of all the intersection approaches and the peak hour of the study project coincide. The traffic projection calculations are shown as Tables 5 and 6. The resulting background plus project peak hour traffic projections are shown in Attachment E.

Table 5 Traffic Projection Calculations
Aina Lani Drive at Liholani Street

Approach and Movement		Existing Background (2009)		Project Trips		Background Plus Project	
		AM	PM	AM	PM	AM	PM
North	Right	13	32			13	32
	Left	10	20	3	8	13	28
East	Right	39	17	7	5	46	22
	Thru	0	2			0	2
West	Thru	0	4			0	4
	Left	46	16			46	16
Totals		108	91	10	13	118	104

Table 6 Traffic Projection Calculations
Aina Lani Drive at Project Driveway

Approach and Movement		Existing Background (2009)		Project Trips		Background Plus Project	
		AM	PM	AM	PM	AM	PM
North	Right			7	5	7	5
	Left					0	0
East	Right					0	0
	Thru	25	12			25	12
West	Thru	7	15			7	15
	Left			3	8	3	8
Totals		32	27	10	13	42	40

J. Traffic Impact Analysis

Level-of-Service Analysis

1. The *Highway Capacity Software* (HCS) package was used to perform level-of-service analyses. This package uses the methodology described in the *Highway Capacity Manual.*

2. We have used the Institute of Transportation Engineers standard that a Level-of-Service D is the minimum acceptable level-of-service and that the criteria is applicable to the overall intersection. If project generated traffic causes the level-of-service to drop below Level-of-Service D, then mitigation should be provided to improve the level-of-service to Level-of-Service C or better. Minor movements, such a left turns and side street approaches may operate at Level-of-Service E for short periods. "Level-of-Service E is sometimes tolerated for minor movements such as left turns when there are no feasible mitigating measures or if it helps maintain the main through movements at acceptable levels-of-service."

3. As the *Highway Capacity Manual* defines level-of-service by delay, we have used the same definitions.

The results of the level-of-service analysis are summarized in Tables 7 and 8. Shown are the peak hourly traffic volumes and the average vehicle delays and the levels-of-service of the lane groups. The analysis concluded that all traffic movements will operate at Level-of-Service A, which implies good operating conditions and minimal delays.

Table 7 2012 Levels-of-Service Analysis - Aina Lani Drive at Liholani Street

	AM Peak Hour				PM Peak Hour			
	Without Project		With Project		Without Project		With Project	
Approach and Movement	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound Left & Thru	7.5	A	7.5	A	7.3	A	7.3	A
Southbound Left & Right	9.2	A	9.4	A	9.0	A	9.0	A

NOTES:
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the generator.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual.* LOS is based on delay.
4. See Attachment F for Level-of-Service Calculation Worksheets.

Table 8 2012 Levels-of-Service Analysis - Aina Lani Drive at Project Driveway

Approach and Movement	AM Peak Hour With Project		PM Peak Hour With Project	
Eastbound Left & Thru	7.3	A	7.2	A
Southbound Left & Right	8.5	A	8.4	A

NOTES:
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the generator.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay.
4. See Attachment F for Level-of-Service Calculation Worksheets.

J. Mitigation

Level-of-Service D is generally considered to be the minimum acceptable peak hour level-of-service for urban intersections.[7] As all controlled traffic movements will operate at Level-of-Service A, no mitigation is recommended.

L. Summary and Conclusions

The conclusions of the traffic impact assessment are:

1. The proposed project is located along the north side if Aina Lani Drive and east of Liholani Street. The parcel is within the boundary of the Pukalani Country Club. Access to and egress from the project will be via an existing intersection along the north side of Aina Lani Drive. The project will consist of thirteen (13) single-family residential units.

2. The proposed project will generate 3 inbound and 7 outbound trips during the morning peak hour. During the afternoon peak hour, the project will generate 8 inbound and 5 outbound trips.

3. The level-of-service analysis concluded that all controlled traffic movements will operate at Level-of-Service A, which implies good operating conditions and minimal delays. As all controlled traffic movements will operate at Level-of-Service A, no mitigation is recommended.

4. The project's civil engineer should confirm adequate sight distances at both study intersections.

Respectfully submitted,
PHILLIP ROWELL AND ASSOCIATES

Phillip J. Rowell, P.E.
Principal

[7] Institute of Traffic Engineers *Transportation Impact Analyses for Site Development, A Recommended Practice*, Washington, D.C., 2006, p 60.

List of Attachments

A. Project Location and Site Plan Provided By Client

B. Existing Conditions - Aina Lani Drive at Liholani Street

C. Traffic Count Summary Worksheets

D. Existing Levels-of-Service Worksheets

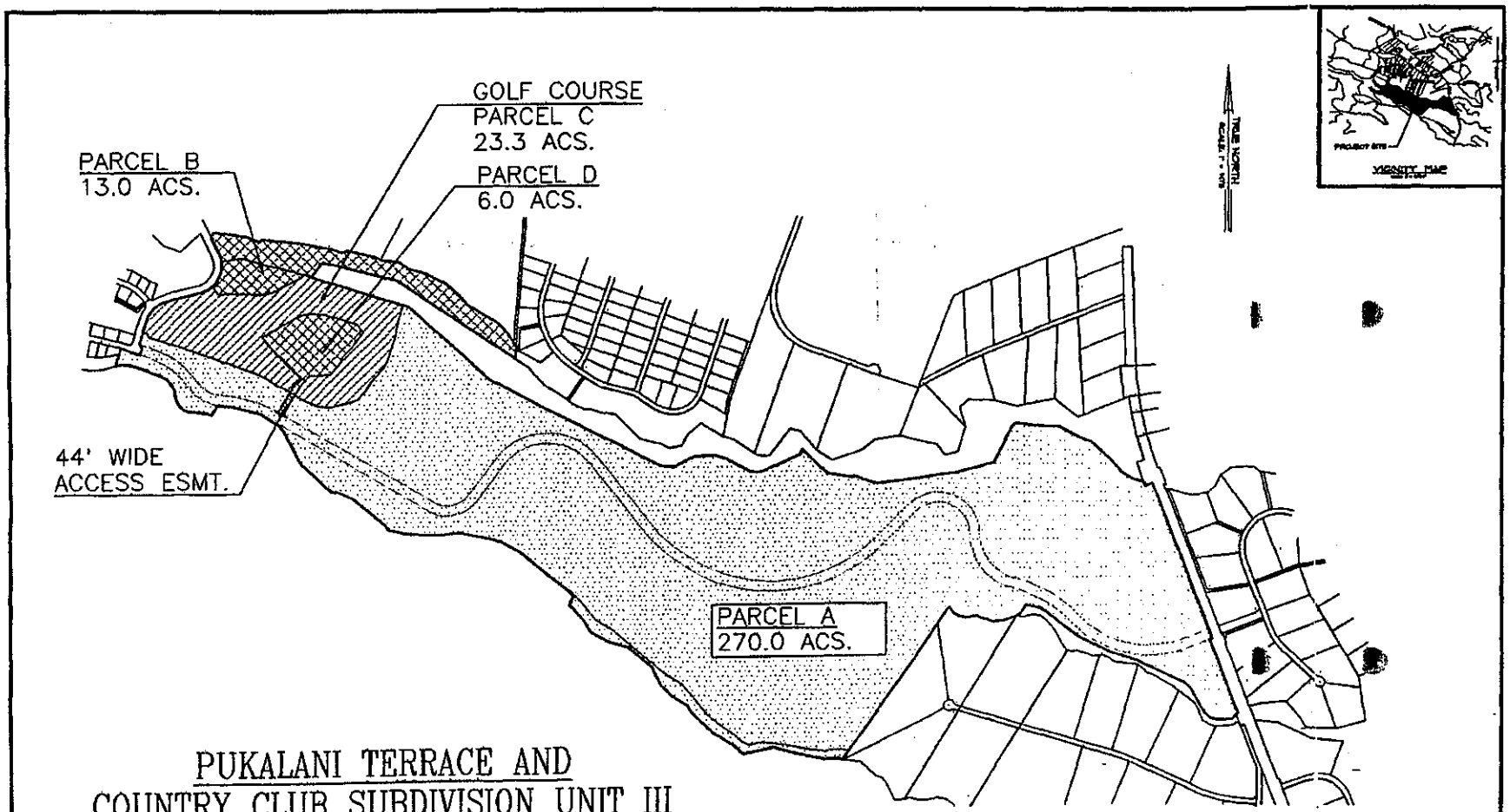
E. Project Trip Assignments and 2012 Background Plus Project Peak Hour Traffic Projections

F. 2012 Levels-of-Service Worksheets

Attachment A

PROJECT LOCATION AND SITE PLAN PROVIDED BY CLIENT

10-23-95



PUKALANI TERRACE AND COUNTRY CLUB SUBDIVISION UNIT III

NTS

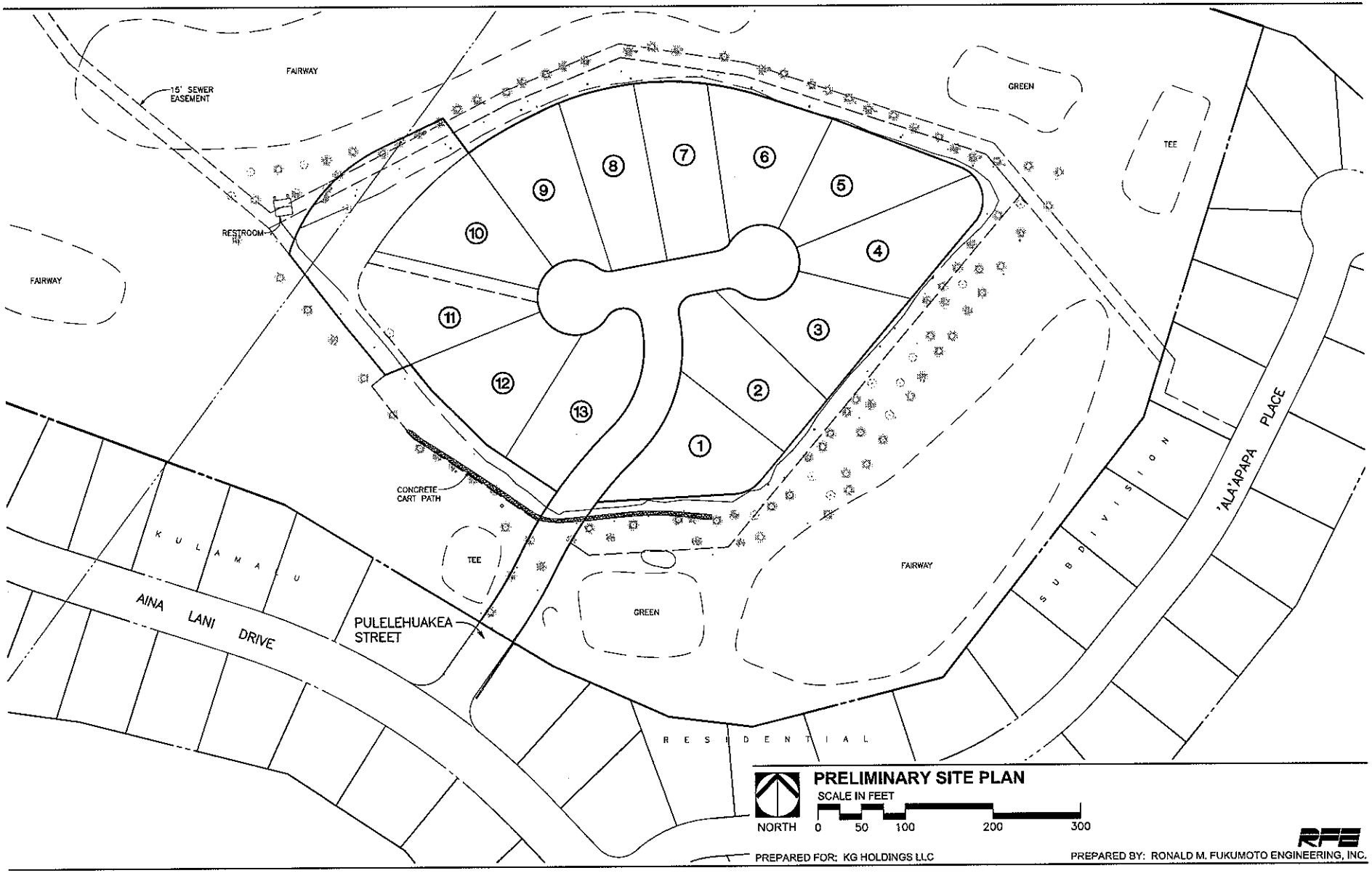
PREPARED FOR: SPORTS SHINKO (PUKALANI) CO., LTD.
AND
DOWLING COMPANY
P.O. BOX 1417
WAILUKU, HAWAII 96793
TEL.: (808) 244-1500
FAX: (808) 242-2777

EXHIBIT A

PUKA_EX.DWZ/RRF

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS
1871 WILI PA LOOP SUITE A • WAILUKU, MAUI, HAWAII 96793

A 09548


FAIRWAY
15' SEWER EASEMENT
RESTROOM
FAIRWAY
GREEN
TEE
10
9
8
7
6
5
4
11
3
12
13
2
1
CONCRETE CART PATH
TEE
FAIRWAY
GREEN
KULAMAU
AINA LANI DRIVE
PULELEHUAKEA STREET
SUBDIVISION
'ALA'APAPA PLACE
RESIDENTIAL
NORTH
PRELIMINARY SITE PLAN
SCALE IN FEET
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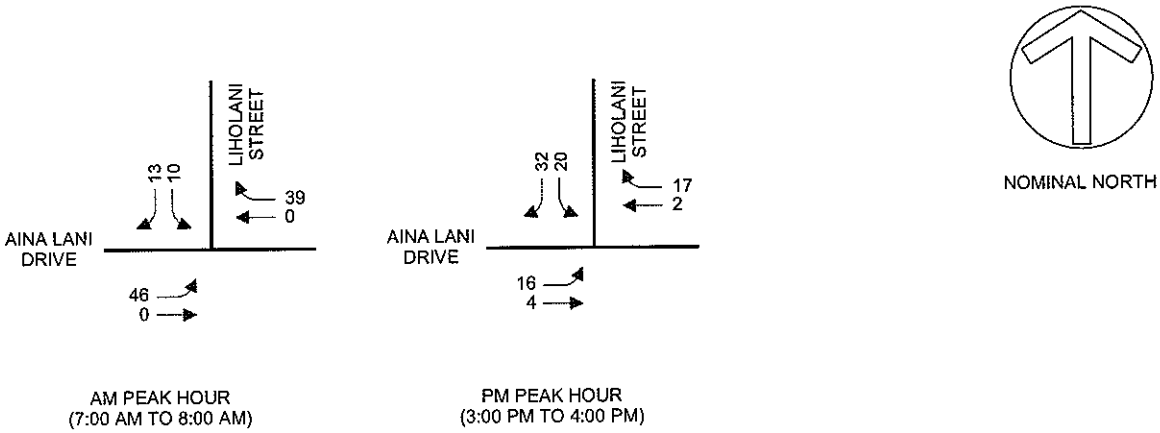
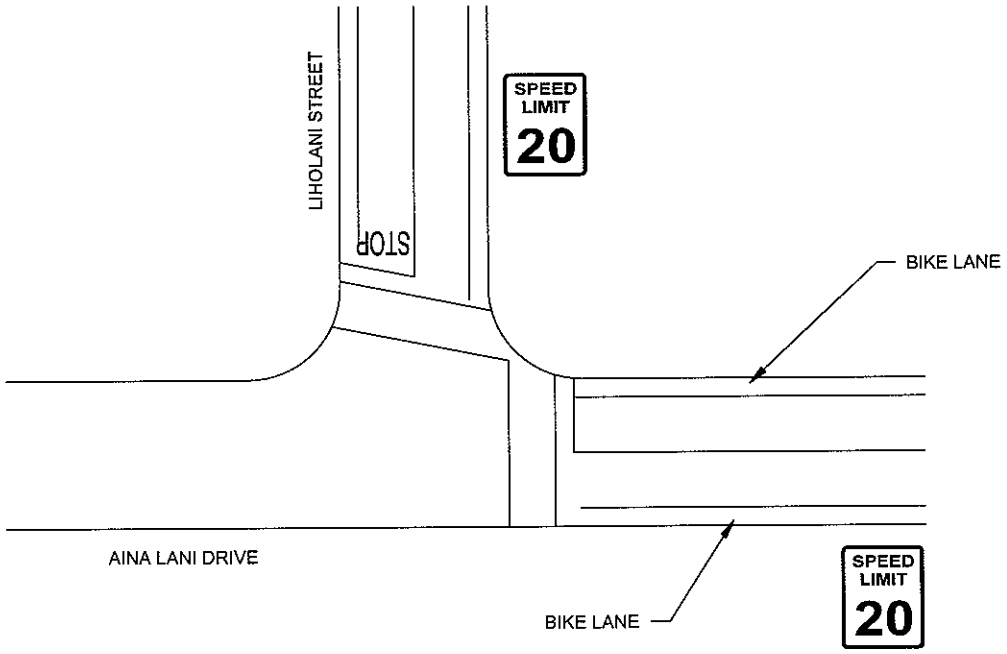
PREPARED FOR: KG HOLDINGS LLC
PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.



2010 PEAK HOUR TRAFFIC VOLUMES



Attachment B
EXISTING CONDITIONS
AINA LANI DRIVE AT LIHOLANI STREET

Attachment C

TRAFFIC COUNT SUMMARY WORKSHEETS

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Pukalani Parcel 36
INTERSECTION: Liholani Street at Aina Lani Drive
DAY & DATE: Thursday, April 1, 2010
START TIME: 6:30 am
END TIME: 8:30 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:30 am	2		0	8	0						0	12	22
2	6:45 am	4		0	5	0						0	10	19
3	7:00 am	1		1	10	0						0	12	24
4	7:15 am	5		1	7	0						0	16	29
5	7:30 am	0		2	16	0						0	7	25
6	7:45 am	7		6	6	0						0	11	30
7	8:00 am	0		5	3	0						0	4	12
8	8:15 am	3		0	5	0						0	8	16
9	8:30 am													0
10	8:45 am													0
11	9:00 am													0
12	9:15 am													0
13	9:30 am													0
14	9:45 am													0
	Maximum:	7		6	16	0						0	16	30

Hourly Volume of Each Movement

6:30 am	7:30 am	12	0	2	30	0	0	0	0	0	0	0	50	94
6:45 am	7:45 am	10	0	4	38	0	0	0	0	0	0	0	45	97
7:00 am	**8:00 am**	**13**	**0**	**10**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**46**	**108**
7:15 am	8:15 am	12	0	14	32	0	0	0	0	0	0	0	38	96
7:30 am	8:30 am	10	0	13	30	0	0	0	0	0	0	0	30	83
7:45 am	8:45 am													
8:00 am	9:00 am													
8:15 am	9:15 am													
8:30 am	9:30 am													
8:45 am	9:45 am													
9:00 am	10:00 am													
Peak Hour Volume		13	0	10	39	0	0	0	0	0	0	0	46	108
Peak Hour Factor:		0.46	0.00	0.42	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.90

Total Arrivals	23	39	0	46
Total Departures	85	10	0	13
Total	108	49	0	59

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Pukalani Parcel 36
INTERSECTION: Liholani Street at Aina Lani Drive
DAY & DATE: Thursday, April 1, 2010
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	10		6	6	1						3	3	29
2	3:15 pm	8		5	4	1						0	6	24
3	3:30 pm	10		5	4	0						1	3	23
4	3:45 pm	4		4	3	0						0	4	15
5	4:00 pm	8		5	3	0						0	5	21
6	4:15 pm	8		4	3	1						1	2	19
7	4:30 pm	12		8	4	0						1	5	30
8	4:45 pm	9		4	3	0						0	2	18
9	5:00 pm	8		6	2	0						0	1	17
10	5:15 pm	4		8	2	0						0	4	18
11	5:30 pm	11		4	3	0						0	4	22
12	5:45 pm	8		3	2	0						0	5	18
13	6:00 pm													0
14	6:15 pm													0
	Maximum:	12		8	6	1						3	6	30

Hourly Volume of Each Movement

3:00 pm	**4:00 pm**	**32**	**0**	**20**	**17**	**2**	**0**	**0**	**0**	**0**	**0**	**4**	**16**	**91**
3:15 pm	4:15 pm	30	0	19	14	1	0	0	0	0	0	1	18	83
3:30 pm	4:30 pm	30	0	18	13	1	0	0	0	0	0	2	14	78
3:45 pm	4:45 pm	32	0	21	13	1	0	0	0	0	0	2	16	85
4:00 pm	5:00 pm	37	0	21	13	1	0	0	0	0	0	2	14	88
4:15 pm	5:15 pm													
4:30 pm	5:30 pm													
4:45 pm	5:45 pm													
5:00 pm	6:00 pm													
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		32	0	20	17	2	0	0	0	0	0	4	16	91
Peak Hour Factor:		0.67	0.00	0.63	0.71	0.50	0.00	0.00	0.00	0.00	0.00	0.33	0.67	0.76

Total Arrivals			52			19			0			20		
Total Departures			33			24			0			34		
Total			85			43			0			54		

Attachment D

EXISTING LEVELS-OF-SERVICE WORKSHEETS

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	PJR	Intersection	Case1am.Int1
Agency/Co.	PRA	Jurisdiction	
Date Performed	4/13/2010	Analysis Year	2010
Analysis Time Period	AM Peak Hour		

Project Description: Pukalani Parcel 36

East/West Street: Aina Lani Drive | North/South Street: Liholani Street

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	46	0			0	39
Peak-Hour Factor, PHF	0.72	1.00	1.00	1.00	1.00	0.39
Hourly Flow Rate, HFR (veh/h)	63	0	0	0	0	100
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				10		13
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.42	1.00	0.46
Hourly Flow Rate, HFR (veh/h)	0	0	0	23	0	28
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	63						51	
C (m) (veh/h)	1505						900	
v/c	0.04						0.06	
95% queue length	0.13						0.18	
Control Delay (s/veh)	7.5						9.2	
LOS	A						A	
Approach Delay (s/veh)	--	--				9.2		
Approach LOS	--	--				A		

HCS+™ Version 5.2 Generated: 4/13/2010 8:52 AM

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	PJR	Intersection	Case1pm.Int1
Agency/Co.	PRA	Jurisdiction	
Date Performed	4/13/2010	Analysis Year	2010
Analysis Time Period	PM Peak Hour		

Project Description: Pukalani Parcel 36

East/West Street: Aina Lani Drive | North/South Street: Liholani Street

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	16	4			2	17
Peak-Hour Factor, PHF	0.67	0.33	1.00	1.00	0.50	0.71
Hourly Flow Rate, HFR (veh/h)	23	12	0	0	4	23
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				20		32
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.63	1.00	0.67
Hourly Flow Rate, HFR (veh/h)	0	0	0	31	0	47
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	23						78	
C (m) (veh/h)	1600						1005	
v/c	0.01						0.08	
95% queue length	0.04						0.25	
Control Delay (s/veh)	7.3						8.9	
LOS	A						A	
Approach Delay (s/veh)	--	--					8.9	
Approach LOS	--	--					A	

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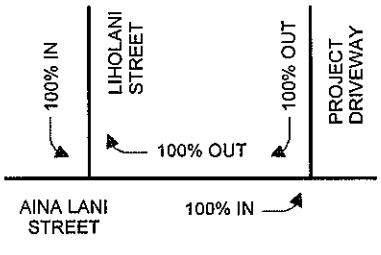
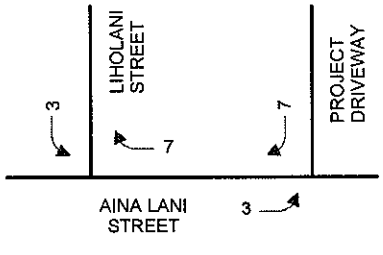
EXISTING (2010)
AM PEAK HOUR VOLUMES



AM PROJECT TRIP
DISTRIBUTION



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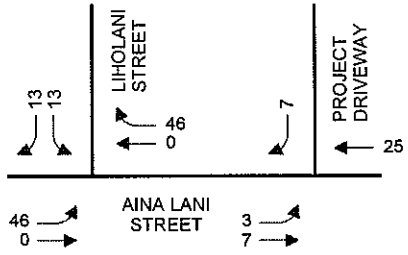
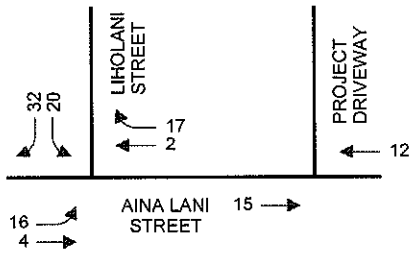
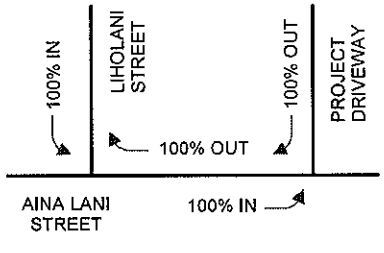
TRIP ASSIGNMENTS



2012 BACKGROUND
PLUS PROJECT
AM PEAK HOUR PROJECTIONS



EXISTING (2010)
PM PEAK HOUR VOLUMES



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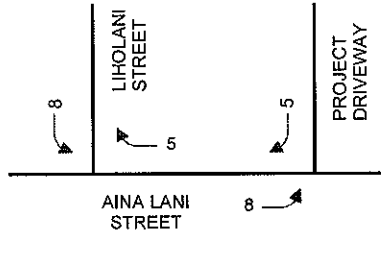

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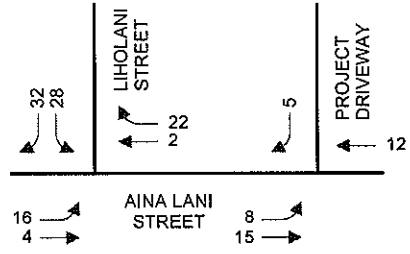
TRIP ASSIGNMENTS



2012 BACKGROUND
PLUS PROJECT
PM PEAK HOUR PROJECTIONS

Attachment E
PROJECT TRIP ASSIGNMENTS AND
2012 BACKGROUND PLUS PROJECT TRAFFIC PROJECTIONS

Attachment F

2012 LEVELS-OF-SERVICE WORKSHEETS

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*PJR*
Agency/Co.	*PRA*
Date Performed	*4/13/2010*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Case3am.Int1*
Jurisdiction	
Analysis Year	*Background Plus Project*

Project Description *Pukalani Parcel 36*

East/West Street: *Aina Lani Drive*

North/South Street: *Liholani Street*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*46*	*0*			*0*	*46*
Peak-Hour Factor, PHF	*0.72*	*1.00*	*1.00*	*1.00*	*1.00*	*0.39*
Hourly Flow Rate, HFR (veh/h)	*63*	*0*	*0*	*0*	*0*	*117*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*13*		*13*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.42*	*1.00*	*0.46*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*30*	*0*	*28*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*63*						*58*	
C (m) (veh/h)	*1484*						*875*	
v/c	*0.04*						*0.07*	
95% queue length	*0.13*						*0.21*	
Control Delay (s/veh)	*7.5*						*9.4*	
LOS	*A*						*A*	
Approach Delay (s/veh)	--	--					*9.4*	
Approach LOS	--	--					*A*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	PJR
Agency/Co.	PRA
Date Performed	4/13/2010
Analysis Time Period	AM Peak Hour

Site Information

Intersection	Case3am.Int2
Jurisdiction	
Analysis Year	Background Plus Project

Project Description: Pukalani Parcel 36

East/West Street: Aina Lani Drive | North/South Street: Driveway

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	7			25	0
Peak-Hour Factor, PHF	0.42	0.42	1.00	1.00	0.61	0.39
Hourly Flow Rate, HFR (veh/h)	7	16	0	0	40	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				0		7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.50	1.00	0.50
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	14
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	7						14	
C (m) (veh/h)	1583						1037	
v/c	0.00						0.01	
95% queue length	0.01						0.04	
Control Delay (s/veh)	7.3						8.5	
LOS	A						A	
Approach Delay (s/veh)	--	--					8.5	
Approach LOS	--	--					A	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	PJR
Agency/Co.	PRA
Date Performed	4/13/2010
Analysis Time Period	PM Peak Hour

Site Information

Intersection	Case3pm.Int1
Jurisdiction	
Analysis Year	Background Plus Project

Project Description: Pukalani Parcel 36

East/West Street: Aina Lani Drive | North/South Street: Liholani Street

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	16	4			2	22
Peak-Hour Factor, PHF	0.67	0.33	1.00	1.00	0.50	0.71
Hourly Flow Rate, HFR (veh/h)	23	12	0	0	4	30
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				28		32
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.63	1.00	0.67
Hourly Flow Rate, HFR (veh/h)	0	0	0	44	0	47
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	23						91	
C (m) (veh/h)	1591						988	
v/c	0.01						0.09	
95% queue length	0.04						0.30	
Control Delay (s/veh)	7.3						9.0	
LOS	A						A	
Approach Delay (s/veh)	--	--				9.0		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	PJR	Intersection	Case3pm.Int2
Agency/Co.	PRA	Jurisdiction	
Date Performed	4/13/2010	Analysis Year	Background Plus Project
Analysis Time Period	PM Peak Hour		

Project Description: Pukalani Parcel 36

East/West Street: Aina Lani Drive | North/South Street: Liholani Street

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	8	15			12	0
Peak-Hour Factor, PHF	0.63	0.63	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	12	23	0	0	16	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				0		5
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.63	1.00	0.67
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	7
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	12						7	
C (m) (veh/h)	1615						1069	
v/c	0.01						0.01	
95% queue length	0.02						0.02	
Control Delay (s/veh)	7.2						8.4	
LOS	A						A	
Approach Delay (s/veh)	--	--					8.4	
Approach LOS	--	--					A	

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APPENDIX F.

Reports of Community Meetings

MUNEKIYO HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 8, 2010

MEETING MEMORANDUM

Date of Meeting: January 14, 2010

From: Leilani Pulmano, Project Manager

Subject: Proposed Pulelehuakea Residential Subdivision

Participants: Carl Van Zweden, *Kulamalu Homeowners Association Board President (with IRS)*
Phyllis Bisordi, *Board Member*
Kathleen Biros, *Board Member*
Joseph Blackburn, II, *Maui Land Broker and Property Management*
Elton Wong, *KG Holdings, LLC*
Leilani Pulamo, *Munekiyo & Hiraga, Inc.*
Michael Munekiyo, *Munekiyo & Hiraga, Inc.*

Meeting Purpose: Early Consultation with Board of Kulamalu Homeowners Association

Elton Wong explained the project, entitlement plan and schedule. The Board's concerns and comments were the following:

1. Carl Van Zweden's number 1 concern is that the Kulamalu side of Aina Lani Drive and Ala Apapa Place were not dedicated to the County. All the inspections were done and approved. The issue is a sewer easement. Dowling's attorney, Tom Welch, is working with Maui County's Corporation Counsel. The Board did not fully understand the issue but is frustrated with the length of time it is taking.

2. Carl Van Zweden's concern with the roadway dedication is that the proposed project's construction would damage the improvements. Elton expressed that construction is 18 to 24 months off so they had time to work on the dedication. If not dedicated by that time, a construction deposit to fix any repairs could be provided.

3. Elton Wong explained the location of the utility connections.

4. The Board does not want ohana units which sometimes turn to rentals. The Board felt that renters do not follow the CC&Rs.

5. The Board inquired about the "building restrictions and CC&Rs". Elton Wong responded that it has not been formulated but would be interested in the Kulamalu HOA's CC&Rs or better. Joe Blackburn will provide Kulamalu's CC&Rs and design guidelines.

6. The Board wants a time limit for homeowners to build their homes. Kulamalu had 3 years from the time of sale to build their home or homeowners would be fined.

7. Construction disturbances were discussed – hours of work, bad workers, dust, etc.

8. Kathleen Biros was concerned about the loss of views. Elton suggested that a view plane analysis be completed.

9. Carl Van Zweden recognized there was zoned property on the golf course side of the Kulamalu homes and they would want to ensure that nothing gets built there.

10. The Board members want to be kept informed as project progresses.

11. In general, the Board seemed supportive.

Leilani Pulmano, Project Manager

LP:lfm
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MUNEKIYO HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

February 11, 2010

MEETING MEMORANDUM

Date of Meeting: January 20, 2010 (6:00 p.m.)

From: Leilani Pulmano, Project Manager

Subject: Proposed Pulelehuakea Residential Subdivision

Participants: Leilani Pulmano & Michael Munekiyo - Munekiyo & Hiraga, Inc.
Elton Wong – KG Holdings, LLC
Ron Huffman – Pukalani Country Club Golf Course
There were about 30 homeowners in the audience primarily from the Kulamalu Subdivision and Liholani Villas

Meeting Purpose: Early Consultation with Homeowners within 500 Feet of the Project Site

Leilani explained the project, entitlement plan and schedule to the audience. Then there were questions and answers. Below are questions, comments, and responses.

1. Elton mentioned that the project team met with the Smith and Nason families individually. A neighbor asked what the Smith and Nason's concerns were. We replied that construction damage and disturbances were pointed out as areas of concerns.
2. A neighbor asked to be kept informed and to broaden the invitation to a larger area of Pukalani.
3. A neighbor asked about the size of the lots which ranges from 15,000 to 37,000 square feet.
4. A neighbor asked where the utilities would be connected, which brought up the water source issue. There is rationing in the Upcountry area which should lead to a building moratorium because of lack of water. We responded that we were considering buying water credits from Dowling Company, a developer, and working on other options.
5. A neighbor asked about sewer capacity and thought that there were some restrictions. We replied that the sewage treatment plant was expanding and that we would check on any restrictions.

6. A neighbor expressed concerns about stormwater runoff. We explained the proposed drainage system.
7. Views were an important issue. A neighbor suggested restricting the proposed building heights to one story. We replied that a view plane study would need to be done.
8. A neighbor proposed that the project's access road come up between the two fairways and not through the Kulamalu Residences. We replied that it was much less feasible and that we had an easement over the Aina Lani Drive, which some homeowners agreed we had.
9. We talked about cutting trees on the Golf Course and one neighbor asked why has he not be able to get a tree cut. He later spoke to Ron directly about his situation.
10. A neighbor asked Ron about the plans to rebuild the golf course club house and felt this needed to be done before the proposed project.
11. A neighbor wanted to understand how sales would work. We explained that all options are available at this time such as, but not limited to:
    a. KG Holdings sells entire parcel to one builder.
    b. KG Holdings sells individual parcels.
    c. KG Holdings sells individual parcels and approve builders to build the homes.
12. A follow up question was why do the entitlement now when there is no market. We replied that this is the time to get ready for the next upswing.
13. Phyllis Bisordi pointed out the zoned property on the golf course side of the Kulamalu homes along Ala Apapa Place and the neighbors would want to ensure that nothing gets built there by rezoning it to PK, GC Park (Golf Course). A neighbor requested that it be done at the same time as the project's change in zoning.
14. A neighbor requested us to do some research on the litigation between Sports Shinko & KG Holdings regarding parcels of land.

Construction Related Comments

15. A neighbor wanted to know what the construction hours would be. It was noted that construction hours could be limited and could be in the project's CC&R's. Construction should be 8 to 10 months in duration for the subdivision.
16. A neighbor wanted to know if a dust fence would be erected. We responded in the affirmative.
17. A neighbor wanted to know the extent of construction and the grading. We replied that import and export of material would be limited; the current grades fall nicely.
18. We said that we would provide a construction contact phone number for 24-hour access.

Homeowner Related Issues

19. A neighbor asked if the CC&Rs were developed. We replied no, but we would be reviewing Kulamalu's CC&Rs.

20. A neighbor wanted there to be a time limit for homeowners to build their homes. Kulamalu had 3 years to build their home or be fined. We said that it would be considered. A few wanted this provision included in the CC&Rs.
21. The #1 concern is the Kulamalu side of Aina Lani Drive and Ala Apapa Place were not dedicated to the County. We could not fully address the issue since we did not understand the extent of the issue.
22. The concern is Kulamalu HOA owned roadway could be damaged by the project construction. We expressed that construction is several months off so they had time to work on the dedication. If not dedicated by that time, we could talk about a construction deposit to fix any repairs. We also added that the new homeowners could be part of the Kulamalu HOA that could distribute costs over more homeowners; however getting an annexation could be difficult because of votes needed to approve.
23. A neighbor asked about ohana units. We replied that ohana units could be restricted.

LPL

Leilani Pulmano, Project Manager

LP:tn
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MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 19, 2010

MEETING MEMORANDUM

Date of Meeting: March 9, 2010

From: Leilani Pulmano, Project Manager

Subject: Proposed Pulelehuakea Residential Subdivision

Participants: Members of the Kulamalu Homeowners Association Subcommittee

John Biros, 33 Ala Apapa Place, 808.573.9139
Richard Bisordi, 47 Ala Apapa Place, 808.214.5552
Boyd Mossman, 121 Ala Apapa Place, 808.244.2121
Bob Randolph, 2917 Aina Lani Drive
Carl Van Zweden, 3036 Aina Lani Drive

Elton Wong, KG Holdings, LLC
Leilani Pulmano, Munekiyo & Hiraga, Inc.

Meeting Purpose: Continue discussion with the members of the Kulamalu Homeowners Association (HOA) Subcommittee for the proposed project regarding HOA concerns.

1. Views

The subcommittee was concerned about view planes and view corridors. E. Wong explained that ribbons were tied to the pine trees, closest to the Kulamalu homes, adjacent to the project site, at 30 feet (orange ribbons) and 40 feet (yellow ribbons), to get a better understanding of the view planes. Unfortunately, the ribbons did not give a clear picture of the potential view planes. First, the ribbons should have been set at 20 feet and 30 feet. Second, the elevations were based on the golf course elevations. Third, the elevations for some of the Kulamalu homes are higher than the golf course elevations.

E. Wong stated that a cherry picker set at 30 feet may produce better results. He will inform the subcommittee when the cherry picker will be available. The subcommittee requested to be included on the view plane walk through.

A discussion on the differences between view planes and view corridors ensued. The group agreed that view planes would take a higher priority than view corridors as view corridors can be subjective to each Kulamalu homeowner.

In regards to protection of views, E. Wong expressed that the view plane analysis must first be completed to get a better understanding of the impacts. He stated that restrictions could be placed on the proposed project to protect views. To that end, he requested that a memorandum of understanding (MOU) be developed to outline the HOA's request for protection of views in return for the support of the proposed project.

2. Roadway Dedication to County

C. Van Zweden provided an update on the roadway dedication. He stated that the County has requested another inspection of the improvements. Once the inspection has been completed, the roadway dedication agreement with the County can move forward.

C. Van Zweden expressed the homeowners' concern on the HOA's liability of the roadway if it is not dedicated to the County. He requested that the proposed project share liability and costs of repairs and maintenance for the roadway if the roadway is not dedicated. He also requested that a construction deposit be provided if the roadway is not dedicated at the time of construction. E. Wong responded by asking that a MOU be established to outline each parties rights and obligations.

3. Downzoning

The subcommittee requested that the proposed project include the downzoning of the residential zoned areas on the golf course fronting homes along Aina Lani Drive and Ala Apapa Place as part of the Community Plan Amendment (CPA) and Change in Zoning (CIZ) applications. E. Wong responded by asking that this request be added in the MOU in return for support of the project.

4. Sewer Treatment Plant Capacity

As a follow up to the January 20, 2010 community meeting, E. Wong stated that the Pukalani Sewer Treatment Plant has plans to increase capacity and will be able to provide service to the proposed project.

5. ***Sports Shinko Litigation***

As a follow up to the January 20, 2010 community meeting, E. Wong stated that the Sports Shinko litigation was settled in favor of Kobayashi.

6. ***Water***

C. Van Zweden inquired about the availability of water. E. Wong stated that the County is not providing water to the proposed project. A water source will need to be identified during subdivision process. He stated that he is looking into a new water source or there is a potential to purchase water credits from Dowling Company, Inc.

7. ***Trees***

The subcommittee wanted to confirm that there may be an opportunity for trees to be removed or trimmed. E. Wong stated that this issue will need to be discussed with the Pukalani Country Club Golf Course. B. Mossman requested that trees in front of his home not be removed as he prefers "tree" views. The subcommittee was divided on the issue of removing trees.

8. ***Drainage***

C. Van Zweden inquired about a 37,000 square feet lot. E. Wong explained that this lot included a retention basin to hold any increased runoff. The basin would be maintained by the proposed project's association.

9. ***Utility Connections***

C. Van Zweden inquired about the utility connections. L. Pulmano explained the majority of the utility connections are located in the stub out street that accesses the proposed project. The sewer connection is within the golf course.

C. Van Zweden's concern regards the construction of the connections and the resulting repairs to the road to get it back up to standards. E. Wong confirmed that any roadway damage due to construction will be repaired by the proposed project.

10. ***Three Year Building Restriction***

E. Wong explained that this restriction may be too onerous. The subcommittee didn't think that this was a significant issue.

11. ***MOU***

The subcommittee is looking for some assurances on the roadway issues, view planes, and downzoning. E. Wong suggested that a MOU be written that could be recorded and run with the land to provide assurances in exchange for the HOA's support of the proposed project. The subcommittee will send a list of issues to E. Wong that they would like the MOU to address. Once the list is received, E. Wong will draft the MOU.

Leilani Pulmano, Project Manager

LP:tn

cc: Elton Wong, KG Holdings, LLC
Joseph Blackburn, Maui Land Broker & Property Management
Boyd Mossman, Kulamalu HOA Subcommittee

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MUNEKIYO HIRAGA, INC.

MICHAEL T. MUNEKIYO
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April 5, 2010

MEETING MEMORANDUM

Date of Meeting: March 24, 2010

From: Leilani Pulmano, Project Manager

Subject: Pulelehuakea Residential Subdivision

Participants: Board Appointed Kulamalu HOA Members - Boyd Mossman, John Biros, Robert Bisordi and Robert Randolph
Elton Wong – Kobayashi Group
Leilani Pulmano - Munekiyo & Hiraga, Inc.

Meeting Purpose: View Planes Analysis from the Surrounding Homes

The group walked the lots and agreed that only a few homes would be impacted by the proposed subdivision homes – two (2) lots in particular, Biros (33 Ala Apapa Place) and Bisordi (47 Ala Apapa Place).

The makai views were not impacted for the other homes on Ala Apapa Place because the homes rose in elevation or the pine trees were the predominant views. For the homes that had tree views, there were still view corridors around the proposed project site.

The ocean views for homes below 33 Ala Apapa Place was south of the proposed project.

The cherry picker was placed at certain locations within the subdivision plan. See the attached location map. The cherry picker was placed 30 feet above existing grade to the top of the bucket.

The view from Bisordi's home (47 Ala Apapa Place) was slightly impacted by the cherry picker. The cherry picker blocked a small portion of the shoreline when placed at location A.

The views from Biros' home (33 Ala Apapa Place) were not impacted by the cherry picker in locations A, B, and C. At locations B and C, the cherry picker was just visible behind a cluster of trees.

Robert Bisordi asked if the homes on Lots 1 and 2 could be limited to 25 feet in height.

L. Pulmano took pictures of the views from the cherry picker. She said there are great bi-coastal views at 15 to 20 feet (second story) at Locations A and B.

Leilani Pulmano, Project Manager

LP:tn
Attachment
cc: Elton Wong, Kobayashi Group
F:\DATA\KG Holdings\Pukalani36\032410MtgMemo.doc

Approximate Location of Cherry Picker Placed at 30' Above Grade to Top of Bucket (March 24, 2010)