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PLANNING DEPARTMENT

RECEIVED

March 31, 2000

00 MAR 31 P2:20

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
State Of Hawaii
State Office Tower, Room 702
235 South Beretania Street
Honolulu, HI, 96813

OFF. OF ENVIRONMENTAL
QUALITY CONTROL

Dear Ms. Salmonson:

**Acceptance Notice for Kapalawai Resort
Tax Map Key (4) 1-7-05: portion of 1
Final Environmental Impact Statement (FEIS)**

We are notifying you of our acceptance of the FEIS for the proposed Kapalawai Resort, as satisfactorily fulfilling the requirements of Chapter 343, Hawaii Revised Statutes.

Pursuant to procedures contained in Section 11-200-23, Chapter 200, Title 11 ("Environmental Impact Statement Rules") of the Hawaii Administrative Rules, this Acceptance Notice should be published in the Environmental Notice. Attached please find the following items:

- FEIS Acceptance Evaluation
- Four copies of the FEIS
- Completed OEQC Publication Form
- EIS Distribution Cover letter to participants
- EIS Distribution list

If you have any questions, please contact Mr. Keith Nitta at (808) 241-6677.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dee M. Crowell".

Dee M. Crowell, Director
Planning Department

Attachments

C: Helber Hastert & Fee, Planners
Destination Villages Kauai, LLC

ACCEPTANCE EVALUATION

KAPALAWAI RESORT FINAL ENVIRONMENTAL IMPACT STATEMENT TAX MAP KEY (4) 1-7-05: POR. 1

1. PROPOSED ACTION

The 153.696-acre Kapalawai property is located in the *ahupua'a* of Makaweli, in the judicial district of Waimea, on the west side of the island of Kauai, Hawaii. The property is located on a gently sloped piece of land between the shoreline and Kaumualii Highway, the respective southern and northern boundaries of the project site. Aakukui Stream marks the eastern boundary of the property, while agricultural lands owned by Robinson Family Partners and leased to Pioneer Hi-Bred International, Inc., are located to the west. The town of Waimea (population: 1,840) is located about 1/2 mile to the northwest. The town of Hanapepe (population: 1,400) is located about 2 miles to the southeast (Figure 1). The largest town on the West Side of Kauai is Kekaha (population: 3,500, located about 4 miles northwest of the project site.

The applicant requests a General Plan Amendment, in addition to other County and State land use approvals, to develop a resort and accessory facilities.

The 153.696-acre project site ("Kapalawai") is one of the former homesteads of the Robinson Family. The land comprising the property is among acreage of the Makaweli *ahupua'a* purchased in 1865 from Victoria Kamamalu, sister of King Kamehameha IV. The land is presently under the ownership of several entities, including Robinson Family Partners, Gay & Robinson, Inc., and Bruce Robinson. The residence at Kapalawai was constructed c. 1897, and was designed by Honolulu architects C.B. Ripley and Arthur Reynolds for Aubrey Robinson. The house was occupied continuously by family members until 1988. Since that time, the house has been vacant, although an auxiliary building adjacent to the residence has been used as an office for Robinson Family Partners.

The remainder of the property has historically been utilized as pasturage for livestock owned by the Robinsons, including cattle, horses, and goats. Until most recently, a number of bulls used the pasturage. In addition to the residence, and several ancillary structures, the property also features an inland fishpond, located adjacent to the Mahaikona Stream, in the center of the property.

In addition to the development of a low-intensity and low-density resort, the proposed project is intended to restore the physical attributes of the entire property to former conditions, thereby preserving a significant chapter of the history of Hawaii and Kauai. Restoration will include physical improvements to the residence, the fishpond, and the grounds.

2. PROPOSED DEVELOPMENT

The proposed resort includes 250 visitor units (or cottages) that are dispersed throughout the project site, resulting in an overall density of 1.6 units per acre. Approximately 164 of the units will be free-standing and 86 units will be constructed as 43 duplex units. Average separation distance between units will be about 40 feet. Each of the single-story cottages will be about 400 square feet in size, with a 200 square foot deck. No cooking facilities, air conditioners, phones, or televisions will be provided for the units.

One of the focal points for the proposed resort will be the former Robinson family residence. The building footprint for the residence is approximately 17,000 square feet, and includes an interior courtyard and wrap-around lanais on the exterior of the building and facing the interior courtyard. The general plan for the residence is to develop the main house and attached structures as a greeting space and as a museum, administration, and meeting room area.

Amenities provided at the resort will include:

- Two restaurants;
- Snackbar;
- Museum (in the former family residence);
- Bar/Lounge (in the former family residence);
- Three swimming pools;
- Fitness center/beach club;
- Sport courts (tennis, basketball, volleyball, badminton); and
- Amphitheater

A wastewater treatment plant is proposed to handle all wastewater generated by the project, and will be located on the northern portion of the property, between the main house and Kaumualii Highway. The wastewater treatment plant is proposed to be located with the maintenance building.

3. PROCEDURE

- A. An EIS preparation Notice for the proposed project was published in the July 23, 1999 edition of the *Environmental Notice*. The Preparation Notice was distributed to Federal, State, and County agencies, private organizations and individuals. These are listed in Chapter 12 of the Draft EIS.
- B. The 30-day consultation period ended on August 23, 1999. Twenty-three consultation letters were received. The applicant responded to substantive comments and included the appropriate information in the Draft EIS.
- C. Notice of the Draft EIS was published in the November 23, 1999 *Environmental Notice*. The 45-day public review period ended on January 7, 2000. Twenty-six consultation letter were received. All substantive comments were responded to by the applicant, and both comments and responses have been included in the Final EIS.
- D. The Final EIS was submitted to the County of Kauai Planning Department on March 31, 2000. Notice of the availability of that document will be published in the April 23, 2000 *Environmental Notice*.

4. EIS CONTENT

The Final EIS complies with the content requirements set forth in Section 11-200-18 of the State Department of Health Administrative Rules.

5. RESPONSE TO COMMENTS

The applicant responded to environmental comments that were raised during the EIS Preparation Notice and Draft EIS public review periods. These comments are found in Chapters 12 and 13 of the Final EIS.

6. UNRESOLVED ISSUES

Section 1.5 of the Final EIS identifies the necessary Federal, State, and County approvals required to complete the proposed resort. The applicant will apply for

these approvals as development of the project proceeds. Section 1.7 of Final EIS identifies two issues that are not yet entirely resolved:

A. Public Access

Section 6.7 of the Final EIS discusses existing means of public access to the Pakalas surf break, which is currently an informal agreement between the County and the landowner through a pasture which parallels the Aakukui Stream. Opinions differ on an appropriate means to formalize this access and provide other desired public facilities. Finalization of access issues will result from discussions which include County of Kauai representatives, stakeholders in the community (including surfers), the developer and the landowner.,

B. Fishpond Improvement.

Various sections of the EIS describe how the condition of the 6.5-acre inland fishpond, which is located in the central portion of the property, has deteriorated over the last few decades with accumulation of silt, and coverage of open water with vegetation. Various methods to clear the fishpond of silt and vegetation have been considered, including the use of different pieces of equipment and/or hand clearing. Specific equipment has not been identified to date. However, whatever method is used, when silt and vegetation is removed, it would need to be dewatered before disposal. Dewatering would occur adjacent to the fishpond. Spoil material would then be removed from the property and disposed on mauka agricultural lands owned by Gay and Robinson, Inc. In addition, care would need to be taken to ensure that the walls of the fishpond are not damaged. Choice of final methods and equipment would involve discussions with:

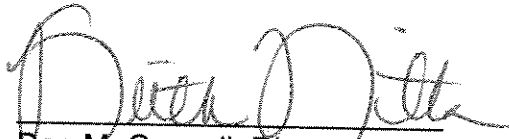
- U.S. Fish and Wildlife Service;
- U.S. Army Corps of Engineers;
- State Department of Land and Natural Resources;
- County of Kauai (Planning Department, Department of Public Works);
- The landowners; and

- The developer (Destination Villages Kauai, LLC)

7. DETERMINATION

The County of Kauai Planning Department has determined this Final EIS to be **ACCEPTABLE** under the requirements of Chapter 343, Hawaii Revised Statutes.

Approved


Dee M. Crowell, Director
Planning Department

2000 FEIS KAURI
KAPALAWAI RESORT

APR 23 2000

FILE COPY

Final
Environmental Impact Statement
Kapalawai, Kauai, Hawai'i



KAPALAWAI
R E S O R T

March 2000

Final
Environmental Impact Statement

Kapalawai, Kauai, Hawai'i

This final environmental impact statement, and all ancillary documents were prepared under signatory's direction or supervision, and the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in sections 11-200-17 and 11-200-18, Hawaii Administrative Rules, as appropriate.



Lewis P. Geysler, President
Destination Villages, LLC

3-24-2000

Date

KAPALAWAI
R E S O R T

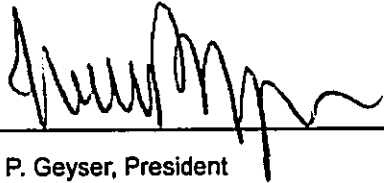
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Prepared for Destination Villages, LLC
Prepared by Helber Hastert & Fee, Planners

March 2000

Final
Environmental Impact Statement
Kapalawai, Kauai, Hawai'i

This final environmental impact statement, and all ancillary documents were prepared under signatory's direction or supervision, and the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in sections 11-200-17 and 11-200-18, Hawaii Administrative Rules, as appropriate.



Lewis P. Geysler, President
Destination Villages, LLC

3-24-2000

Date

KAPALAWAI

R E S O R T

Prepared for Destination Villages, LLC
Prepared by Helber Hastert & Fee, Planners

March 2000

REVISIONS TO THE FINAL ENVIRONMENTAL IMPACT STATEMENT

Based on comments received on the Draft Environmental Impact Statement (DEIS), a number of revisions were made to the text of the Final Environmental Impact Statement (FEIS). To facilitate review of the FEIS, additions to the text are shown as being double underlined. Text that has been deleted is ~~shown with a line through it~~. Section 4.9, related to Historic Cultural and Archaeological Resources, has been expanded to include information concerning the results of subsurface excavations. Section 5.4, related to Traditional Customs and Practices, has been rewritten to reflect comments received from the Department of Land and Natural Resources, State Historic Preservation Division.

Two graphic figures have been revised (Figure 13: Detailed Land Classification; Figure 14: Historic Sites). Figure 13 has been simplified for ease of reference, and Figure 14 now includes information pertaining to subsurface excavations.

Chapter 13 has been added to include comment letters received during the preparation of the FEIS, and response letters sent in reply to those comments.

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D	Archaeological Inventory Survey (<i>Cultural Surveys Hawaii</i>)
E	Architectural Analysis of Structures at Kapalawai (<i>Mason Architects</i>)
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H	Traffic Impact Assessment (<i>Wilbur Smith Associates</i>)
I	Utilities and Drainage Report (<i>Wagner Engineering Services, Inc.</i>)
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1

INTRODUCTION
&
SUMMARY

1.0 INTRODUCTION AND SUMMARY

1.1 General Information

Applicant: Destination Villages Kauai, LLC
C/o Destination Villages, LLC
4439 Via Abrigada
Santa Barbara, CA 93110
Contact: Mr. Lewis Geysler, President
Phone: (805) 687-8788

EIS Preparer: Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, HI 96813
Contact: Mr. Scott Ezer
Phone: (808) 545-2055

Accepting Authority: Planning Department, County of Kauai

Location: Makaweli, Kauai, Hawaii

Tax Map Key: (4) 1-7-05: portion of 1

Area¹: 470 153.696 acres

Landowners: Gay & Robinson, Inc.;
Robinson Family Partners; and
Bruce Robinson

Existing Uses: Residence; employee housing; office; pasture

Lessee: Destination Villages Kauai, LLC

Proposed Action: Development of a 250-unit resort and accessory uses

Applicable Permit: County of Kauai General Plan Amendment

¹ At the time of the publication of the Draft EIS, the area of parcel 1 was known to be 170 acres. The certification of a shoreline survey for the parcel resulted in the determination of parcel 1's area at 166.026 acres. The actual area which is the subject of the request for a General Plan Amendment (and Zoning Amendment) is only 153.696 acres, because the portion of the parcel fronting the shoreline will remain in the State Conservation District and the County Open District. All references to the area of the project site contained in the FEIS will be as "153.696 acres."

1.2 Background

The ~~470~~-153.696-acre project site ("Kapalawai") is one of the former homesteads of the Robinson family. The land comprising the property is among acreage of the Makaweli *ahupua`a* purchased in 1865 from Victoria Kamamalu, sister of King Kamehameha IV. The land is presently under the ownership of several entities, including Robinson Family Partners, Gay & Robinson, Inc., and Bruce Robinson. The residence at Kapalawai was constructed c. 1897, and was designed by Honolulu architects C.B. Ripley and Arthur Reynolds for Aubrey Robinson. The house was occupied continuously by family members until 1988. Since that time, the house has been vacant, although an auxiliary building adjacent to the residence has been used as an office for Robinson Family Partners.

The remainder of the property has historically been utilized as pasturage for livestock owned by the Robinsons, including cattle, horses, and goats. Until most recently, a number of bulls used the pasturage. In addition to the residence, and several ancillary structures, the property also features an inland fishpond, located adjacent to the Mahaikona Stream, in the center of the property.

In recent years, the property has not enjoyed a level of maintenance that would ensure the preservation of its historic assets. Although the grounds surrounding the house have been fenced off to protect against damage from grazing livestock, and irrigated and otherwise managed, the condition of the rest of the property has slowly deteriorated. The fishpond, which as recently as the 1950s was characterized by open water, has since collected silt and is overgrown with bulrush, California grass, and floating aquatic plants, such as water hyacinth, duckweed, and water lettuce. Only recently, was vegetative debris associated with damage from the two most recent destructive hurricanes, Iwa and Iniki, removed from the pasture.

In addition to the development of a low-intensity and low-density resort, the proposed project is intended to restore the physical attributes of the entire property to former conditions, thereby preserving a significant chapter of the history of Hawaii and Kauai. Restoration will include physical improvements to the residence, the fishpond, and the grounds. In addition to these restoration efforts for the property, the proposed project will provide economic stimulus for the West Kauai community, and the community at large. This economic impact will be felt directly by Kauai residents in general, and West Kauai residents in particular, in the form of employment opportunities afforded by the proposed

project. Other indirect impacts will accrue by virtue of the spending habits of the guests of the proposed resort, which will be felt by a wide variety of businesses in the West Kauai community and elsewhere on Kauai.

The profile of the target visitor to the Kapalawai Resort is also an important consideration for the design of the project, and their impact on West Kauai. The term "eco-tourism" has been used to describe a wide variety of visitor-types. What is eco-tourism? Ecotourism has been defined as "responsible travel to natural areas which conserves the environment and improves the welfare of local people." Ecotourism is alternatively termed as "ecological tourism" or "sustainable tourism." All of these terms and the type of visitor they describe are considered to be specific categories of the more broad "nature-based tourism." Another definition suggests that ecotourism is "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature, that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations". It is the visitor who will be respectful of the history preserved at Kapalawai, the culture of Kauai, and the natural beauty of the island.

The scale and design of the proposed resort is intended to complement the physical, social, and scenic characteristics of the region. The consideration of these elements were given prime importance in the development of the preliminary site plan for the project, and affected its scale and preliminary architectural themes.

1.3 Summary of Probable Impacts and Mitigation Measures

PHYSICAL ENVIRONMENT

Topography. The overall development program will not affect a large portion of the project site. The cottages will be raised above grade (to comply with flood hazard requirements). Therefore, site alteration for these facilities will be minimal. The other major structural additions to the project site (two restaurants, the snack bar, the tennis clubhouse) will also be elevated to comply with flood hazard regulations. This method of construction (post and beam) involves less ground disturbance, and, therefore, less alteration of topography.

Roadways and parking lots will change the surface characteristics of about seven acres of the property (about 4 percent of the entire site) from pervious to impervious. Although surface characteristics will change, the general topographic

features of the property will not change, primarily because slopes are so small (1-4 percent).

The proposed drainage plan (See Section 6.4) requires that the an existing man-made drainage ditch be improved as a six-foot deep trapezoidal grass channel, with a bottom width of 30 feet and an overall top width of 54 feet, along a length of about 2,300 feet. In general, the overall topography of the property will not be changed, and existing drainage courses will continue to be utilized. As a result, there will be no significant impacts to topography.

Hydrogeology. There will be a beneficial impact associated with drawing water from the fishpond for irrigation use in the form of better overall water quality within the fishpond. Increased withdrawal will result in increased turnover (decreased residence time), with a resultant decrease in the presence of algae and phytoplankton. Consequently, turbidity would be reduced. The water level in the fishpond could drop slightly with increased withdrawal, but would ultimately reach equilibrium balancing input and throughput.

Agricultural Capability. Over the time period the project site has been owned by the Robinson family, it has never been used for commercial agriculture. The family did use the property for subsistence raising of fruits, vegetables, and livestock, including fish (in the fishpond). As recently as this year, portions of the project site were used as pasturage for about 20 bulls. However, these animals have since been removed. Therefore, the development of the project site as a resort will have no impact on agricultural production on Kauai.

Flora. None of plants inventoried on the site is a threatened or endangered species; nor is any plant a species of concern. All of the plants identified on the property can be found in similar environmental habitats throughout the Hawaiian Islands. In this context, there will be no significant impacts to native vegetative habitats resulting from development of the proposed project.

Areas of the project site will benefit from development because irrigation water will be made available that will be able to support more plant life. This will also help to prevent soil erosion caused by the wind. From a botanical perspective, the presence of large numbers of the long-spined mesquite species (Prosopis juliflora) on the coastal area of the property are a primary concern. To date, the plants have only been known from Oahu at Sand Island and vicinity. If not eradicated, the plants could form large, impenetrable, spiny thickets in low land, dry habitats throughout Kauai.

It is recommended that all individual Prosopis juliflora plants be eradicated. Appropriate methods of eradication should be coordinated with the State Department of Agriculture.

It is also recommended that native plants be incorporated into the landscape plan for the proposed resort.

Terrestrial Fauna. The project site has been significantly altered by introduced vegetation and ranching activities. No unusual or unexpected species were recorded, even though three endangered species were observed on the property: Common Moorhen (Gallinula chloropus); Koloa (Anas wyvilliana); and Hawaiian Hoary Bat (Lasiurus cinereus semotus).

Although endangered, the Hawaiian Hoary Bat is fairly common on Kauai. The proposed development should not adversely impact foraging opportunities for the bats. They are known to forage in urban as well as forested habitats.

Although there are several wetland type habitats on the project site, most are overgrown with emergent vegetation. This restricts their access to waterbirds. If these areas were opened up by removal of vegetation, they would provide better habitat for waterbirds. A complete removal of vegetation in the fishpond would not be attractive to native waterbirds because they require some cover (in the form of emergent vegetation) to avoid predators or as a place to retreat when disturbed. Existing vegetation should be maintained on the island in the middle of the fishpond for this purpose. The advantage of focusing vegetation on the island would be that the island would provide cover and nesting opportunities that would be protected from cats and other predatory animals.

The man-made marsh area on the Waimea side of the property will lose its source of water in the near future as a detention basin being built by Gay and Robinson, Inc. is completed mauka of Kaumualii Highway. This will cause the area to dry up and lose its wetland characteristics. However, the loss of this area will not be significant because of the presence of the fishpond and other habitats associated with the Mahaikona and Aakukui Streams. This is particularly true if the fishpond and streams are cleared, thereby creating additional open water habitat.

Marine Environment. The overriding findings of the marine environmental assessment is that at present, both water quality and biotic community

composition are strongly influenced by terrigenous sediment in the nearshore ocean that appears to originate from runoff from upland drainage basins, and maintains a long residence time within the shoreline fronting the project site. Hence, even if delivery of sediment is halted, it appears that the material presently on the bottom would remain in the system for an extended period of time.

Plans for the Kapalawai Resort specify usage of an on-site wastewater treatment system that will result in effluent (reclaimed water) for use as an irrigation source on the property. As a result, none of the wastewater generated by the project will be discharged directly to the ocean. It is anticipated that this method of wastewater disposal will have no impact to the marine environment.

While the planned project at Kapalawai may result in a temporary increase in exposed soil during the construction that could reach the ocean through runoff, it is likely that such an increase would be essentially undetectable when compared to the existing situation, and best management practices during construction will mitigate the impacts of erosion. The increased impervious surfaces that will result from the construction of roadways on the property may actually reduce sediment delivery to the ocean as the roadways will replace lands otherwise subject to erosion.

Potential Effects to Protected Species. The threatened green sea turtle occurs in the nearshore areas off the project site. Because there is no plan for any work on the shoreline or in the nearshore region, there is no potential for activities that might affect health or behavior of turtles (or any other protected species). Potential changes in water quality that might occur as a result of construction would be undetectable, and hence would not affect turtle behavior.

The shoreline bordering the property is sand, and it is possible that turtles could haul ashore. While it has not been documented that the area serves as a turtle nesting ground, such activities are potentially possible.

Similarly, the beach presents the possibility as a haul out area for monk seals. Transplanted seals have been documented to frequent many areas in the high islands. As such, human intervention to endangered species populations has resulted in increasing the potential for interactions between humans and the endangered species. As a result, it appears that the Kapalawai area has the same potential for monk seal habitation as any other beach locale on Kauai.

The potential for impacts to marine communities as a result of development of the Kapalawai Resort appear to be minimal or nonexistent. None of the developmental activities appear to have the potential to induce long-term changes in physic-chemical water quality parameters of a magnitude sufficient to cause changes in biological community structure. The marine environments off Kapalawai (as is the case around much of the Island of Kauai in regions where sugar cultivation takes place) appear to have been subjected to substantial sediment stresses for a sufficient period of time (many decades) to have influenced community structure. Such stresses are much more destructive than the small temporary changes that could result from construction of the proposed development activity. If some unexpected event related to development activities does occur, the resulting alterations to marine community structure would probably be reversible and recovery rapid once the stress factor is mitigated. Tolerance to such changes appears to already be part of the physiological range of the community.

In order to ensure that land use activities do not alter behavior of green sea turtles or monk seals that haul out, it is recommended that project lighting in areas near the shoreline be designed so as not to illuminate the beach strand. In addition, employees of the resort, and its guests should be educated about possible interaction with these animals, and appropriate human behavior for that interaction. For employees, this information could be included in training sessions and handouts. For guests, information, in the form of brochures, could be placed in all cottages and signage erected in key locations on the property,.

Historic, Cultural and Archaeological Resources. A total of six sites were identified and recorded with the State Historic Preservation Division as a result of an inventory survey conducted for this project. Many of the structural historic sites identified on the project site will be retained and efforts will be made to restore them. Buildings in this category include: the former Robinson family residence (Site 764A); the former guest house (Site 764B); and the former servants quarters (current offices for Robinson Family Partners) (Site 764C); and the eight employee dwellings (Sites 764G through N). Other structures will be demolished because they are in such poor condition. Buildings in this category include: the former carriage house/garage (Site 764D); the remnants of the former saddle house (Site 764E); and the former plant house (Site 764F).

The structures being retained have been surveyed to determine their condition and to identify required repairs. All repairs will be implemented to match original

materials and design to the greatest extent possible, so the exterior appearance of these buildings will remain intact.

A significant portion of the interior of the former residence (existing dining, sitting, library, pantry, china, linen rooms, as well as one guest bedroom and the original kitchen building) will be maintained as museum space, and will be repaired and restored to match original materials and design.

The fishpond will be cleared of exotic vegetation and restored to an appearance similar to that of the late 19th century and the first half of the 20th century. The exact method of pond clearance has not been determined, so impacts to the pond are difficult to determine at this time, and it is not known what type of heavy equipment will be required, if at all. If large heavy-equipment vehicles are needed, they could possibly impact the extant pond rock walls, if the full weight of the vehicles is brought to bear on the walls. Appropriate actions should be implemented to ensure protection of extant fishpond walls during any activity to clean out the fishpond. A mitigation plan will be prepared for the restoration of the fishpond. These actions mitigation plan should be reviewed by the Department of Land and Natural Resources State Historic Preservation Division prior to commencement of any such activity. Additionally, there is a pohaku (rock) in the fish pond associated with a mo'o wahine legend, which could not be found due to vegetation and debris. It is recommended that before restoration work on the fishpond begins, this pohaku should be located and preserved in place.

Three other historic sites, the Portuguese Oven (Site 766), the rock platform (Site 763), and a series of rock walls and terrace (Site 762) will be preserved as-is and integrated into the site design of the project.

The Portuguese Oven should be clearly marked with an appropriate buffer area to prevent accidental damage during construction.

Feature 50-30-9-792/A, the cultural layer, is recommended for preservation for future archaeological research. The preservation plan will outline the short-term and long-term preservation measures that will safeguard the feature from damage during project construction and subsequent land use

Feature 50-30-9-792/B, the human burial, is recommended for preservation in place within the combination archaeological and burial preserve area. The preservation of the burial will require the preparation of a burial treatment plan. As a previously recorded burial site (so designated because it was found during

inventory survey investigations) the mitigation and treatment of these skeletal remains fall under the jurisdiction of the Kauai Island Burial Council, who must approve all mitigation and/or treatment measures. The request for preservation in place must be presented to the Burial Council in the form of the burial treatment plan.

Scenic Resources. The interior of the project site is not currently visible from Kaunualii Highway because of the dense vegetation on the mauka portion of the property. Consequently, development of the proposed resort will not be visible from the highway.

The existing entry drive into the property will be formalized for the resort, thereby undergoing some modification, including the installation of a left-turn storage lane on the Waimea-bound side of Kaunualii Highway, and a right-turn deceleration lane on the Hanapepe-bound side of the highway. In addition, a new exit drive for the property will be created about 500 feet on the Hanapepe side of the entry drive.

Appropriate signage and landscaping is recommended for both the entry and exit drives to the Kapalawai Resort. These improvements should be kept in character with the region, and signage should be indirectly illuminated.

Flood Hazards. Many of the structures in the proposed Kapalawai Resort are affected by flood hazards in the AE and X zones, with flood elevations ranging from one to about five feet above existing grade. All habitable floors will be raised above the base flood height. No structures are planned to be built within the area affected by the zone of inland overwash from the storm surge associated with Hurricane Iniki.

All affected structures will be constructed in compliance with flood hazard regulations, which require: (1) securely fastened columns to resist flotation, collapse, and lateral movement; and (2) certification by a registered professional engineer or architect.

Air Quality. Short-term Impacts. The principal source of short-term air quality impacts associated with the proposed project will be construction activity, including construction vehicle emissions and particulate emissions connected with clearing, grading, grubbing and other site preparation work, and construction equipment and workers traveling to and from the project site.

Operational Impacts. Two sources of air quality impacts could result from the operation of the resort: (1) increased vehicle emissions due to increases in traffic volume; and (2) fugitive dust from disturbance of dry exposed soil.

After construction of the resort is completed, use of the proposed facilities will result in increased motor vehicle traffic on nearby roadways (from about 6% to 20%, depending on day and time of day; see Section 6.1) which could potentially increase air emissions in the project vicinity. The use of some electric-powered vehicles by the resort will reduce on-site emissions.

Increases in vehicular emissions will probably not have a significant impact in the vicinity of the project site because traffic flow is smooth and normal wind patterns prevent the accumulation of emissions. In addition, the elimination of lead-based gasoline has eliminated this source of motor vehicle-created pollution.

Compliance with State of Hawaii Air Pollution Control Regulations (Title II, Chapter 60.1, Hawaii Administrative Rules) will ensure reduction of fugitive dust related to construction activities. Reasonable precautions, or best management practices (BMPs) include:

- use of water on exposed soil (twice daily, if necessary);
- covering all moving, open-bodied trucks transporting materials which may result in fugitive dust;
- use of wind screens to prevent migration of fugitive dust, as appropriate;
- prompt removal of earth or other materials which have been temporarily stockpiled; and
- limiting the land area exposed by construction

Because of the dry nature of the climate in the region, fugitive dust will always be a concern. In order to minimize fugitive dust, care must be taken to avoid patches of exposed soil.

Noise. Development of the Kapalawai Resort will involve grubbing, grading, some excavation, and the construction of infrastructure, cottages, restaurants and other accessory facilities. Actual noise profiles generated by these activities will depend on the construction methods employed during each phase of the project. Typical ranges of construction equipment will range from less than 60 dBA for pumps and vibrators, to almost 100 dBA for jack hammers and rock drills. Earthmoving equipment, such as bulldozers and diesel powered trucks will probably be the loudest equipment used during construction.

The closest sensitive receptor is several hundred feet from the nearest point of construction activity, and there is a heavy growth of vegetation separating the areas. Therefore, sound from construction operations will be greatly attenuated before reaching any nearby dwellings. Therefore, noise impacts attributable to the construction period are expected to be minimal, and of a temporary nature (12-15 months).

Potential noise sources attributable to the operation of the proposed resort include:

- use of lawn mowers and other landscape maintenance tools;
- pumps associated with the wastewater treatment plant and irrigation systems; and
- arrival and departure of supply, guest, and employee vehicles

Typical A-weighted noise levels at a 50-foot distance for the landscape equipment range from 74 dBA for a lawn mower to 82 dBA for a chain saw. The nearest noise sensitive areas would be residences located several hundred feet away. Due to the distance of separation, these noises should not have any adverse impact on neighboring residences.

The pumps for the wastewater treatment plant and the irrigation system will be located within buildings, which will limit their impact. In addition, these are no sensitive receptors in the immediate vicinity. Therefore, no significant off-site noise impacts are anticipated related to on-site mechanical equipment.

All construction vehicles must meet Title II, Administrative Rules of the Department of Health, Chapter 42, Vehicular Noise Control. All construction activities must meet the provisions of Title II, Administrative Rules of the Department of Health, Chapter 46, Community Noise Control.

SOCIO-ECONOMIC ENVIRONMENT

Population Impacts. Based on 250 developed cottages with an occupancy of 1.95 people per unit, and an average overall occupancy rate of 75 percent for the resort after three years, Kapalawai could be expected to accommodate an average of about 365 visitors per day (by 2004). In addition, about 143 operational employees would be present on an average day. On average, Kapalawai could also have about 240 construction workers on-site on any given

day during 2001. These figures represent the total number of persons anticipated to be on-site over a 24-hour period.

The Kapalawai Resort is not anticipated to lead to any significant migration from out-of-State. However, to the extent that persons do move to the State because of its development, such in-migrants can be expected to reside in housing or transient accommodations located off-site.

Economic Impacts. The Kapalawai Resort could be expected to impact the economies of the State and the County of Kauai by: (1) attracting visitors who would make new expenditures; (2) generating construction activity, which would support expenditures for goods and services; and, (3) creating and supporting jobs and business enterprises in its ongoing operations. The new jobs would in turn generate additional business and personal income in the County and throughout the State.

Direct, indirect and induced positions could total 710 person-years of labor for construction at Kapalawai. Including its direct, indirect, and induced impacts, the project's development could support some \$30.2 million in wages and salaries for Hawaii residents during construction.

Direct operational jobs are projected to stabilize at about 200 full time equivalent positions. These new employment opportunities will include a variety of types and levels of work, such as opportunities in management, sales and marketing, registration/reservations, human resources, food service, maintenance and engineering, housekeeping, grounds keeping, and related activities. The majority of these jobs would be located on-site.

Based on economic multipliers derived from the State of Hawaii's Input-Output Study (DBED&T, 1998), the total employment impacts of Kapalawai, including its indirect and induced jobs, could represent about 320 full time equivalent (FTE) positions throughout the State.

Direct wages and salaries paid to those employed in the resort's operations are expected to reach about \$5.3 million per year. Including personal income associated with the indirect and induced positions, the project could generate nearly \$12.3 million per year in ongoing payroll within the State.

In total, direct visitor expenditures are estimated to represent \$17.8 million in 2002, increasing to about \$21.2 million by 2004. Including the indirect and

induced multiplier effects within the State, visitors attracted by Kapalawai could account for over \$36 million in new annual visitor expenditures by the time of project stabilization.

Fiscal Impacts. County Real Property Tax Revenues. The most significant fiscal impact of the proposed resort for the County of Kauai is likely to derive from the higher real property taxes generated compared to those paid under its current land use designations and level of development. After adjustments for the property taxes now paid for the project site, Kapalawai is anticipated to generate approximately \$420,000 annually in net new property tax revenues by 2003.

Other County Revenues. In addition to real property taxes, the County of Kauai is currently allocated a share of the transient accommodations taxes (TAT) collected by the State (6.5 percent of State TAT collections), and it obtains liquid fuel, utility franchise, motor vehicle weight, and other licenses and permit fees from residents and businesses.

Given the expenditures for bungalow revenues projected to be generated by out-of-State visitors to Kapalawai, the State's 7.25 percent TAT, and Kauai County's 6.5 percent share of State TAT collections, this could represent about \$50,000 in annual TAT revenues for the County by 2003.

In summary, net new taxes earned by the County as result of the development of Kapalawai Resort and its future operation could represent about \$470,000 per year, on an on-going basis by 2004.

Additional State Government Operating Revenues. Additional operating revenues accruing to the State government are expected to derive principally from the general excise tax (GET) accruing from out-of-State visitors' expenditures in Hawaii. Other sources of new State revenues attributable to the Kapalawai Resort include its share of TAT, as well as GET, income and other taxes paid by those who move to the State because of the project, and GET on the project's development costs.

In total, new operating revenues for the State are estimated to amount to some \$1.3 million annually by project stabilization in 2004.

Per Capita Government Operating Expenditures. Both State and County governments can be expected to incur additional operating expenses in supporting the in-migrants that are attracted by the development of the

Kapalawai Resort. An analysis of the County of Kauai's 1995/1996 fiscal year expenditures suggests that the County spends about \$1,900 per resident per year, and about \$1,170 per full-time equivalent visitor-year. A similar analysis of State government operating expenditures per capital suggest that the State spends about \$4,970 per year to support governmental operations on behalf of each resident, and \$1,840 per full-time equivalent visitor year.

Net Fiscal Benefits. County government operating revenues from the proposed Kapalawai Resort are anticipated to exceed additional operating expenses by \$60,000 per year, as the project approaches stabilized operations (about 2004). The revenue/expenditure ratio for this relationship is projected to be 1:1.

On the other hand, with its far greater taxing powers and more varied sources of income, the State government's operating revenues are anticipated to substantially exceed the additional operating expenses (\$760,000) associated with the project throughout its development and operating periods. The revenue/expenditure ratio for this relationship is projected to be 2:4.

Traditional Customs and Practices. A native Hawaiian traditional customs and practices impact assessment for the proposed project was prepared for the EIS. The purpose of the impact assessment was to consider the effects the proposed development may have on native Hawaiians as it pertains to their traditions and customs which are protected by law under the Hawaii State Constitution, Article XII, Section 7. Historical documents and maps were researched at the Hawaii state Archives, the Bernice Pauahi Bishop Museum Archives, the Kauai Historical Society, and the Kauai Museum. In addition, seven in-depth interviews were conducted with a total of nine people. For the past century, due to the exclusive use of the property by the Robinson family and its employees, except for Warren Robinson and Bruce Robinson, the majority of the interviewees were past employees of the Robinson family and had either worked and/or lived at the project area of Kapalawai at some time during their employment.

The interviews were a valuable part of the assessment for providing useful information about people, land use, boundaries and place names, and also helped to explain the lack of cultural practices within the project area.

Investigations for the assessment study have failed to turn up evidence of traditional customs and practices ~~in the 170-acre parcel known as~~ at Kapalawai. The lack of such evidence reflects the geographic location of the parcel as well as the nature of the land tenure. It is clear from the historic records that Kekupua

Fishpond was reserved for the chiefs and, thus, the mullet would have been kapu to the native tenants. When Eliza Sinclair acquired Makaweli ahupua`a, she controlled the whole ahupua`a and its resources, which would have included the fishpond. It is evident that she continued the practice of reserving the mullet for personal use and keeping the pond resources kapu to the native tenants.

A document search did not disclose any *kuleana* (native tenant) claims within the project area. Oral interviews, which were a part of this assessment, did not indicate that there was a Hawaiian settlement of any kind within the project area. Archaeological evidence and research of Hawaiian trails within the *ahupua`a* support the settlement of larger inland population as opposed to a coastal one.

The Robinson family has owned the *ahupua`a* of Makaweli, which includes Kapalawai, since 1865. Because Kapalawai was utilized by the family as a ranch, farm, and dairy, and because the Family preferred complete privacy regarding all of their lands, it was not possible for outsiders to go onto the property unless they had been invited or had received permission to do so. Thus, if any traditional customs and had been carried out at Kapalawai prior to the Family's arrival, these were most likely discontinued during the 135 years of the Family's ownership. Thus, if any traditional customs and practices had been carried out at Kapalawai prior to the family's arrival, these may not have been possible during the 135 years of the family's ownership. Anyone who might have been pursuing these customs and practices has long since passed away. During the oral history phase of this assessment, none of the interviewees could recall being told by their elders of any significant or documented cultural practices in the project area.

As a result, it is not likely that Hawaiian traditional customs and practices will be significantly affected by the proposed development. Based on the past history, it is the conclusion of the assessment that the proposed development will have little or no impact on Hawaiian culture.

PUBLIC FACILITIES

Transportation. Construction Period Impacts. During construction of the project, there will be an increase in the number of trucks and other construction vehicles, including employees, that will be entering and exiting the property. Vehicles making left turns into the property from Kaumualii Highway may cause traffic to temporarily back up behind them. This potential impact should be minimized because direction of travel will be counter to peak directional flow, and the

duration of disruption would be temporary, for the approximate one-year construction period.

Operational Period Impacts. The Kapalawai Resort is planned for completion and full operation by early year 2002. The traffic assessment reflects a peak season level of use of the project for both a weekday and a Saturday.

The project is estimated to increase the peak hour volumes on Kaumualii Highway just to the east of the site by 8% during the weekday peak hours and by 20% on a Saturday with special events at the site. To the west, the project traffic would add an estimated 6% increase to the weekday peak hour volumes and 18% to the Saturday peak hour volumes on Kaumualii Highway near the site.

The left-turn movements into and out of the Project driveway connections to Kaumualii Highway are forecast to operate at very acceptable conditions for each of the peak hour periods. The vehicles turning left from the mauka-bound exit driveway would operate at Level of Service (LOS) C during each period. The left-turn movement from westbound Kaumualii Highway would operate at LOS A with the forecast volumes.

Based on the forecast peak hour volumes and traffic conditions, STOP sign controls would be appropriate for the exit driveway.

In an effort to minimize traffic disruptions during the morning and afternoon peak hours, the start and finish times for work crews during the construction period should be timed to avoid these periods. Likewise, delivery of materials and heavy equipment should also avoid morning and afternoon peak hours.

It is recommended that the left-turn storage lane discussed below (to mitigate operational period traffic impacts) be constructed as soon after final permit approvals as is practicable. This action will also mitigate stacking of vehicles making left turns into the property during employee arrivals.

It is also recommended that personnel be stationed at the exit points to the property during periods of high volume of deliveries and arrival of heavy equipment to assist in the direction of traffic.

The analyses indicate that STOP sign control is appropriate for the exit driveway approach to Kaumualii Highway for the year 2002 peak hour conditions.

Because of the vehicular speeds along this section of Kaumualii Highway, it is recommended that a left-turn lane be provided for the vehicles waiting to turn left from westbound Kaumualii Highway into the project entrance driveway. This would reduce the potential for accidents as well as delays to through traffic. The length of the left-turn storage lane should be sufficient to accommodate at least 3 or 4 waiting vehicles, or a minimum of 100 feet in length.

Separate left- and right-turn lanes are recommended for the exit driveway at the intersection with Kaumualii Highway to minimize any delay to vehicles turning right from the driveway.

A right-turn deceleration lane is recommended on westbound Kaumualii Highway at the entrance driveway for the Project for safety purposes and to minimize delays to through traffic.

Utilities. Electric/Telephone/Cable. Utility services will be brought underground from one or more of the several utility poles fronting the project site on Kaumualii Highway, and looped through the development to serve the various buildings within the project. High voltage primary electric service will be extended to several points within the property and transformed for service to all facilities.

Water. A dual, private, potable/irrigation water system is proposed for the Kapalawai Resort. Both systems will be privately developed and operated because service from the Kauai Department of Water (DOW) is not available in this area.

The choice to develop a dual (potable and irrigation) water system will take advantage of the supply potential of the spring-fed fishpond. Drawing water from this pond will augment its natural turnover rate, improving its water clarity while providing irrigation supply. It also allows elements of the potable system to be downsized accordingly.

Based on use rates in accord with DOW standards, it is estimated the year-round average potable water use to be approximately 0.12 million gallons per day (MGD). Peak seasonal use could be about 50 percent higher, or approximately 0.18 MGD. Year-round irrigation use for the project is estimated to be 0.36 MGD. In the summer months, the rate could be as high as 0.66 MGD (Nance, 1999).

Wastewater. A private wastewater treatment plant (WWTP) will be constructed on-site to handle all wastewater generated by the proposed resort. Elements of the proposed system includes:

- 14,600 linear feet of gravity sewer main;
- 15,500 feet of sewer laterals;
- 4,200 linear feet of force main;
- 44 sewer manholes,
- 4 sewage pumping stations, and
- 1 wastewater treatment plant.

Taking into consideration loss of potable water, peak diurnal flows, and infiltration, the WWTP must therefore be sized for an average flow of approximately 0.12 MGD, and a peak flow of 0.53 MGD.

A wastewater treatment plant produces a solid product (sludge, or biosolids), and a liquid product (effluent) for disposal or reuse. The biosolids can be safely disposed at the County of Kauai's Kekaha Municipal Landfill, as the County does with the biosolids from its own wastewater treatment plants. The best possible use of the effluent, especially on the west side of Kauai, where weather is hot and dry and water is a precious resource, is to recycle the effluent as irrigation water. Irrigation will be the method of choice at Kapalawai.

The use of reclaimed water will be accomplished in compliance with the State Department of Health's *Guidelines for the Treatment and Use of Reclaimed Water*.

Grading and Drainage. Drainage systems are proposed in certain areas to control stormwater runoff for access roads and parking areas. Peak flow runoff for a 100-year storm event from the overall project site will increase from about 310 cubic feet per second (cfs) in an undeveloped condition to about 589 cfs in a developed condition. The increase of 279 cfs for the 100-year storm event is insignificant (2.5%) when compared to the total peak offsite flow of 10,863 cfs from three mauka watersheds which are tributary to the property. Therefore, impacts to near coastal water quality will not be significant.

A preliminary drainage plan for the proposed resort includes a six-foot deep trapezoidal grass channel, with a bottom width of 30 feet and an overall top width of 54 feet. This drainway will follow the same draincourse as an existing man-made ditch. The new channel will route runoff through the west portion of the site

and outlet into a retention basin mauka of the shoreline, which will allow for sediment collection and controlled release. This grass channel will accommodate the 100-year storm with two feet of freeboard.

Other improvements include storm drain systems that will drain the western portion of the main parking lot, a storm drain system for the eastern portion of the main parking lot, the roadway to the main restaurant, and its parking lot, and a storm drain system for the parking area and roadway on the eastern portion of the property, that will outlet into Mahaikona Stream. The remainder of the site shall be graded to approximate the existing condition, to promote existing sheetflow runoff from the property.

Proper and regular maintenance of the existing streambeds and the proposed grass-lined channel is essential to ensure maximum flood protection for the project. Maintenance of Aakukui Stream, which is currently overgrown in some places, will significantly improve its capacity.

Solid Waste. Base upon other resorts in Hawaii, a project the size of Kapalawai can be expected to generate 70 to 90 cubic yards (cy) of waste per week.

The Kapalawai Resort will implement an aggressive recycling program to minimize its impact on the County's diminishing capacity at the Kekaha Landfill. Much of the 70 to 90 cy of solid waste anticipated for Kapalawai is recyclable, in the form of cardboard, glass, aluminum cans, paper and some plastic. The proposed resort should be able to recycle about 15% of its solid waste. In addition, some food waste and green waste should also be recyclable.

Recreational Facilities. The existing recreational resources in West Kauai are diverse, vast, and exceptional, and they contribute to the overall quality of life for its residents. The addition of about 365 persons per day (Kapalawai Resort guests on an average day) to the defacto population of the Waimea District, will add to the demand on recreational resources. However 365 people represent only a 3.9% increase above the 1995 resident population of 9,220 for the Waimea District, and a 0.5% increase to the defacto population of 69,900 for the entire island. Many of the recreational facilities in the Waimea District (such as Waimea Canyon State Park, Kokee State Park, Na Pali Coast State Park, Polihale State Park) attract users from all over Kauai, including visitors. In this context, the increased demand resulting from potential Kapalawai Resort guests will be marginal. This is particularly evident when examining the area of many of these facilities. For example, Kokee State Park and Waimea Canyon State Park

are 4,345 acres and 1,866 acres in size, respectively, and offer numerous hiking, picnicking, hunting, and camping opportunities.

The project site will offer some recreational amenities to guests, thereby minimizing off-site impacts. These activities include tennis, swimming, beachcombing and walking. Therefore, some recreational demand for Kapalawai guests will be met on the property. As a result, overall impact to any single off-site recreational resource is not expected to be significant.

The development of a resort at Kapalawai will also provide on-site recreational opportunities for Kauai residents, in the form of increased shoreline access to pursue activities such as fishing, diving, beachcombing, and picnicking, in addition to surfing. As a result, there will be a beneficial impact on recreational opportunities for Kauai residents.

Shoreline Access. At the very least, current access to the Pakalas surf break, paralleling the Aakukui Stream, will remain as-is. Discussions with community members indicate there may be a difference of opinion concerning the most appropriate form of beach facilities for Kapalawai at the Aakukui Stream end of the property. Various facilities have been proposed including, a parking area, restroom, shower, and a formal path to the ocean. Other suggestions have been to leave the current access as-is, with no additional formal facilities.

Adequate additional access will be available from parking areas within the resort, where sufficient parking spaces will be reserved for public use. In this context, access to the shoreline will be improved.

Discussions with community representatives (including surfers), officials from the County of Kauai, the landowners, and the developers are necessary to develop a consensus on appropriate an overall access plan for the property that meets the needs of the community and satisfies the requirements of Chapter 205A, HRS.

Police/Fire/Emergency/Services. In general, impacts to police services are not anticipated to be significant, provided the resort provides on-site security, based on experience with other facilities in Koloa and Poipu. The Fire Department has indicated that if the developer provides a private fire protection system consisting of storage tanks, lines, stand pipes, and access roads (to the cottages), existing fire protection equipment and manning should be sufficient to serve the development. Emergency services staff indicated the proposed project would not require the addition of staff or equipment to the resources in the region.

1.4 Alternatives Considered

In addition to the "no-action" alternative, the following development alternatives were considered for the project site:

- High Density Resort
- Golf Course
- Mixed Use Resort/Commercial/Residential
- Residential Development

None of the alternatives considered were considered appropriate for the property, or for the West Kauai community. Various reasons for rejection of these alternatives include:

- Higher density use would not complement the historic nature of the existing family residence and the fishpond without overwhelming these historic resources;
- Higher density would significantly increase traffic on Kaunualii Highway;
- Higher density would require the provision of increased infrastructure;
- Higher density would not complement the existing scale of development in West Kauai
- The condition of the on-site fishpond would continue to deteriorate;
- The former family residence would not be restored and maintained.

Each of the alternatives is discussed in Chapter 7.

1.5 Unresolved Issues

There are two unresolved issues related to the development of Kapalawai Resort: (1) the framework for public access to the shoreline; and (2) the specific method that will be used to remove silt and vegetation from the fishpond located on the property.

Public Access. Section 6.7 of the EIS discusses existing means of public access to the Pakalas surf break, which is currently an informal agreement between the County and the landowner through a pasture which parallels the Aakukui Stream. Opinions differ on an appropriate means to formalize this access and provide other desired public facilities. It is probable that finalization of access/public facilities issues will result from discussions which include County of

Kauai representatives, stakeholders in the community (including surfers), the developer and the landowner, which will continue through the development approval process.

Fishpond Improvement. Various sections of the EIS describe how the condition of the 6.5-acre inland fishpond, which is located in the central portion of the property, has deteriorated over the last few decades with accumulation of silt, and coverage of open water with vegetation. Various methods to clear the fishpond of silt and vegetation have been considered, including the use of different pieces of equipment and/or hand clearing. Specific equipment has not been identified to date. However, whatever method is used, when silt and vegetation is removed, it would need to be dewatered before disposal. Dewatering would occur adjacent to the fishpond. Spoil material would then be removed from the property and disposed on mauka agricultural lands owned by Gay and Robinson, Inc. In addition, care would need to be taken to ensure that the walls of the fishpond are not damaged. Choice of final methods and equipment would involve discussions with:

- U.S. Fish and Wildlife Service;
- U.S. Army Corps of Engineers;
- State Department of Land and Natural Resources;
- County of Kauai (Planning Department, Department of Public Works);
- The landowners; and
- The developer (Destination Villages Kauai, LLC)

1.6 Compatibility with Land Use Plans and Policies

Chapter 3 includes a discussion of the project's compatibility with existing government plans, policies, and objectives. Because of the competing and conflicting nature of many of these plans, policies and objectives, the project supports many and is inconsistent with others. Generally, the proposed project is consistent with applicable State objectives for recreation, tourism, and the economy, and State and County objectives and policies for management of the coastal zone. The project is currently inconsistent with State Land Use designations, and County General Plan and zoning regulations, and as a result, must comply with the permit requirements, identified in Section 1.7, below.

1.7 Necessary Permits and Approvals

Development of the property as proposed will require the following permits and approvals from various County, State, and Federal agencies. A summary of possible required approvals is provided below. No approvals have been obtained for the project at this time.

<i>Approval Required</i>	<i>Authority</i>	<i>Status</i>
<i>Federal Government</i>		
Department of the Army Permit (for bridge crossings of Mahaikona Stream)	U.S. Army Corps of Engineers	<u>Application to be submitted after approval of SMP</u>
Department of the Army Permit (for clearing silt and vegetation from fishpond)	U.S. Army Corps of Engineers	<u>Application to be submitted after approval of SMP</u>
<i>State of Hawaii</i>		
State Land Use District Boundary Amendment	State Land Use Commission	<u>Application to be submitted 3/2000</u>
National Pollutant Discharge Elimination System Permit (for clearing over 5 acres)	Department of Health	
Certification of a New Drinking Water Source	Department of Health	<u>Application to be submitted after approval of SMP</u>
Well Construction Permit	State Commission on Water Resource Management (DLNR)	<u>Application to be submitted after approval of SMP</u>
Pump Installation Permit	State Commission on Water Resource Management (DLNR)	<u>Application to be submitted after approval of SMP</u>
Permit to Perform Work Upon a State Highway (for improvements to Kaunualii Highway)	Department of Transportation	<u>Application to be submitted after approval of SMP</u>
Stream Alteration Permit (for bridge crossings of Mahaikona Stream)	Department of Land and Natural Resources	<u>Application to be submitted after approval of SMP</u>
<i>County of Kauai</i>		
General Plan Amendment	Planning Commission, County Council, Mayor	<u>Submitted 1/2000</u>
Zoning Amendment	Planning Commission, County Council, Mayor	<u>Submitted 2/1000</u>
Special Management Area Use Permit	Planning Commission	<u>To submit 7/2000</u>
Project Development Use Permit	Planning Commission	<u>To submit 7/2000</u>
Class IV Zoning Permit	Planning Commission	<u>To submit 7/2000</u>
Grading, Grubbing and Stockpiling Permit	Department of Public Works	<u>To submit 7/2000</u>
Building Permit	Department of Public Works	<u>To submit after approval of SMP</u>

1.8 Statement of Purpose and Need for Action

Over a period of the last several decades, the ability of the Robinson family to provide the resources necessary for maintenance of the family dwelling located at Kapalawai, the fishpond, and the remainder of the Kapalawai property has decreased. As a consequence, the condition of these family resources, which are important historic resources for the family and for the rest of Hawaii, have deteriorated. The development of the proposed project will provide a steward for the property within a project concept that includes the renovation, restoration, and preservation of the former family residence as a museum, in addition to

administrative spaces, and the improvement of the fishpond. The project is necessary as a vehicle to preserve these treasures. Renovation and restoration of the residence alone will cost approximately \$1,000,000.

As a beneficial by-product of development, the project will also provide welcome economic stimulus for West Kauai and the island economy as a whole. The Kapalawai Resort will add approximately 200 direct operational jobs to the West Kauai economy. In addition approximately 120 indirect and induced jobs will be created from the economic activity generated by Kapalawai. The effect of the indirect and induced jobs will be felt throughout the State, but will be most felt on Kauai. While the unemployment rate for Kauai has fallen in the last two years from about 10.2 percent to 7.1 percent, it still remains above the State-wide average of 5.6 percent, and the average for Honolulu which is 5.6 percent (State Department of Labor & Industrial Relations, 1999).

1.9 Purpose and Need for this Environmental Impact Statement

The purpose of this draft environmental impact statement (EIS) is to describe and assess a proposal for the development of a resort and accessory facilities to the resort. The EIS is a disclosure document which provides information on all known or potential effects that the proposed action may have on the environment, and the economic and social welfare of the community. It includes a discussion of the potential impacts of the proposed project, both beneficial and adverse, and proposes measures to either avoid or minimize adverse impacts to the environment.

The proposed action is subject to the provisions of Chapter 343, Hawaii Revised Statutes (HRS), because it requires a General Plan Amendment from the County of Kauai. By letter dated July 12, 1999. The County of Kauai Planning Department notified the Office of Environmental Quality Control (OEQC) that it had determined the project may have a significant effect on the environment and that an EIS was required. Notice of this determination was published in the July 23, 1999 edition of the *Environmental Notice*, commencing a 30-day public review period that ended on August 23, 1999. Chapter 12 contains a listing of agencies, organizations, and individuals consulted during the preparation of the Draft EIS. The chapter also contains reproduction of written comments on the EIS Preparation Notice (EISPN) and the applicant's responses to those comments.

1.10 Unavoidable Adverse Effects

The development of the Kapalawai Resort will increase the number of vehicles using the roadway network of the region. Mitigation measures can be employed to reduce impacts associated with turning movements into and out of the project site. However, traffic volume in the region will increase.

Similarly, additional solid waste material will be added to the Kekaha Landfill. The overall percentage of material contributed to the landfill by the proposed resort will be quite small and will not significantly affect the useful life of the landfill.

In addition, the resort will increase energy demands placed on Kauai Electric Company.



2

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 Location and Ownership

The 470 153,696-acre Kapalawai property is located in the *ahupua`a* of Makaweli, in the judicial district of Waimea, on the west side of the island of Kauai, Hawaii. The property is located on a gently sloped piece of land between the shoreline and Kaumualii Highway, the respective southern and northern boundaries of the project site. Aakukui Stream marks the eastern boundary of the property, while agricultural lands owned by Robinson Family Partners and leased to Pioneer Hi-Bred International, Inc., are located to the west. The town of Waimea (population: 1,840) is located about 1/2 mile to the northwest. The town of Hanapepe (population: 1,400) is located about 2 miles to the southeast (Figure 1). The largest town on the West Side of Kauai is Kekaha (population: 3,500, located about 4 miles northwest of the project site.

The economy and community life of the West Side region of Kauai has long been influenced by agriculture, with sugar being the most important crop. Plantation employment has been declining over the years, and the recent closure of the Kekaha Sugar Mill and slippage of sugar prices continue to threaten the economic stability of the region. The Pacific Missile Range Facility at Barking Sands (about nine miles northwest of the project site) is the region's largest employer.

The project site, identified by Tax Map Key (4) 1-7-05:1 (Figure 2), is owned in portion by three entities: (1) Gay & Robinson, Inc.; (2) Robinson Family Partners (RFP); and, Bruce Robinson. Lease of the property is held by Destination Villages Kauai, LLC (DVK), represented by its President, Lewis Geysler.

2.2 Existing Uses

The now vacant former residence of the Robinson Family is the primary structure located on the property. Other structures accessory to the main house still on the property include a dwelling (former guest house), a carriage house, and an office building now used by Robinson Family Partners. In addition, eight plantation-era homes are found in the northwest corner of the property, between the entry drive and the Family residence. These homes were constructed for employees of the Family. Currently, four of the plantation-era dwellings are still occupied. These buildings will be retained, and no families will be evicted as a result of the construction of the proposed resort.

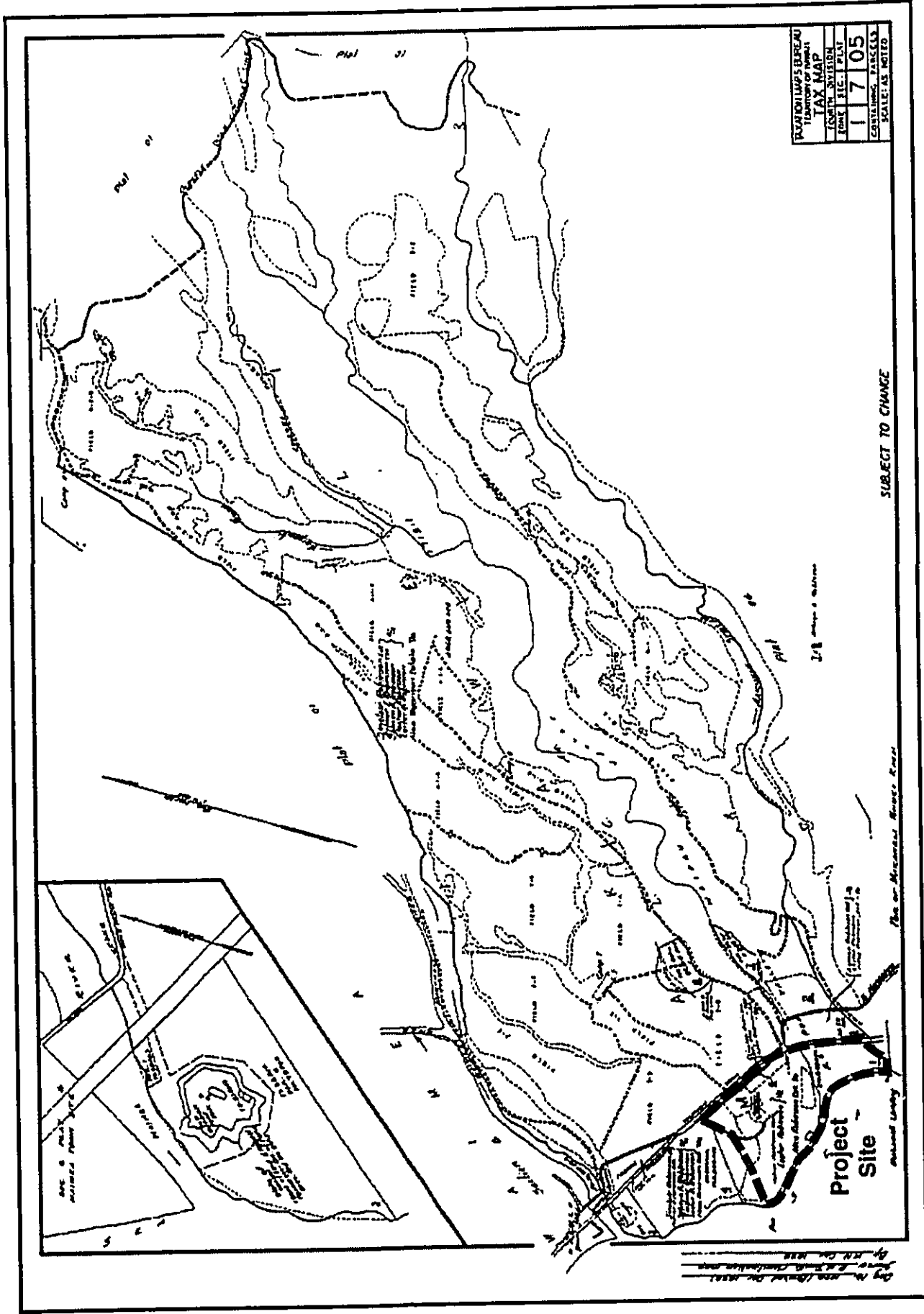


Figure 2

Tax Map Key

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Prepared for: Destination Villages Kauai, LLC
Prepared by: • Mason Architects • Helber Hastert & Fee, Planners

Outside the compound of the main house and the accessory structures, the property was, until recently, used for the grazing of bulls.

2.3 Project Description

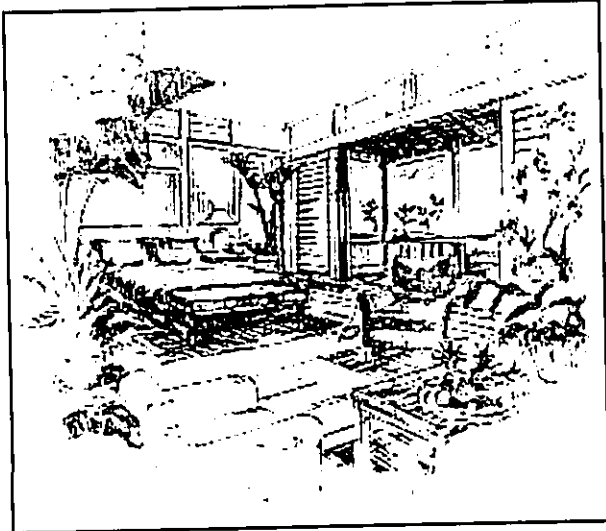
The proposed resort includes 250 visitor units (or cottages) that are dispersed throughout the project site, resulting in an overall density of 1.6 units per acre. Approximately 164 of the units will be free-standing and 86 units will be constructed as 43 duplex units. Average separation distance between units will be about 40 feet. Each of the single-story cottages will be about 400 square feet in size, with a 200 square foot deck. No cooking facilities, air conditioners, phones, or televisions will be provided for the units. A preliminary floor plan and sketch of typical cottages are shown in Figure 3.

A main pedestrian arterial, which will meet Americans with Disabilities Act (ADA) requirements, will connect cottages with adjacent parking areas and activity centers. The walkways will function as the principle means of circulation within the property for resort guests. Vehicular access will be restricted to registration, parking areas, and restaurants.

One of the focal points for the proposed resort will be the former Robinson family residence. The building footprint for the residence is approximately 17,000 square feet, and includes an interior courtyard and wrap-around lanais on the exterior of the building and facing the interior courtyard. The original drawings for the residence (completed in 1897) included the following rooms and floor area described in Table 1.

A 1,200 square foot wing was later added to the eastern side of the house and included three bedrooms and one bathroom for a total floor area of about 6,791 square feet.

The general plan for the residence is to develop the main house and attached structures as a greeting space and as a museum, administration, and meeting room area. Some renovations, including demolition of interior walls, are proposed on the interior to provide three meeting rooms, a bar, and men's and women's restrooms. Part of a wall that had been moved out to the lanai edge on the east side of the building will be returned to its original location. The library, sitting room, dining room, pantry, china room, and linen room, as well as the original



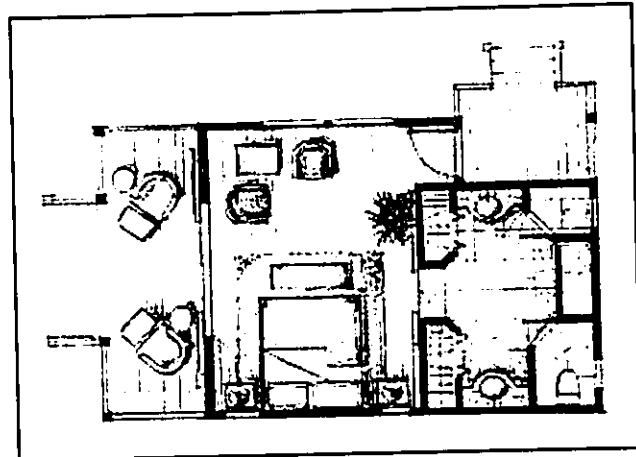
Interior of typical cottage looking toward ocean.



Another view of a cottage showing relationship between the built environment and generous landscaping.



Exterior of typical cottage amongst existing mature trees.



Floor plan for a typical cottage.

Proposed Visitor Cottage

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Prepared for: Destination Villages Kauai, LLC
Prepared by: • Mason Architects • Helber Hastert & Fee, Planners

Figure 3

Table 1
Original Floor Plan for Robinson Family Dwelling

Room	Floor Area (square feet)
Kitchen	224
Pantry (3)	334
Bakery	140
Milk Room	120
Store Room	130
School Room	216
Guest Chamber (5)	858
Linen	180
China Room	180
Dining Room	432
Sitting Room	648
Library	270
Sewing Room	190
Dressing Room (2)	342
Bedroom (4)	855
Bathroom (5)	400
Locker Room	72
Total (excluding lanais)	5,591

portion of the kitchen building will be used in their current layout as museum spaces, and displays of furniture and other items currently in the house.

It is intended that guests will enter the property via the existing driveway off Kaunualii Highway (which will be for entry purposes only). The driveway extends for about 2,000 feet, and is bordered by low (3-foot) walls on either side. Night-blooming cereus (Hylocereus undatus) and cat's claw climber (Macfadyena unguis-cati) are abundant along the wall and create a memorable drive into the property. Guests will arrive near the current Robinson Family Partners office building, which is covered by a dense canopy of monkey pod trees (Samanea saman). Guests will be greeted personally by resort staff, assisted with registration, and escorted to their cottage.

Amenities provided at the resort will include:

- Two restaurants;
- Snackbar;
- Museum (in the former family residence);
- Bar/Lounge (in the former family residence);
- Three swimming pools;

- Fitness center/beach club;
- Sport courts (tennis, basketball, volleyball, badminton); and
- Amphitheater

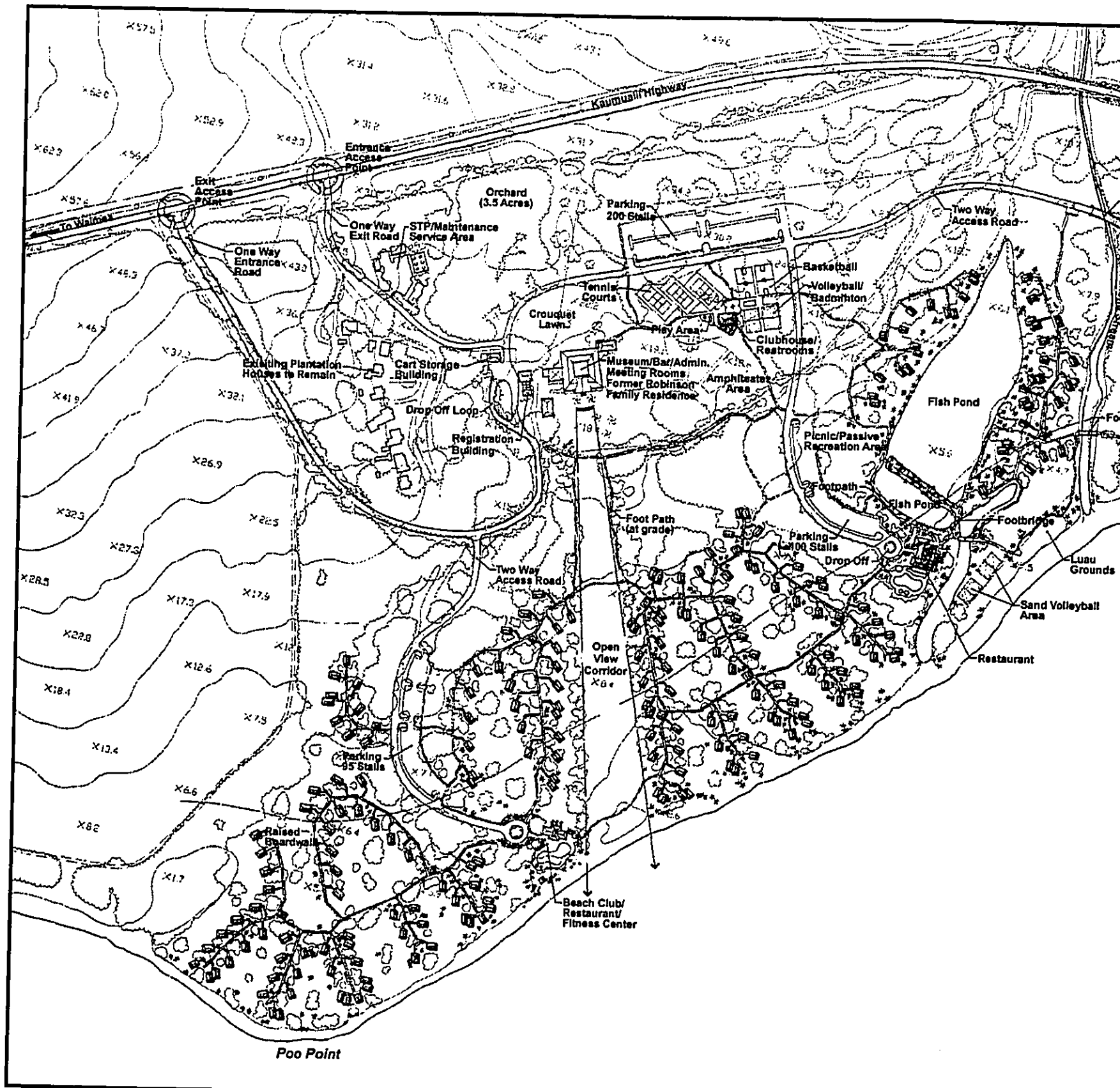
A preliminary site plan for the resort is shown in Figure 4.

A wastewater treatment plant is proposed to handle all wastewater generated by the project, and will be located on the northern portion of the property, between the main house and Kaumualii Highway. The wastewater treatment plant is proposed to be located with the maintenance building. Wastewater will be treated and the reclaimed water will be used for irrigation in the resort (see Chapter 6).

In addition, a second focal point for the project will be the preservation of the 6.5-acre fishpond located in the central portion of the property. Silt and noxious vegetation will be removed from the pond, re-establishing the open water character of the pond, as observed in an aerial photo of the property taken in 1953 (Figure 5).

2.4 Cost and Phasing

The estimated construction cost for the Kapalawai Resort is \pm \$33 million. Once all permits are obtained (projected for January 2001), construction is anticipated to take about 12-15 months. The entire development will be built in one phase.



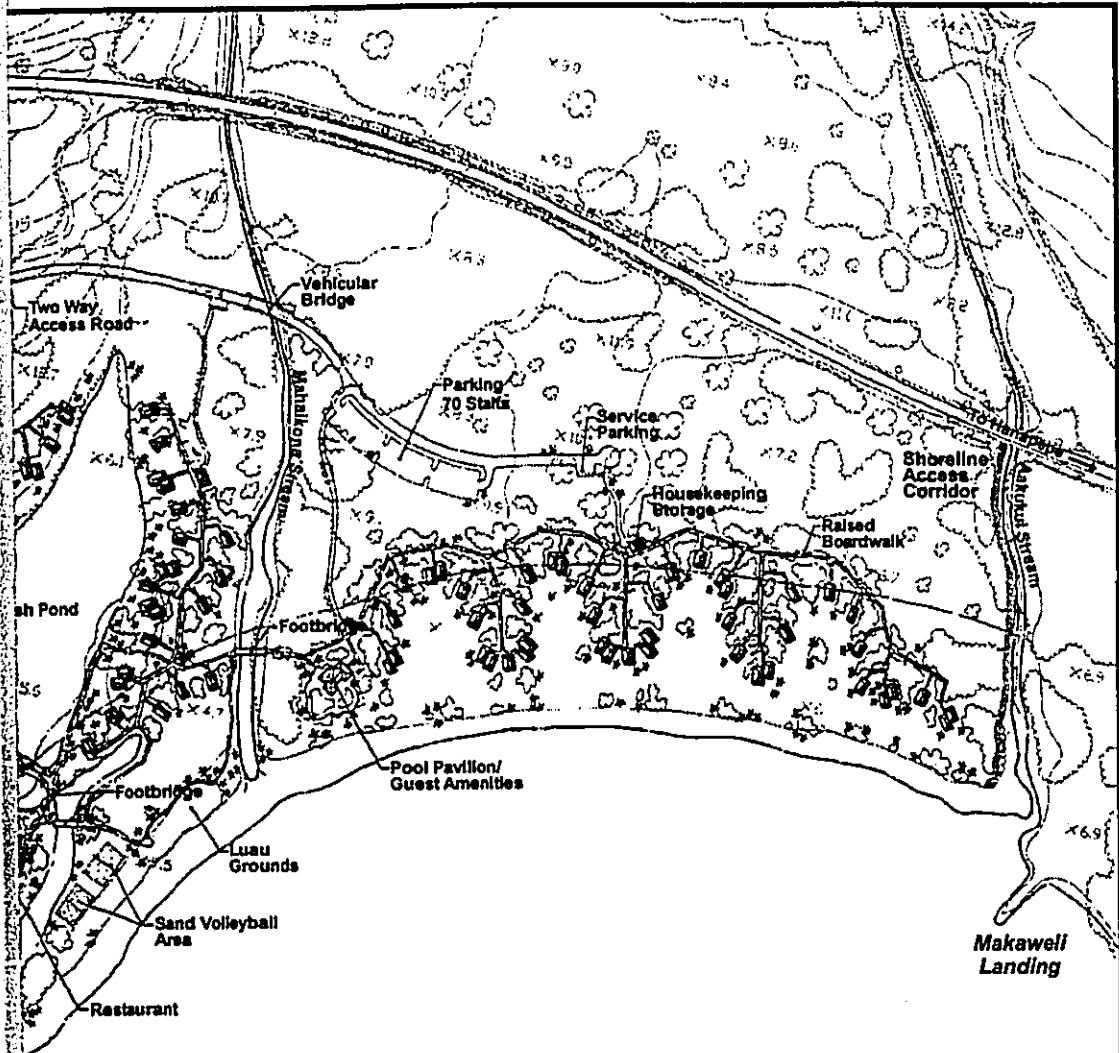


Figure 4
Preliminary Site Plan

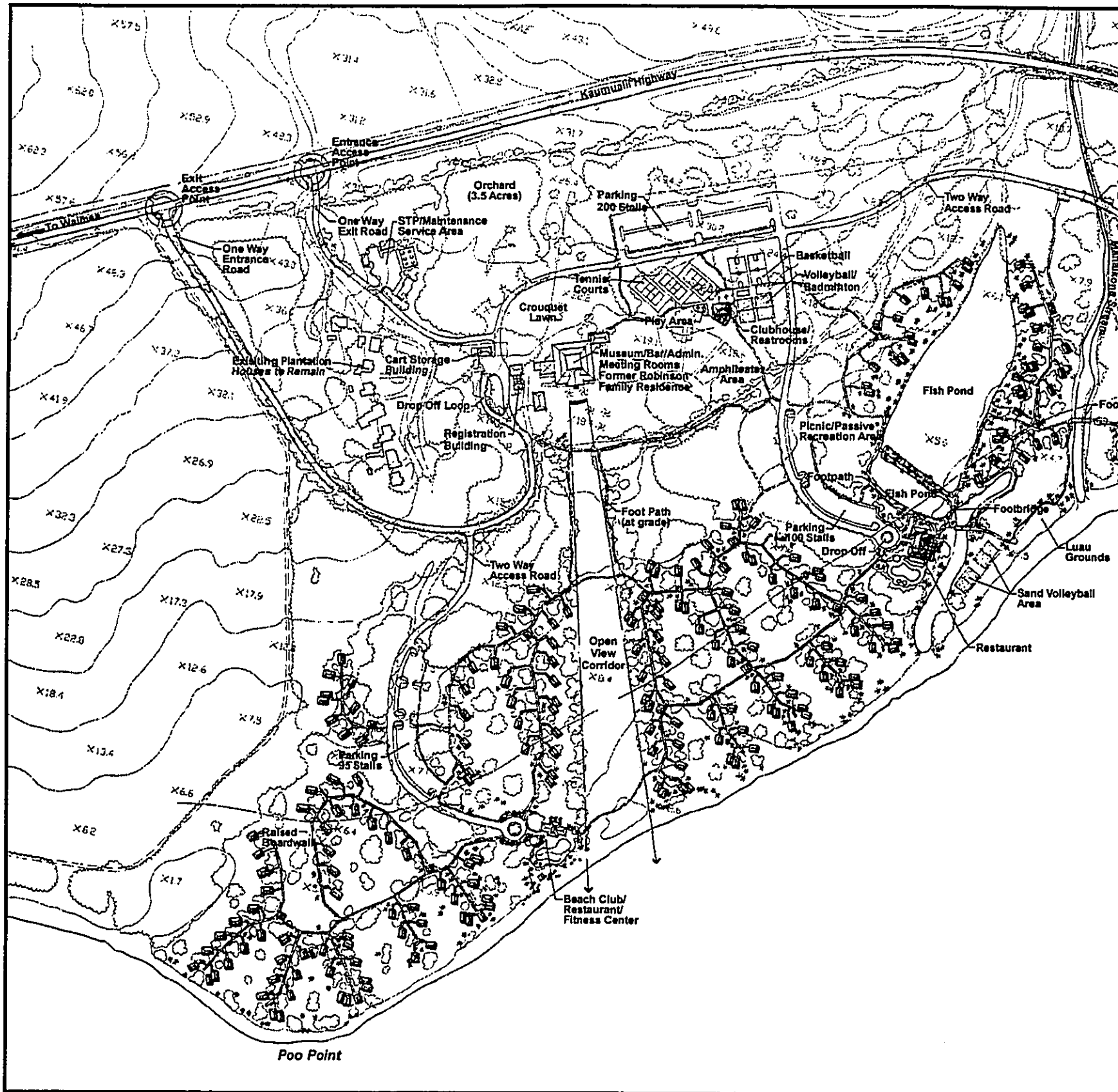
KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii



Prepared by Helber Hastert & Fee, Planners

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



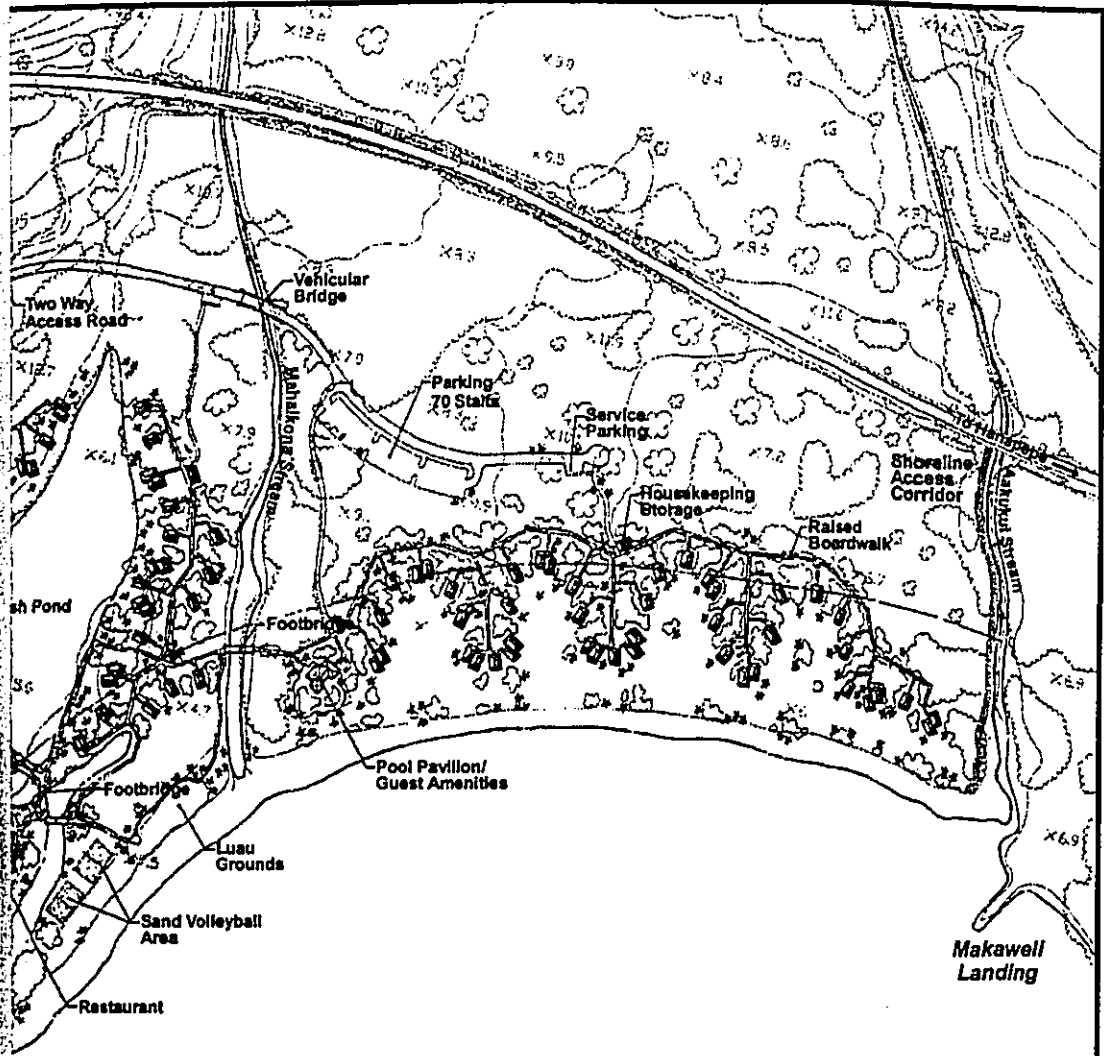
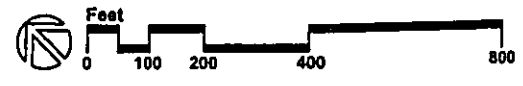


Figure 4
 Preliminary Site Plan

KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii



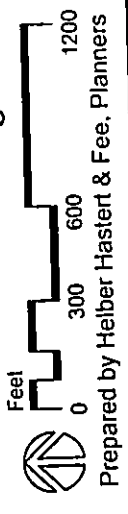
Prepared by Helber Hastert & Fee, Planners



1953 Aerial Photo

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 5





3

RELATIONSHIP OF
THE PROPOSED PROJECT
TO EXISTING PUBLIC PLANS,
POLICIES AND CONTROLS

3.0 RELATIONSHIP OF THE PROPOSED PROJECT TO EXISTING PUBLIC PLANS, POLICIES AND CONTROLS

3.1 State of Hawaii

3.1.1 Hawaii State Plan

The Hawaii State Plan (Chapter 226, HRS, as amended) establishes a set of guidelines for the statewide planning system, and provides the overall theme, goals, objectives, policies and priority guidelines. The following describes the purpose of the State Plan.

"...[it] shall serve as a guide for the future long-range development of the State; identify the goals, objectives, policies and priorities for the State; provide a basis for determining priorities and human resources, land, energy, water and other resources; improve coordination of federal, state and county plans, policies, programs, projects and regulatory activities; and to establish a system for plan formulation and program coordination to provide for an integration of all major state and county activities" (Chapter 226-1: Findings and Purpose, HRS).

The goals, objectives, policies, and guidelines of the Hawaii State Plan are, on occasion, in conflict with one another. As a result, the proposed project supports some of the goals, while it is inconsistent with others. The following discussion analyzes the project's impacts with respect to relevant State Plan goals, objectives, policies and priority guidelines:

Section 226-6 Objective and policies for the economy--in general.

Section 226-6(b)(1) Expand Hawaii's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.

Section 226-6(b)(2) Promote Hawaii as an attractive market for environmentally and socially sound investment activities that benefit Hawaii's people.

Section 226-6(b)(3) Seek broader outlets for new or expanded Hawaii business investments.

Section 226-6(b)(4) Expand existing markets and penetrate new markets for Hawaii's products and services.

Section 226-6(b)(10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected economic problems.

Discussion: The proposed resort represents a type of visitor industry product that is unique in Hawaii. The low-density and low-impact project (250 units on ~~470~~ 153.696 acres) emphasizes the historic nature of the project site and will encourage guests to leave the property to experience other cultural and recreational experiences on Kauai in general, and Kauai's West side in particular.

The resort will attract guests who presently comprise a segment of the travel market that is not highly recruited in Hawaii, the eco-tourist. Eco-tourism is a term that can be applied to a wide variety of travelers, including adventure-travel, cultural-travel, agricultural tourism, etc. These travelers are more interested in understanding the intrinsic values that define communities (such as: history, music, art, food, etc.), rather than being pre-occupied solely with the physical attributes of an area. Traditionally, tourism in Hawaii has relied heavily on its natural beauty.

In addition to broadening the market base for visitors to Hawaii, the demographics of this type of tourist show them to be more educated, more affluent, and more environmentally aware.

In addition, the operating philosophy of the developer is to create business opportunities for other entrepreneurs who are interested in providing services to the resort. Frequently, these services are provided by the resort. Allowing local companies to provide these services allows more profits to remain in the local community.

Section 226-11 Objective and Policies for the physical environment--land-based, shoreline, and marine resources.

Section 226-11(b)(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.

Section 226-11(b)(2) Ensure compatibility between land-based and water based activities and natural resources and ecological systems.

Section 226-11(b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

Section 226-11(b)(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

Section 226-11(b)(8) Pursue compatible relationships among activities, facilities and natural resources.

Discussion: In addition to a corporate and operational philosophy that is based on resource conservation and recycling, the proposed resort is also dedicated to principles of environmental and ecological protection and enhancement. An existing historic fishpond will be protected and improved. The grounds of the property, which have deteriorated and been neglected for decades, will be managed once again. To the greatest extent possible, the overwhelming majority of the project site will be left in open space and natural landscaping. The emphasis on individual cottages will allow more landscaping to effectively create a natural feel to the project. The restriction of roadways and the development of a pedestrian network will also limit environmental impact and foster pedestrian activities within the property.

Section 226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources.

Section 226-12(b)(1) Promote the preservation and restoration of significant natural and historic resources.

Section 226-12(b)(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

Section 226-12(b)(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Discussion: As discussed above, the preservation and enhancement of an existing historic fishpond on the property is an integral element of the overall project. In addition to the preservation of the fishpond, other historic resources play an important role in the overall character of the project.

The master plan for the resort includes retaining and restoring the former Robinson family residence, renovating its interior and exterior, and using a

significant portion of the building as a museum dedicated to the history of the property and the Robinson Family.

The overall design of the resort will enhance the aesthetic enjoyment of the property and will not interrupt views of the ocean. The entire site is currently shielded from view along Kaumualii Highway by existing vegetation. Thus, due to the low-rise nature of the project, future development of the site will not be visible from the highway.

Section 226-13 Objectives and policies for the physical environment—land, air, and water quality.

Section 226-13(b)(2) Promote the proper management of Hawaii's land and water resources.

Section 226-13(b)(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.

Section 226-13(b)(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.

Section 226-13(b)(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures

Discussion: The low density and low profile of the project respects the natural aesthetics of the property, the region, and the island. This is evident with the emphasis the project design places on pedestrian experience. The combination of low density and pedestrian experience allows for the retention of large trees. In terms of coastal views, the property is not presently visible from Kaumualii Highway because of dense vegetation fronting the highway.

Environmental sensitivity is a pervasive axiom for the design and operation of the proposed resort. Recycling wastewater, clearing the fishpond and using some of its spring water for irrigation, limiting paved surfaces, and returning to active landscape management and irrigation, are intended to restore sensitive, on-going land stewardship to the property.

The built environment will recognize constraints of the natural environment with adherence to regulations pertaining to flood hazards.

The use of boardwalks and other walkways will enhance the preservation of vegetation on the site, minimizing the trampling of vegetation on pathways, or the construction of impervious surfaces. Similarly, automobiles will be parked after registration, and the main mode of on-site transport by guests will be pedestrian.

Section 226-15 Objectives and policies for facility systems—solid and liquid wastes

226-15(b)(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.

Discussion: As discussed in sections above, re-use and recycling are a fundamental corporate philosophy and educational objective of the applicant and will be incorporated into project design and management. Recycling wastewater, composting green waste, and crushing and recycling glass containers are a few of the programs employing a conservation ethic.

Section 226-16 Objective and policies for facility systems—water

226-16(b)(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.

Discussion: Wastewater from resort facilities will be collected, treated using an on-site wastewater treatment plant, and reclaimed as irrigation water elsewhere on the property.

3.1.2 State Functional Plans

The Hawaii State Plan directs the appropriate State agencies to prepare functional plans for their respective program areas, including: agriculture, transportation, conservation lands, housing, tourism, historic preservation, energy, recreation, education, higher education, and health. The State Functional Plans serve as the primary implementing vehicle for the goals, objectives and policies of the Hawaii State Plan.

The plans set forth "...the policies, statewide guidelines, and priorities within a specific field of activity, when such activity or program is proposed, administered, or funded by an agency of the State" (Section 226-2 [10] Hawaii Revised Statute). Each functional plan contains objectives to be achieved and policies to be pursued within the specified areas. "...Such policies shall address major programs and the locations of major facilities" (Section 226-57 (b) HRS).

The State Functional Plans are approved by the Governor. The project generally supports the objectives and policies of the following State Functional Plans:

State Recreation Functional Plan

The Department of Land and Natural Resources coordinated the preparation of this functional plan.

Issue Area: Public Access to the Shoreline and Upland Recreation Areas

Objective III-A: Prevent the loss of access to shoreline and upland recreation areas due to new developments.

Policy III-A(1): Require land use permit applications to fully address the impact on trails and public access.

Issue Area: Resource Conservation and Management

Policy IV-B(3): Protect surfing sites.

Discussion: Presently, public access to the shoreline is allowed near Aakukui Stream, on the Hanapepe side of the property. Currently, beachgoers park alongside Kaunualii Highway and walk down a path through a pasture to reach the ocean. The path ends in the vicinity of the former Makaweli Landing. The primary interest for users of this path is reaching the well-known surf break, "Pakalas" (also known as "Infinities") on the south side of the landing. Fishermen and sunbathers also use this path. This access will not be unreasonably interrupted by implementation of the proposed project.

State Tourism Functional Plan

Preparation of this functional plan was coordinated by the Department of Business, Economic Development and Tourism.

Issue Area: Growth

Policy I.A.4: Ensure that the growth of the visitor industry assists in the overall State goal of expansion and diversification of the economy.

Policy I.A.5: Ensure that the benefits of tourism development are spread evenly throughout the State, to the extent desired by the counties, by making special efforts to distribute growth to the Neighbor Islands.

Issue area: Physical Development

Policy II.A.2: Enhance tourism product and encourage continued development of a diverse range of tourism products.

Policy II.A.3: Facilitate the reasonable distribution of financial responsibilities between government and private parties to fund tourism-related capital improvements and related infrastructure requirements.

Discussion: As discussed relating to the Hawaii State Plan (Section 3.1.1), above, the proposed resort will target a previously under-marketed segment of Hawaii's visitor industry. This will broaden the economic base of the industry. The product itself will be unique because of the emphasis on the historical, social, and environmental aspects of the property. This includes the restoration and improvement of structural elements on-site (former Robinson family residence and the fishpond) and the integration of these elements into the fabric of the resort, including an on-site museum.

In terms of infrastructure requirements, the developer will assume complete responsibility for funding and construction of on- and off-site infrastructural improvements, including potable/nonpotable water and wastewater.

Issue area: Environmental Resources and Cultural Heritage

Objective III.A: Enhancement of respect and regard for the fragile resources which comprise Hawaii's natural and cultural environment. Increased preservation and maintenance efforts.

Policy III.A.2: Assist in preserving, perpetuating, and interpreting cultural, historic and archaeological resources.

Discussion: A fundamental premise for the development of the resort is the preservation of important historic resources and their integration into the overall plan for Kapalawai. The former Robinson family house, its accessory buildings, and the fishpond form the basic core of the project. Architectural themes, site planning, and visitor experience will all be enhanced by the preservation of these important historic resources, including the use of a significant portion of the house as a museum.

State Agriculture Functional Plan

Preparation of this functional plan was coordinated by the Department of Agriculture.

Issue area: Land and Water

Policy H(1): Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution

Discussion: Language in the State Constitution relative to agricultural lands, directs the State to "conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable kinds."

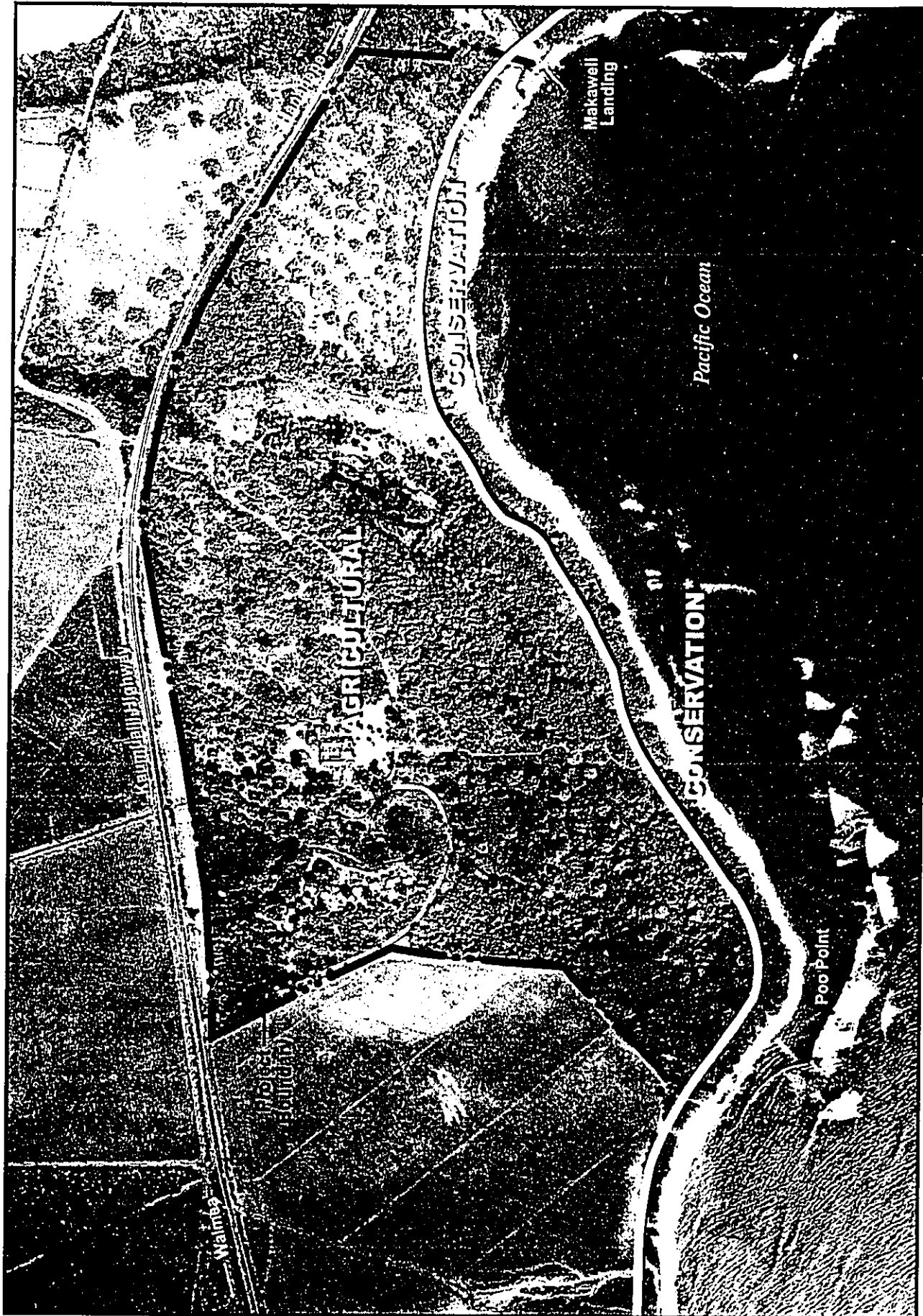
The constitution makes it clear that important agricultural lands shall not be reclassified without meeting appropriate standards (established by the State Land Use Commission) and a two-thirds vote of the Commission.

As discussed in Section 4.4, the majority of the property is not highly valued for its agricultural potential, and has never been used for commercial agricultural production. It has mainly been used as pasturage for livestock, and there is an ample supply of more highly suitable land elsewhere in the region.

The conversion of this property to a low-density resort will not compromise the State's ability to ensure the overall health of Hawaii's agricultural sector. The property has served as a primary residence for the Robinson family beginning in 1897.

3.1.3 State Land Use Law

All lands in the State of Hawai'i have been classified in one of four land use districts by the State Land Use Commission, pursuant to Chapter 205, Hawaii Revised Statutes (HRS). The four land use districts are: (1) Conservation; (2) Agriculture; (3) Urban; and (4) Rural. The area comprising the project site lies mostly within the State Agricultural Land Use District, with a narrow strip of land mauka of the shoreline falling within the State Conservation Land Use District. (Figure 6). Resort uses are not permitted in either the Agricultural or Conservation Districts. It is the intent of the applicant to seek a State Land Use District Boundary amendment to "urban" for that portion of the property within the State Agricultural District (153,696 acres).

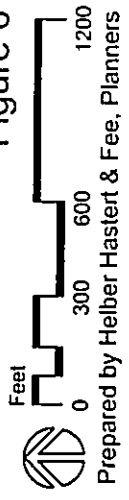


State Land Use Designations

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

* Boundary between conservation and Agricultural Districts is set at an average of 100 feet mauka of certified shoreline, per boundary interpretation of 3-22-2000.

Figure 6



Prepared by Helber Hastert & Fee, Planners

3.1.4 Coastal Zone Management

In an effort by the State of Hawaii to preserve and protect the natural resources of the coastal zone, special controls on development along the shoreline have been implemented, as contained in Chapter 205A, Hawaii Revised Statutes, (HRS), as amended (hereafter referred to as Chapter 205A). This law defines the Coastal Zone Management Area to be all areas of the State of Hawaii, except forest reserve areas. As such, the project site lies within the Coastal Zone. In addition, Chapter 205A contains the general objectives and policies upon which all counties within the State of Hawaii, (including the County of Kauai), have structured more specific legislation which has created Special Management Areas (SMAs) for each county (the specific provisions of the county Special Management Area are discussed in Section 3.2.5). The requirements of Chapter 205A as related to the proposed project, are discussed below.

Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

1. *Protect coastal resources uniquely suited for recreational opportunities that cannot be provided in other areas.*
2. *Require 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.*
3. *Provide and manage adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.*
4. *Provide an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.*
5. *Ensure public recreational use 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.*

6. *Adopt water quality standards and regulate point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.*
7. *Develop new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, artificial reefs for surfing and fishing.*
8. *Encourage 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, county planning commissions, and credit such dedication against the requirements of park dedication rules and regulations.*

Discussion: The shoreline fronting the project site is used primarily by fishermen and strollers. There is also a popular surfing break beyond the southern boundary of the property, although entry into the water to paddle to this break occurs further down the beach. Access for fishermen, surfers, or others who wish to reach the beach is readily available from off Kaunualii Highway down a path paralleling Aakukui Stream. It takes less than 5 minutes to walk to the shoreline from Kaunualii Highway. Access to the shoreline will not be interrupted by the proposed project. In addition, public access to the shoreline will also be encouraged and promoted with the provision of public spaces in on-site parking areas.

Historic 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:

1. *Identify and analyze significant archaeological resources.*
2. *Maximize information retention through preservation of remains and artifacts or salvage operations.*
3. *Support state goals for protection, restoration, interpretation, and display of historic resources.*

Discussion: An archaeological inventory survey was conducted for the project site by Cultural Surveys Hawaii. The inventory survey identified five sites, including: the fishpond; a Portugese oven; the former Robinson family house complex; a series of rock walls and a terrace; and a rock platform. Each of these sites will be preserved. While the entire residence will be renovated, a portion of the building will be dedicated to the creation of a museum, documenting the history and lifestyle of the Robinson family, who comprise such an important part of the history of Kauai. In addition, the fishpond will be cleaned of silt and vegetation in an attempt to restore its former condition. The Portugese oven will also be preserved in place.

Scenic and Open Space Resources

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

Policies:

1. *Identify valued scenic resources in the coastal zone management area.*
2. *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.*
3. *Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources.*
4. *Encourage those developments which are not coastal dependent to locate in inland areas.*

Discussion: Views of the interior of the project site are obstructed by dense trees and vegetation along the makai side of Kaumualii Highway. There are no views of the ocean along the entire length of the project site fronting the highway. Buildings on the project site would also be obstructed from view while travelling on the highway due to existing vegetation.

Although the proposed use is not coastal dependent, many other successful resorts on Kauai, and throughout the State are typically located on ocean front parcels.

Coastal Ecosystems

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

Policies:

1. *Improve the technical basis for natural resource management.*
2. *Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance.*
3. *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.*
4. *Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.*

Discussion: Planning for the resort at Kapalawai has included consideration of impacts to aquatic habitats on-site and marine habitats off-site. A primary goal for the property is to improve the physical condition of the fishpond by removing plants and silt which are threatening to completely fill the fishpond. In addition to improving the water quality of the fishpond, clearing vegetation and silt will also create desirable habitat for endangered waterbirds. In addition, maintenance of the Mahaikona and Aakukui streams will likewise improve the open water habitats of these watercourses and increase their capacities to handle stormwater runoff.

Design of on-site drainage facilities is based on minimizing additional sediment load to nearshore receiving waters. These facilities include the grass-lined channel to be developed within an existing man-made drainage ditch. The new channel will end near the ocean emptying into a detention area that will settle sediments prior to overwash during large storm events.

Economic Uses

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

Policies:

1. *Concentrate coastal dependent development in appropriate areas.*
2. *Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities, and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area.*
3. *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:*
 - *use of presently designated locations is not feasible*
 - *adverse environmental effects are minimized*
 - *the development is important to the State's economy*

Discussion: Generally speaking, the proposed resort is not coastal dependent, and the objective and policies in this area are not applicable to this type of development.

Coastal Hazards

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

Policies:

1. *Develop and communicate adequate information on storm wave, tsunami, flood, erosion, and subsidence, and point and non-point source pollution hazards.*
2. *Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point source pollution hazards.*
3. *Ensure that developments comply with requirements of the Federal Flood Insurance Program.*

Prevent coastal flooding from inland projects.

5. *Develop a coastal point and non-point source pollution control program.*

Discussion: Flood Insurance Rate Maps (FIRM) show that portions of the project site are subject to inundation, in "AE" zones (see Section 4.8). All affected structures will be elevated above the base flood height.

Managing Development

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

Policies:

1. *Use, implement and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development.*
2. *Facilitate timely processing of application for development permits and resolve overlapping or conflicting permit requirements.*
3. *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.*

Discussion: The application for a Special Management Area Use Permit (SMP), the preparation of this EIS, including technical appendices, and the processing of the permit request, including public hearings, is consistent with the objective and policies.

Public Participation

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

Policies:

1. *Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program.*
2. *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-related issues, developments, and government activities.

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

Discussion: The objective and policies are geared primarily for agencies with jurisdiction for enforcing coastal zone management rules and regulations.

Beach Protection

Objective: Protect beaches for public use and recreation.

Policies:

1. *Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion.*
2. *Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at sites and do not interfere with existing recreational and waterline activities.*
3. *Minimize the construction of public erosion-protection structures seaward of the shoreline.*

Discussion: All structures at the resort will be located a minimum of 100 feet mauka of the certified shoreline. The shoreline fronting the project site appears stable and is protected with healthy vegetation. Thus, no erosion-protection structures are proposed as part of the development program.

Marine Resources

Objective: Implement the State's ocean resources management plan.

Policies:

1. *Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources.*
2. *Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.*

3. *Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency.*
4. *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.*
5. *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.*
6. *Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Discussion: The most basic aspects of the operating philosophy for the resort are rooted in environmental sensitivity and stewardship of resources. This includes recycling, education, protection of endangered and threatened species, and improvement of wildlife habitats.

3.2 County of Kauai

3.2.1 Special Management Area

The County of Kauai, similar to other counties in Hawaii, has adopted: (1) boundaries which identify the Special Management Area (SMA); and (2) rules and regulations which are consistent with Chapter 205A, HRS that control development within the SMA. A portion of the project site lies within the SMA (Figure 7). The SMA Rules and Regulations of the County of Kauai include guidelines that are used by the County Planning Commission for the review of developments proposed within the SMA. These review guidelines, and the relationship of the proposed resort to them, are discussed below.

All development in the special management area shall be subject to reasonable terms and conditions set by the Authority to ensure that:

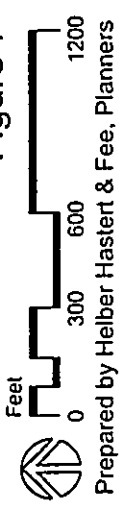
- *Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas and natural reserves is provided to the extent consistent with sound conservation principles.*
- *Adequate and properly located public recreation areas and wildlife preserves are reserved.*



Special Management Area Use Boundary

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 7



- *Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon special management area resources.*
- *Alterations to existing land forms and vegetation except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of earthquake.*

Discussion: Existing means of pedestrian access to the shoreline near Aakukui stream will continue. Additional shoreline access will be provided with designated public parking spaces in the main parking areas of the resort.

Wastewater treatment will be provided by an on-site plant. Reclaimed water will then be recycled on-site as irrigation water. There will be no effluent discharge to the ocean or on-site streams. In regard to solid waste, the resort will implement an aggressive recycling program, including: glass; plastic; paper; and, green waste. The balance of new-recyclable solid waste will be hauled to the Kekaha Landfill.

Green waste will be composted and recycled. Glass bottles and aluminum cans will be collected and recycled. Paper products and cardboard will also be collected and recycled.

In regard to liquid waste, wastewater will be treated by an on-site ultraviolet disinfecting wastewater treatment facility. The effluent from this wastewater treatment plant will be used for irrigation on the property.

All affected structures will be elevated above base flood elevations.

No development shall be approved unless the Authority has first found that:

- *The development will not have any substantial, adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect and the elimination of planning options.*
- *The development is consistent with the objectives and policies contained in Chapter 205A, HRS.*
- *The development is consistent with the County general plan, the zoning, subdivision and other applicable ordinances.*

Discussion: The overall environmental and ecological effects of the development will be beneficial. Positive impacts resulting from the project will include protection and improvement of the wetland area and the initiation of a program to revegetate the site with native plants.

As discussed in Section 3.1.4, the proposed project is consistent with the policies and objectives contained in Section 205-A, HRS. Further as shown in Sections 3.2.2, 3.2.3, and 3.2.4, below, the proposed project is consistent with the county general plan, development plans, and zoning.

The Authority shall seek to minimize, where reasonable:

- *Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon.*
- *Any development which would reduce the size of any beach or other area usable for public recreation.*
- *Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management area and the mean high tide line where there is no beach.*
- *Any development which would substantially interfere with or detract from the line of sight toward the sea from the State Highway nearest the coast, or from existing public views to and along the shoreline.*
- *Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.*

Discussion: The proposed project will not alter any water bodies, nor will it reduce the size of any beach or area usable for public recreation. As discussed above, access to and along the shoreline will be continued and improved.

The line of sight from Kaunualii Highway to the sea will not be impacted by the proposed resort. The ocean is not now visible from the highway fronting the project site.

Groundwater quality, and the marine environment, will not be impacted by the proposed resort. No effluent will be discharged to the ocean, and only tertiary treated wastewater will be used for irrigation.

3.2.2 General Plan

The General Plan for the County of Kauai is contained in Chapter 7 of the Kauai County Code. First adopted in 1971, it was updated in 1984, and is currently in the process of being updated again. The General Plan is the primary policy that governs long-range and comprehensive development, use and allocation of land and water resources within the County of Kauai. The General Plan also functions as enabling legislation that establishes the framework, parameters, constraints, and guidelines for all other legal and administrative instruments related to the use, development and allocation of land use and water resources, including:

- Development Plans;
- Comprehensive Zoning Ordinance;
- Subdivision Ordinance;
- Infrastructure Master Plans; and
- Capital Improvement Programs.

The General Plan establishes geographic areas of the County which are intended to be used or developed for various general purposes. The Land Use Element of the General Plan includes maps covering the entire County of Kauai which indicates the general boundaries of land and water areas according to the following general classifications: Agriculture; Open; Rural Residential; Urban Residential; Urban Resort; Urban Mixed Use; Public Facilities. The specific uses or development within these general designations are organized by the Development Plans and regulated by the Comprehensive Zoning Ordinance (CZO) and other instruments. The current General Plan designations for the project site are Open and Agriculture (Figure 8).

3.2.3 Waimea-Kekaha Regional Development Plan

Chapter 10 of the Kauai County Code contains provisions which regulate development in specified districts of the County of Kauai that are determined to be of particular significance because of unique physical and social characteristics. These provisions are intended to ensure that development is compatible with the environmental, social, and cultural needs of the particular special district. Six (6) development plan areas have been established in Chapter 10, including Waimea-Kekaha.

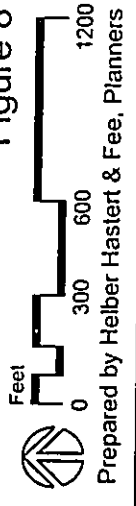


County of Kauai General Plan

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii

Figure 8



The basis of the Waimea-Kekaha Regional Development Plan is a report prepared for the County of Kauai in 1977 (*Waimea-Kekaha Regional Development Plan*). The final draft of this report was adopted as the administrative guidelines that serve as the basis of the Regional Development Plan. The regulations of the CZO and the Subdivision Ordinance apply within the Waimea-Kekaha Region, except to the extent that such regulations or procedures are changed or modified by the provisions of the Regional Development Plan.

The land use map of the *Waimea-Kekaha Regional Development Plan* was intended to establish a 10 to 15 year policy on moderate growth and development of the region. Land use designations for the project site were identified as Agriculture and Open Space.

The goals articulated in the regional plan report were as follows:

- *To have limited growth while not dramatically changing the existing lifestyle in the region.*
- *To create and maintain a role for each town and sub-area in the region.*
- *To maintain growth in consonance with the unique landscape and environmental character of the region.*
- *To insure that all physical growth is consistent with the overall ecology of the area.*
- *To promote and protect the health, safety and welfare of all residents.*
- *To sustain a healthy economy and to create opportunities for a greater diversity of employment.*
- *To create, develop and sustain an economy and population that will require and encourage the educated youth to live in the area.*
- *To provide a desirable house or living quarters for all residents in all income levels.*
- *To create opportunities for a greater fulfillment of life through the development of a broad spectrum of educational and cultural pursuits.*
- *To provide for a maximum variety of outdoor recreational activities.*
- *To recognize those aspects of the region and its people which are historically significant, and to preserve and promote them as a continuing expression of the region's physical and social structure.*
- *To promote the improvement and expansion of the region's economy, by recognizing and carefully utilizing land and water resources.*
- *To provide workable planning tools to meet the changing needs of the community.*

3.2.4 Comprehensive Zoning Ordinance

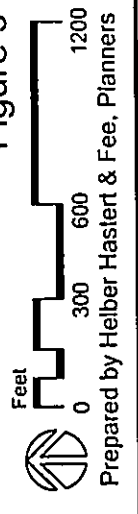
The CZO for the County of Kauai (Chapter 8 of the Kauai County Code), and accompanying maps, define the allowable uses of land within Kauai County. The CZO describes the various zoning districts throughout Kauai County, the uses allowed within each zoning district, and the applicable development standards for each district. The project site is currently a mix of "Open," and "Agriculture" zoning (Figure 9). Resort uses are not permitted in either the Open or Agriculture zoning districts.



County of Kauai Zoning Map

KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii

Figure 9



4.0 ASSESSMENT OF EXISTING CONDITIONS, PROBABLE IMPACTS AND MITIGATION: PHYSICAL ENVIRONMENT

4.1 Climate

Existing Conditions

Temperatures on the coastal plain of West Kauai are generally mild throughout the year, varying from a mean monthly temperature of 70°F in winter to 78°F in summer. Located on the leeward side of Kauai, Kapalawai is a generally dry area that receives the least amount of rainfall on the island. The annual average rainfall at Waimea is about 21 inches (County of Kauai, 1977).

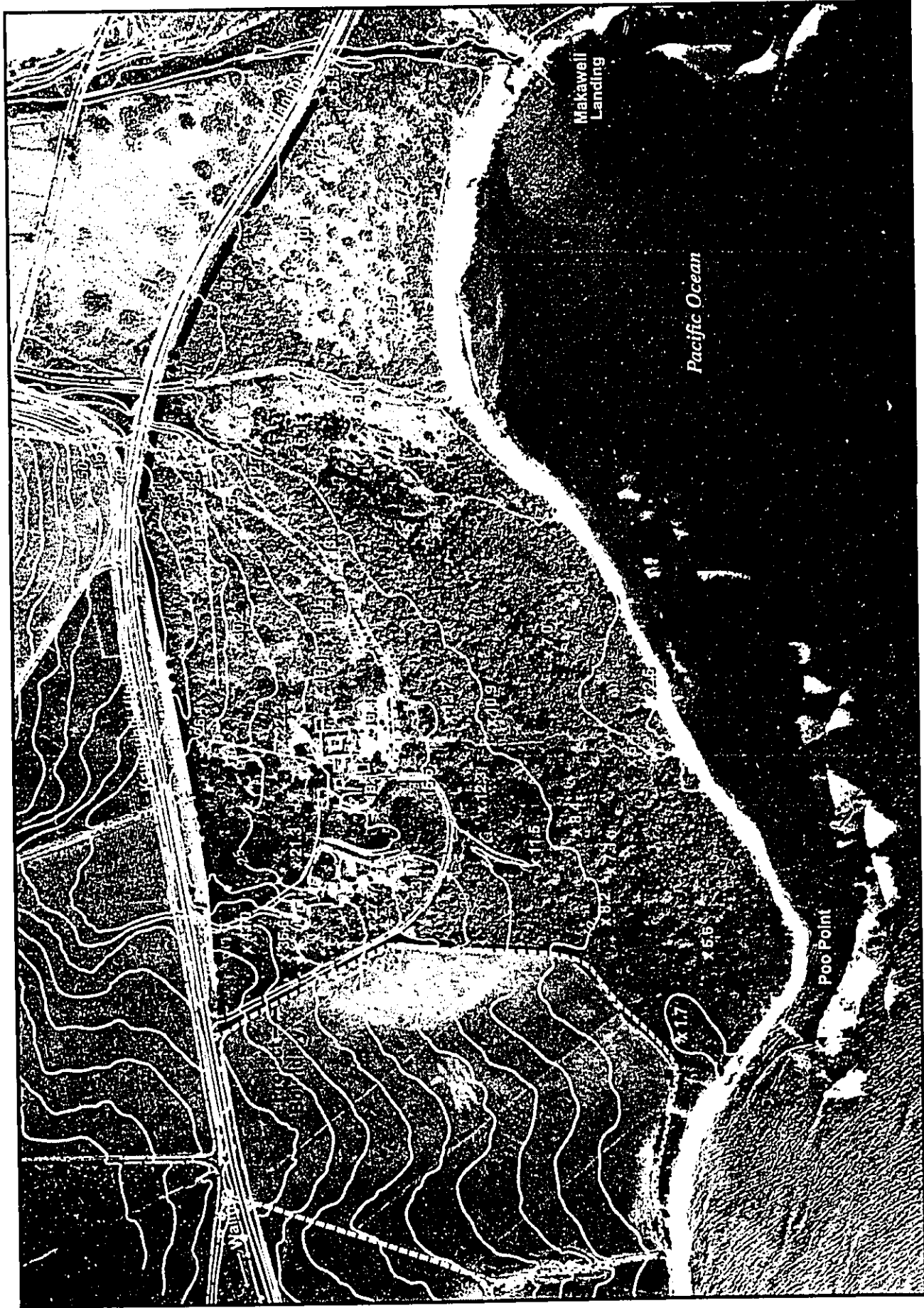
Trade winds reach the area by several paths; down from the mountains or around Mt. Waialeale through Hanapepe, or from around the Na Pali Coast that then travel inland as they reach the coastal plain. Diurnal wind patterns occur during trades weather, bringing sea breezes which arrive during the afternoon to cool the warm air arriving during the day over the coastal area. Cool air comes from the mountains during the night. Strong winds also come from the south during the winter, when the islands are struck by cyclonic storms, otherwise known as "Kona" storms (County of Kauai, 1977).

Since 1960, meteorological data collected by satellites have revealed that storm systems occur more frequently in Hawaiian waters than was previously thought. The Hawaiian Islands are small targets and landfalls are rare. Nevertheless, the tremendous damage caused by Iwa (1982) and Iniki (1992) on Kauai has highlighted the vulnerability of Hawaii to hurricanes. From 1961 to 1995 a total of 44 depressions, 68 tropical storms, and 42 hurricanes have either entered, or formed in, the central north Pacific. Hurricane strength storms typically develop in late summer or fall, when ocean surface temperatures are at a maximum, leading to increased atmospheric instability (University of Hawaii at Hilo, 1998).

4.2 Topography

Existing Conditions

The project site is characterized by a gentle slope, from Kaumualii Highway toward the ocean. Elevations range from about 44 feet above mean sea level (AMSL) in the center of the property at Kaumualii Highway, to about 5 feet AMSL in the southern makai corner of the property (Figure 10). The area between the



Topographic Map
KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii

Figure 10
 Feet 0 300 600 1200
 Prepared by Helber Hastert & Fee, Planners

Mahaikona and the Aakukui Streams is generally flat, with elevations averaging about 7-8 feet AMSL. On the northern side of Mahaikona Stream, slope runs generally from the northeast to the southwest. Slopes from the highway to the ocean are approximately four percent, and approximately one percent at the shoreline.

Probable Impacts

The overall development program will not affect a large portion of the project site. The cottages will be raised above grade (to comply with flood hazard requirements). Therefore, site alteration for these facilities will be minimal. The other major structural additions to the project site will be the two restaurants, the snack bar, the tennis clubhouse, sport courts, and roads and parking areas. With the exception of the tennis clubhouse, all other structures will be elevated to comply with flood hazard regulations. This method of construction (post and beam) involves less ground disturbance, and, therefore, less alteration of topography.

Roadways and parking lots will change the surface characteristics of about seven acres of the property (about 4 percent of the entire site) from pervious to impervious. Although surface characteristics will change, the general topographic features of the property will not change, primarily because slopes are so small (1-4 percent).

The most significant change to the topography of project involves the expansion of an existing drainage course on the Waimea side of the property.

This drainage course is a manmade ditch which stretches from the sugar fields above Kaumualii Highway, under the highway and then makai on the project site whereupon it empties into the project site. The ditch primarily conveys overflow irrigation water and irrigation pump discharge.

The proposed drainage plan (See Section 6.4) requires that the existing drainage ditch be improved as a six-foot deep trapezoidal grass channel, with a bottom width of 30 feet and an overall top width of 54 feet, along a length of about 2,300 feet. In general, the overall topography of the property will not be changed, and existing drainage courses will continue to be utilized. As a result, there will be no significant impacts to topography.

4.3 Hydrogeology

Existing Conditions

The project area lies on a wedge of coastal sediments that are comprised of alluvium on the inland side and grade into beach sands on the coastal side. On the mauka side of Kaumualii Highway, most of the land is covered by the island's later stage Koloa volcanics. However, there are outcrops of the older Makaweli formation which are directly inland from the project site and also comprise the ridge that separates the Waipao and Aakukui Valleys. These outcrops suggest that the more recent Koloa lavas in this area are likely to be a relatively thin cover over the older lava formation. Based on changes in ground slope and water quality data taken from the fishpond, the seaward limit of the Koloa volcanics in this location may actually end somewhere beneath the project site rather than extending to and beyond the shoreline (Nance, 1999).

The fishpond found on the property is spring fed and is an interesting feature. Although it is now almost half filled with silt and is heavily overgrown by vegetation, there are at least two discrete springs that are easily identified by water quality and temperature contrasts. By these same indications, there are also other springs in the pond which are more difficult to specifically locate. One of the two easily identifiable springs is at the inland end of the pond. Its water is relatively warm (72.0° F), has a notably high silica concentration, and has a salinity as low as many sources of drinking water. This water is likely to be discharging from the Koloa formation, possibly at its seaward end (Nance, 1999).

As this water moves across the pond, its salinity becomes slightly elevated and there is some dilution of its silica concentration. The second identifiable spring is in a hydraulically separate arm of the pond that is closer to the shoreline. Water issuing from the bottom of this makai portion of the pond is much colder (67.5° F), has only about half the silica concentration, and is lower in nitrogen and phosphorus than the first spring. The temperature and silica differences suggest that the two identifiable springs are discharging from different aquifers. Water from the makai spring may be derived from the older Makaweli volcanics at depth and its nutrient levels may be altered by passage through the coastal sediments into the pond (Nance, 1999).

Based on the analysis of three recorded levels of water variation in the pond, there is a continuous mauka-makai movement of water through the pond. The discharge rate for this movement is estimated to be about 1.8 million gallons per

day (MGD). These measurements approximate the net discharge rate of springs that feed the larger portion of the pond. This flow combines with spring flow in the makai portion of the pond and discharges through a beach berm at the seaward end of the makai pond. Despite the significant magnitude of this flow rate, no leakage through the berm is visible or detectable as a change in nearshore salinity, even at low tide (Nance, 1999)

Probable Impacts

The current state of the fishpond is characterized by siltation and increased vegetation that covers most open water. Although there is approximately 1.8 MGD of water flowing through the fishpond on a daily basis, many areas of the fishpond suffer from stagnation. The implementation of the project will remove most of the silt and vegetation, and include drawing between 360,000 gpd and 660,000 gpd for on-site irrigation.

None of these actions will have negative impacts on the hydrogeology of the fishpond. In fact, there would be a beneficial impact associated with drawing water for irrigation use in the form of better overall water quality within the fishpond. Increased withdrawal would result in increased turnover (decreased residence time), with a resultant decrease in the presence of algae and phytoplankton. As a result, turbidity would be reduced.

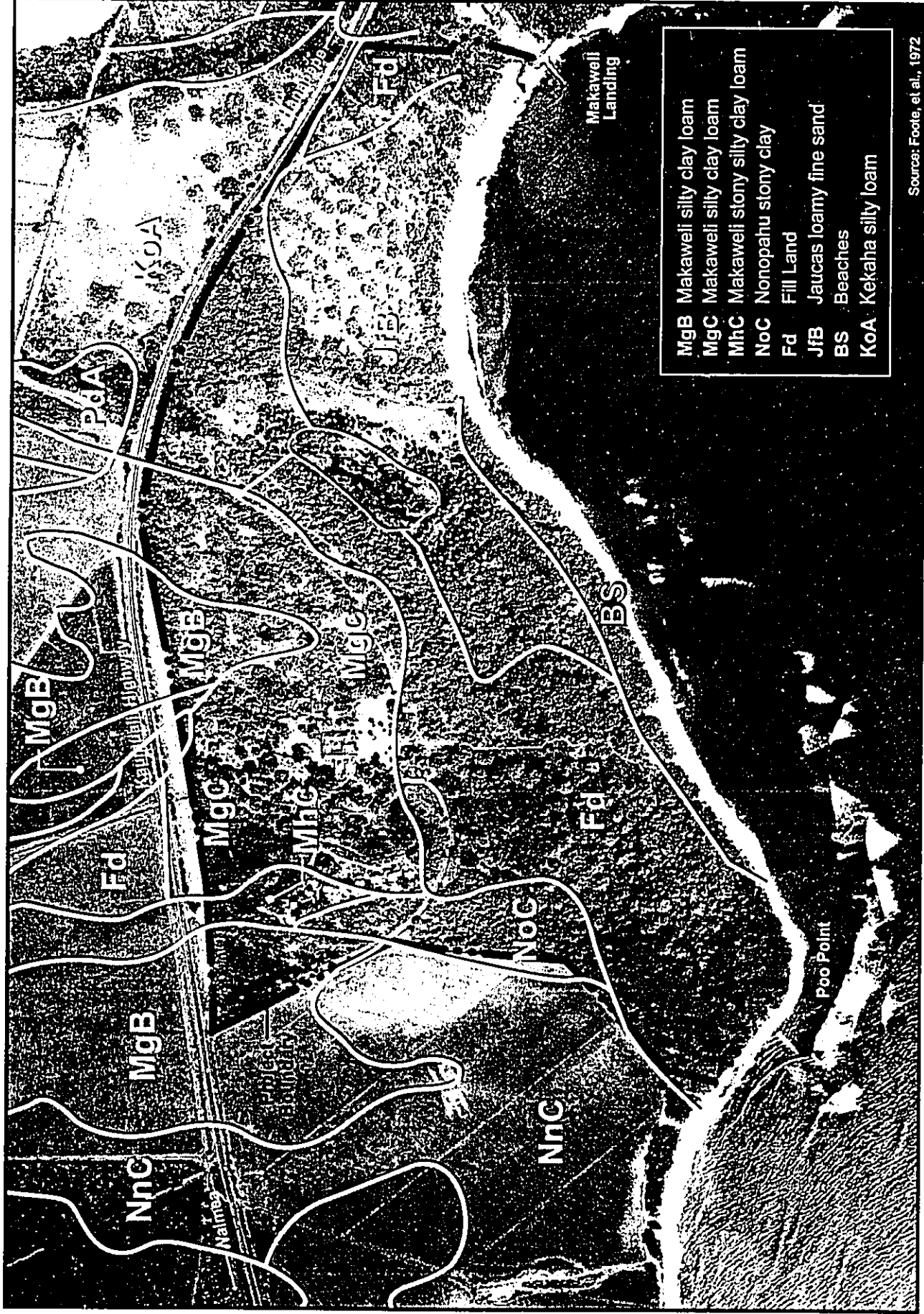
The water level in the fishpond could drop slightly with increased withdrawal, but would ultimately reach equilibrium balancing input and throughput.

4.4 Soils

Existing Conditions

Seven (7) soil types are found on the project site (Figure 11):

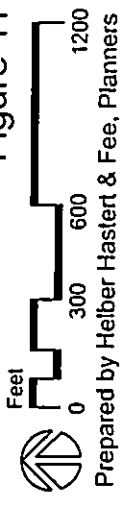
Beaches (Bs)
Fill land (Fd);
Jaucas loamy fine sand (JfB);
Kekaha silty loam (KoA);
Makaweli silty clay loam (MgC);
Makaweli stony silty clay loam (MhC); and
Nonopahu stony clay (NoC).



Soils Map

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 11



The three soils types that comprise over 80 percent of the property are Fill land, Jaucas loamy fine sand and Makaweli silty clay loam.

Fill land (Fd)	This land type consists mostly of areas filled with bagasse and slurry from sugar mills. A few areas are filled with material from dredging and from soil excavations. Generally, these materials are dumped and spread over marshes, low-lying areas along the coastal flats, coral sand, coral limestone, or areas shallow to bedrock.
Jaucas loamy fine sand (JfB)	The Jaucas series consists of excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean. They developed in wind- and water-deposited sand from coral and seashells. The loamy fine sand soil of this series has slopes of 0 to 8 percent. In terms of agricultural capability, these soils are classified as "IVs," which have severe limitations because of stoniness, shallowness, unfavorable texture, or low water-holding capacity. They are well drained to excessively drained and are more than 20 inches deep.
Makaweli silty clay loam (MgC)	The Makaweli series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material weathered from basic igneous rock. This silty clay loam has slopes of 6 to 12 percent. Runoff is medium, and the erosion hazard is moderate. In terms of agricultural potential, if irrigated, these soils are classified as "IIIe," which are subject to severe erosion if they are cultivated and not protected. In most places the soils are more than 20 inches deep.

Source: Foote, et al., 1972

Probable Impacts

As discussed in Section 4.1 (Climate), above, the area in the vicinity of the project site receives relatively little rainfall (about 21 inches). Consequently, the upper soil levels are usually quite dry and subject to wind erosion if exposed. Because of these site characteristics, wind erosion and fugitive dust are more of a concern than stormwater erosion.

The probability of wind erosion will be highest during the construction of the resort, resulting in short-term impacts.

Mitigation

Compliance with Best Management Practices (BMPs) will mitigate the potential effects of exposing bare soil to wind erosion. BMPs will include: wetting exposed soil; erecting silt barriers, as necessary; and limiting the area of ground disturbance, among others.

4.5 Agricultural Capability

Existing Conditions

Agricultural Lands of Importance to the State of Hawaii (ALISH). ALISH maps have been developed by the State Department of Agriculture to determine the relative agricultural importance of specific property. There are three possible ALISH designations found on the ALISH maps. These are:

- | | |
|---------------|---|
| Prime | Land which has the soil quality, growing season, and moisture needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods. |
| Unique | Land that has the special combination of soil quality, location, growing season, moisture supply, and is used to provide sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods. |
| Other | Land other than Prime or Unique land that is also of State-wide or local importance for agricultural use |

Approximately 70 percent of the project site has been designated as "Other." The remaining 30 percent of the project site is identified as "Prime" (Figure 12). Approximately half of the area designated as "Prime" comprises the compound defined by the main house and its accessory buildings, and the employee housing (Department of Agriculture, 1977).

Detailed Land Classification. The Detailed Land Classification publications were prepared by the University of Hawaii to provide an analysis of lands and their respective suitability for agricultural production taking into consideration a wide variety of factors including soils, geology, topography, climate, and water resources. The classification scheme provides ratings for overall agricultural usage, which are useful in making general assessments of land qualities. Lands are classified from "A" to "E" according to their agricultural suitability. A rating of "A" indicates a master rating of very good; "B" indicates good suitability; "C" indicates fair suitability; "D" indicates poor suitability; and a rating of "E" indicates very poor suitability for agricultural use. The project site has a mixed rating of D and E, indicating poor to very poor suitability for agricultural use (Figure 13) (University of Hawaii, 1963).

Probable Impacts

Over the time period the project site has been owned by the Robinson family, it has never been used for commercial agriculture. The family did use a ±3.5-acre



Agricultural Lands of Importance to the State of Hawaii (ALISH)

KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii

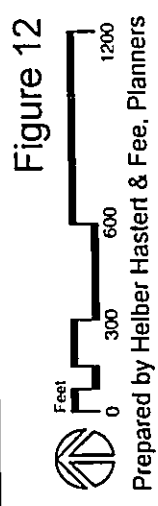
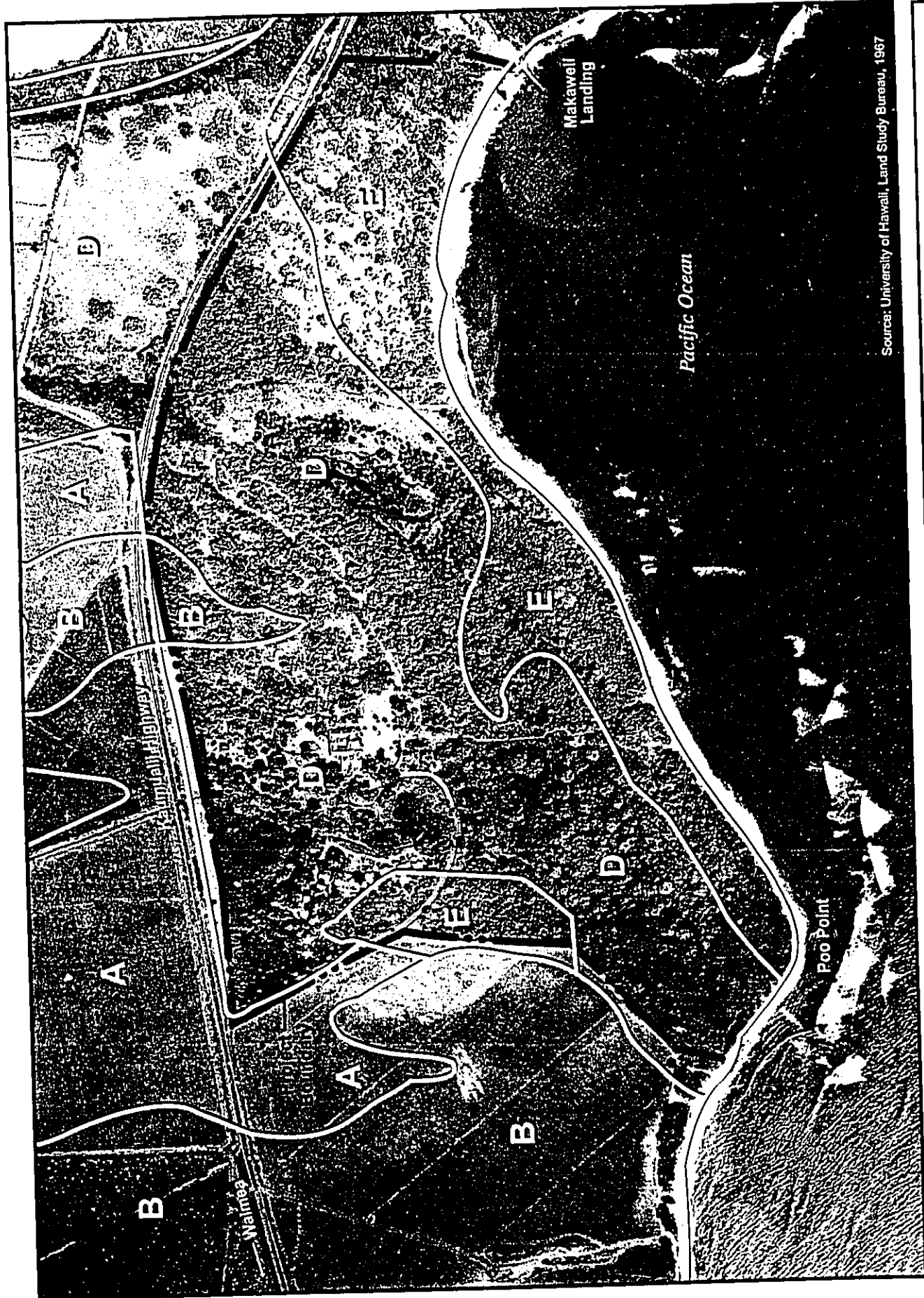
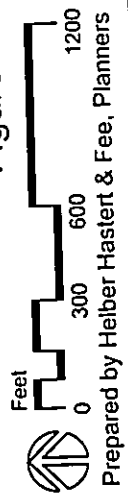


Figure 12



Sources: University of Hawaii, Land Study Bureau, 1967

Figure 13



Detailed Land Classification

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii



area near the main house to raise fruits and vegetables for personal consumption. They also used other areas of the project site to raise livestock such as cattle, pigs, goats, chickens, and fish (in the fishpond). As recently as this year, portions of the project site were used as pasturage for about 20 bulls. However, these animals have since been removed.

Therefore, the development of the project site as a resort will have no impact on agricultural production on Kauai. Although the property is designated "Agricultural" at various levels of State and County land use designations, it has never supported agricultural use, except for the personal consumption of the family. The 3.5-acre "garden" will continue to be maintained, but the balance of the property will not be used for agricultural activities.

4.6 Flora

Existing Conditions

A botanical survey of the project site was conducted in March 1999 by Char & Associates. A summary of their findings is presented below and their full report is attached as Appendix A.

The vegetation on the property is dominated by introduced or alien plants. This is not surprising as the site was a primary residence for the Robinson family. Portions of the property have been used for employee housing, stables, corrals, pasturage, fruit orchards, and vegetable gardens.

Today, the majority of the site is covered by scrub vegetation, and has been used for grazing cattle over many decades. Wetland vegetation is found along the two streams (Mahaikona and Aakukui) which cross the site. A marshy area exists on the western side of the property. This area was created by the flow of sugar irrigation runoff and pump discharges from mauka areas via a man-made ditch. A very narrow band of coastal vegetation is found behind the white sand beach on the makai side of the property.

A more detailed description of the three vegetation types (scrub, wetland, coastal) follows. The former residence, employee housing area, and other actively maintained areas near the northwest corner of the property were not included in the survey, because they were not expected to harbor remnant native plant-dominated communities.

Scrub Vegetation. This vegetation type is basically open to closed canopy kiawe (*Prosopis pallida*) scrub forest with scattered shrubs such as lantana (*Lantana camara*), hairy abutilon (*Abutilon grandifolium*), *koa haole* (*Leucaena leucocephala*), and patches of Guinea grass (*Panicum maximum*) and buffelgrass (*Cenchrus ciliaris*). Much of the area covered by scrub vegetation and identified as having "Fill land" as a soil type, supports patches of grasses and mostly weedy annual species. Scattered about are large, old trees of kiawe, `opiuma (*Pithecellobium dulce*), and monkeypod (*Samanea saman*). Commonly observed plants include swollen fingergrass (*Chloris barbata*), buffelgrass, guinea grass, spiny amaranth (*Amaranthus spinosus*), lion's ear (*Leonotis nepetifolia*), `aheahea (*Chenopodium murale*), coffee senna (*Senna occidentalis*), and cocklebur (*Xanthium strumarium*). Golden crown-beard (*Verbesina enceliodes*), a member of the daisy family with large yellow flowers and up to two feet tall, is locally abundant.

Along the makai perimeter of the property, there is dense band of kiawe and `opiuma trees. In this area, there are scattered groves of coconut (*Cocos nucifera*) and date (*Phoenix sylvestris*) palms, and small stands of *milo* trees (*Thespesia populnea*). Lantana and wild basil (*Ocimum gratissimum*) shrubs are locally common under the trees.

In the area between the two streams, the scrub vegetation consists of rather dense stands of `opiuma trees, 6 to 20 feet tall and two to three feet in diameter. Bermuda grass or *manienie* (*Cynodon dactylon*) and buffelgrass form extensive patches on the sand substrate. Shrubs of `ilima (*Sida fallax*), a native species with orange flowers, is also common.

Along the western portion of the property is an area with many surface stones. This area supports a closed canopy kiawe forest with Guinea grass understory.

Along the mauka portion of the property, the scrub vegetation, in places, is composed of koa haole thickets 12 to 15 feet tall, with a ground cover of dense Guinea grass clumps up to three feet tall. There are also areas with open kiawe and Guinea grass scrub. These areas often have a few large trees of mango (*Mangifera indica*), Java plum (*Syzygium cumini*), Chinese banyan (*Ficus microcarpa*), monkeypod, royal palm (*Roysonia* sp.), and many large thickets of bougainvillea. There is also a large patch of spineless or cochineal cactus (*Opuntia cochenillifera*) near the dirt road that accesses the employee's housing area.

Wetland Vegetation. The banks of Mahaikona and Aakukui streams are well-defined with no low lying overflow areas. The top of the stream banks support scrub vegetation. Along the bottom banks, next to the water's edge, there are mats of California grass (Brachiaria mutica) and shrubs of Indian Pluchea (Pluchea indica). Wetland vegetation is denser and more varied along Aakukui Stream, especially in the area behind the beach. There are dense mats of California grass and thickets of Indian Pluchea as well as clumps of bulrush or *kaluha* (Schoenoplectus californicus) up to 7 feet tall, umbrella plant (Cyperus alternifolius), and Napier grass (Pennisetum purpureum). Further upstream, *honohono* (Commelina diffusa) is locally common.

A grove of coconut trees lines the perimeter of the fish pond. Along the north side of the pond, there are dense thickets of purple and rose-red (Bougainvillea glabra) bougainvillea. Bulrush 3 to 12 feet tall, has filled in much of the pond. A few open water areas are found mostly along the north side of the pond. These patches of open water support California grass along their margins and floating aquatics such as water hyacinth (Eichornia crassipes) and duckweed (Lemna aequinoctialis). The drainage canal which runs from the pond to the beach is covered by dense floating mats of water hyacinth and water lettuce (Pistia stratiotes).

A low lying area in the western portion of the project site where discharge water from the fields mauka of the highway has been directed, supports dense clumps of umbrella plant, 2 to 4 feet tall, and standing water 6 inches to one foot deep. Job's tears (Coix lachryma-jobi) and primrose willow or *kamole* (Ludwigia octovalvis) are locally abundant. Along the northern half of the low lying area, there are low, open, grassy patches of Bermuda grass with scattered plants of primrose willow, false daisy (Eclipta prostrata), green kyllinga (Kyllinga brevifolia), *honohono*, and jungle rice (Echinochloa colona). A few mats of the aquatic azolla fern (Azolla filiculoides) are found in areas with small pools of water. There are a few large trees in and around this low-lying area, some of which have died back due to the water-logged soils and anaerobic conditions.

Coastal Vegetation. A narrow band of coastal vegetation is composed primarily of *pohuehue* or beach morning glory vine (Ipomea pes-caprae), Bermuda grass, and *`aki`aki* or beach dropseed grass (Sporobolus virginicus). Scattered are low, windswept clumps of *koa haole* shrubs and trees of *kiawe*, *`opiuma*, and *milo*.

Also, a long-spined algaroba or mesquite species (Prosopis juliflora) has become established in the coastal vegetation. This sprawling large shrub to medium-sized

tree has thick spines up to two inches long. Several large plants on the site had numerous clusters of pale yellowish brown pods. A number of saplings were observed inland of the coastal vegetation.

None of the plants inventoried on the site is a threatened and endangered species; nor is any plant a species of concern. All of the plants can be found in similar environmental habitats throughout the Hawaiian Islands.

Probable Impacts

The 470-acre project site has been disturbed for a long period of time. The Robinson family home was constructed around 1897 and the site was extensively landscaped. Almost all of the property appears to have been managed by human activity during some point in time, since at least 1897.

None of the plants inventoried on the site is a threatened or endangered species; nor is any plant a species of concern. All of the plants identified on the property can be found in similar environmental habitats throughout the Hawaiian Islands. In this context, there will be no significant impacts to native vegetative habitats resulting from development of the proposed project.

This includes the man-made marshy area on the Waimea side of the property which has been created by allowing irrigation runoff water and filter discharges to collect on the ground. The water source which created this habitat will soon be eliminated when a mauka detention basin is completed. Once this water flow is discontinued, wetland vegetation is expected to die back and be replaced by scrub vegetation.

Other areas of the project site will benefit from development because irrigation water will be made available that will be able to support more plant life. This will also help to prevent soil erosion caused by the wind. To the greatest extent possible, native plants will be used to landscape the property.

From a botanical perspective, the presence of large numbers of the long-spined mesquite species (Prosopis juliflora) on the coastal area of the property are a primary concern. To date, the plants have only been known from Oahu at Sand Island and vicinity. If not eradicated, the plants could form large, impenetrable, spiny thickets in low land, dry habitats throughout Kauai.

Mitigation

It is recommended that all individual Prosopis juliflora plants be eradicated. Appropriate methods of eradication should be coordinated with the State Department of Agriculture.

It is also recommended that native plants be incorporated into the landscape plan for the proposed resort.

4.7 Fauna

Existing Conditions

An avifauna and feral mammal survey of the project site was conducted in March 1999 by Philip Bruner. A summary of his findings is presented below and his full report is attached as Appendix B.

No native landbirds were recorded during the survey. Given the location, elevation and type of habitats available at this site, the absence of native landbirds was not unexpected. The short-eared Owl or Pueo (Asio flammeus sandwicensis) forages in agricultural fields and pastures as well as in upland forested habitat, and is fairly common on Kauai. Although this species was not recorded during the present survey it could forage in the area.

Migratory shorebirds winter in Hawaii between the months of August through May. Some juveniles will stay over the summer months as well. Three species of migratory shorebirds were recorded during the survey. These were the Pacific Golden-Plover (Pluvialis fulva), the Ruddy Turnstone (Arenaria interpres) and the Wandering Tattler (Heteroscelus incanus). None of these species are listed as endangered or threatened.

Six individuals of the endangered Common Moorhen (Gallinula chloropus) were observed near open streams and along the edges of the fish pond and the man-made marsh habitat. A pair of Hawaiian Duck or Koloa (Anas wyvilliana) were flushed from Aakukui Stream. Koloa are endangered but are still relatively common on Kauai. A total of four Black-crowned Night Herons (Nycticorax nycticorax) were observed. This species is the only native waterbird that is not endangered.

A total of 17 species of exotic birds were recorded during the course of the field survey. The more common of these species include: the Red Junglefowl (Gallus gallus); the Spotted Dove (Streptopelia chinensis); the Zebra Dove (Geopelia striata); the Northern Cardinal (Cardinalis cardinalis); the Red-crested Cardinal (Paroaria coronata); and the House Finch (Carpodacus mexicanus).

The endemic and endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) is frequently seen on Kauai. This species is known to roost solitarily in trees and forages for insects using echolocation. They use a variety of habitats, including native forest, ranchlands, ponds and bays, as well as urban areas. Three bats were observed foraging for flying insects offshore the project site and one bat was observed flying back and forth over the man-made marsh.

Several feral cats were seen on the site, and feral dog and pig tracks were also observed. Rats and mice undoubtedly occur on the property, but were not seen.

Probable Impacts

The project site has been significantly altered by introduced vegetation and ranching activities. No unusual or unexpected species were recorded, even though three endangered species were observed on the property: Common Moorhen (Gallinula chloropus); Koloa (Anas wyvilliana); and Hawaiian Hoary Bat (Lasiurus cinereus semotus).

Although endangered, the Hawaiian Hoary Bat is fairly common on Kauai. The proposed development should not adversely impact foraging opportunities for the bats. They are known to forage in urban as well as forested habitats.

Although there are several wetland type habitats on the project site, most are overgrown with emergent vegetation. This restricts their access to waterbirds. If these areas were opened up by removal of vegetation, they would provide better habitat for waterbirds. A complete removal of vegetation in the fishpond would not be attractive to native waterbirds because they require some cover (in the form of emergent vegetation) to avoid predators or as a place to retreat when disturbed.

The marsh area on the Waimea side of the property, created by the sugar irrigation runoff and pump discharges, will lose its source of water in the near future as a detention basin being built by Gay and Robinson, Inc. is completed mauka of Kaumualii Highway. This will cause the area to dry up and lose its

wetland characteristics. However, the loss of this area will not be significant because of the presence of the fishpond and other habitats associated with the Mahaikona and Aakukui Streams. This is particularly true if the fishpond and streams are cleared, thereby creating additional open water habitat.

Mitigation

It is recommended that some vegetation be retained in the fishpond, particularly the vegetation on the small island in the center of the fishpond. The advantage of focusing vegetation on the island would be that the island would provide cover and nesting opportunities that would be protected from cats and other predators.

4.8 Marine Environment

Existing Conditions

A marine assessment of the nearshore area fronting the project site was conducted by Marine Research Consultants. A summary of their report is presented below and their full report is attached as Appendix C.

PHYSICAL STRUCTURE OF THE NEARSHORE ENVIRONMENT

A narrow sand beach stretches along the length of the project boundary for about 5,200 feet. Along the southern end of the property, from near Aakukui Stream to the Makaweli Landing, the nearshore marine environment consists of a shallow, gently sloping plain of fine-grained red mud. Near the shoreline, the mud grades into a mix of mud and sand. The mud zone extends uninterrupted from near the shoreline to a distance of approximately 1 kilometer (km) offshore. Within this area there is virtually no exposed solid bottom, as such there is no reef development. It is apparent that Hoanuanu Bay receives (or has received) substantial quantities of terrigenous sediment during periods of runoff. It also appears that the topography (shape) of the bay is such that sediments are retained within the coastal indentation, and are not rapidly flushed from the area. As a result, there is a substantial permanent depositional zone of mud within the bight of Hoanuanu Bay at the southern end of the Kapalawai property. The nearshore coastal waters fronting Kapalawai are designated Class "A" waters. It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected by the State of Department of Health.

From the point where Aakukui Stream would cross the shoreline northward, the nearshore area is made up of two zones; an inner reef flat and an outer reef front that are separated by a shallow reef crest. Long-period swells become breaking waves on reaching the reef crest. As a result of the high energy, few corals occur on the crest. Bottom composition of the reef flat consists of muddy sand and coral rubble; maximum water depth on the reef flat is approximately 2 meters (m). Because of the shallow depth, high terrigenous sediment content and vigorous water motion from wave energy, water clarity on the reef flat is highly turbid. However, living colonies of corals were observed on the reef flat, predominantly lobate hemispherical heads of Porites lobata, and sturdy, branching colonies of Pocillopora meandrina.

Seaward of the reef crest, the bottom slopes gradually downward with distance offshore. The underwater physiographic structure in the nearshore zone consists of a platform of lithified reefal limestone. While areas of the platform are relatively flat, other regions are characterized by substantial vertical relief in the form of deep grooves and undercut ledges in what appears to be ancient coral reef platform. Vertical relief of the reef structures is generally not more than one meter. Grooves and channels in the reef platform are generally filled with coarse sand and rubble. The surfaces of the reef platforms are heavily pitted, probably as a result of bioerosion, resulting in an extremely friable (breakable) upper surface. A ubiquitous feature of the reef platform is a veneer of red mud sediment that appears to be bound to the limestone surface within a short layer of algal turf. The thickness of the muddy layer decreases with distance northward and offshore. The predominant biota on the inner reef platform are flat encrustations of several species of stony corals, and calcareous algae.

The entire area offshore of the proposed project is exposed to long-period swells generated by storms in the north Pacific during the winter months, and the south Pacific in the summer months. As a result of the physical forces associated with winter waves, the nearshore areas off Kapalawai are subjected to extreme stress from wave impact and scouring of sediment from wave action. As in many locations in the Hawaiian Islands, the composition of coral reef communities is structured primarily in response to physical forces of breaking waves. In addition, the high loading and accumulation of terrigenous sediment in the areas offshore of Kapalawai appear to be a major factor in affecting biotic composition of the reef communities.

WATER CHEMISTRY

Methods. Two locations fronting the Kapalawai site were selected as sampling sites for evaluation of existing water chemistry. Site 1 lies at the northern end of the property off the southern side of Poo Point; Site 2 lies off the southern end of the property, originating near the point where Mahaikona Stream enters the ocean. Water chemistry was evaluated along sampling transects at each site. Each transect was oriented perpendicular to the shoreline, and extended from the highest wash of waves across the nearshore reef platform out to the open ocean, a distance of approximately 500 meters (m).

Water samples were collected at nine stations along each transect. Such sampling was intended to span the entire range of material input at the shoreline to the open coastal ocean. Sampling was more concentrated in the nearshore zone as this area is most likely to show the effects of shoreline modification. At each station a surface sample was collected within approximately 10 centimeters (cm) of the surface. With the exception of the stations located on the reef flat within 50 m from the shoreline, a bottom sample was collected within 1 m of the sea floor.

Water quality constituents that were measured included the specific criteria designated for open coastal waters in Chapter 11-54, Section 06 (Open Coastal waters) of the State of Hawaii, Department of Health (DOH) Water Quality Standards. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen ($\text{NO}_3^- + \text{NO}_2^-$, hereafter referred to as NO_3^-), ammonium (NH_4^+), total phosphorus, chlorophyll a (Chl a), turbidity, temperature, pH and salinity. In addition, orthophosphate phosphorus (PO_4^{3-}) and silica (Si) are also reported because these parameters are sensitive indicators of biological activity and the degree of freshwater input to the ocean, respectively.

Environmental Conditions. Water samples were collected on March 13, 1999. Environmental conditions were sunny with light winds from the south. It is important to note that much of the rest of Kauai was experiencing heavy rainfall during the survey, while the weather was sunny at Kapalawai. Such a situation appears to be the norm, as the leeward side of the island is typically nearly arid in climate. Ocean conditions consisted of calm seas with small surf breaking on the reef crest. Water sampling was conducted during slack tide at approximately +0.2 feet above mean low water.

Horizontal and Vertical Stratification. Examination of data reveals several distinct patterns with respect to horizontal stratification of water chemistry. The plot of salinity vs. distance (from shore) reveal a sharp gradient of increasing salinity on the reef flat between the shoreline and 50 m offshore. As there was no streamflow reaching the ocean during the sampling, the freshwater input to the area appears to be from efflux of groundwater in the nearshore zone that mixes with oceanic water (~35‰). Freshwater efflux appears to be greater on the northern transect relative to the southern transect. Seaward of the reef flat, there was little evidence of variation in salinity between the samples collected 100 to 500 m from shore.

The plots of dissolved nutrients Si, NO_3^- , TN, PO_4^{3-} and TP exhibit patterns that are mirror images of the patterns of salinity. Groundwater normally contains high concentrations of these nutrients and low salinity, while seawater typically contains low nutrient content and high salinity. While salinity is also generally low in surface runoff (i.e., rainfall), nutrients are also low; hence there is relatively little corresponding increase in nutrients with decreased salinity. Hence, the mirror images of salinity and concentrations of nutrients off Kapalawai indicate input of groundwater at the shoreline.

As freshwater is lower in density than seawater, there is also an indication of vertical stratification of nutrients and salinity. Salinity is consistently higher in bottom samples than surface samples, which nutrient concentrations are elevated in surface samples relative to bottom samples. However, at the sampling stations that exhibited the greatest variation in nutrient concentrations and salinity on the reef flat, the shallow depth of water precluded sampling at the surface and bottom.

The patterns of distribution of dissolved organic nutrients (DON, DOP) and NH_4^+ that are not present in relatively high concentrations in groundwater are distinctly different from the patterns for inorganic nutrients. The concentrations of NH_4^+ on the south transect are essentially constant in value across the entire transect. On the north transect the concentrations of NH_4^+ peak at the outer boundary of the reef flat. Profiles of DON and DOP show little pattern throughout the sampling regime.

On both transects, TSS and turbidity peaked at the shoreline and decreased with distance from shore. TSS and turbidity were also higher on the northern transect compared to the southern transect from the shoreline to a distance of 300 m from

shore. Chl *a* was also highest on the reef flat, peaking in concentration at the shoreline on the north transect and 25 m from shore on the southern transect.

Compliance with DOH Standards. DOH standards include specific criteria that are not to be exceeded during either 10% or 2% of the time, or as the geometric mean of the sampling set. With only one sample set collected to date from each sampling station, comparison of the 10% or 2% criteria or the geometric mean criteria for any sampling station are not statistically meaningful. However, comparing sample concentrations to these criteria provide an indication of whether water quality is near the stated specific criteria.

Data shows samples seaward of the shoreline that exceed DOH water quality standards for open coastal waters under "wet" conditions. The criteria for wet conditions are applied to the Kapalawai area because this region probably receives at least 3 million gallons of groundwater input per mile per day. During the March 1999 survey, several constituents exceeded the 10% or 2% limits. On the north transects NO_3^- , turbidity and Chl *a* in samples within 50 m of the shoreline exceeded specific criteria. On the south transect, these constituents, as well as NH_4^+ , exceeded specific criteria. The recorded concentrations of NH_4^+ and Chl *a* exceeded specific criteria from the shoreline to a distance of 300 m from shore on the southern transect.

As noted in the section above, NO_3^- is a natural component of groundwater. In areas that receive substantial input of groundwater there is typically a zone of mixing near the shoreline where NO_3^- concentrations may consistently exceed DOH criteria as long as physical mixing processes remain low. However, NH_4^+ is not a normal component of groundwater. It is apparent that some other source of NH_4^+ than groundwater input is responsible for the elevated concentrations along almost the entirety of the south transect off of Kapalawai.

BIOTIC COMMUNITY STRUCTURE

Coral Communities. The predominant taxon of macrobenthos (bottom-dwellers) throughout the reef off the Kapalawai area are Scleractinian (reef-building) corals and benthic macroalgae. Results of qualitative reconnaissance surveys indicated that reef coral occurrence did not occur in the area off Mahaikona Stream owing to deposition of substantial reservoirs of red mud. To the north of the stream bed, the mud bottom decreased, grading into a reef platform composed of pitted limestone. On the reef platform, living coral abundance was relatively consistent along the northern portion of the Kapalawai property. Coral abundance also

peaked within a zone approximately 50-100 m seaward of the reef crest in the region of the high relief limestone platform. With distance seaward, bottom topography flattened to a relatively featureless platform with low coral abundance.

Results of quantitative line transects conducted in two typical reef zones provide an estimate of coral community structure. In total, eight species of "stony" corals, were encountered on transects. Total coral cover was substantially higher on the shallower transects (30-32%) compared to the deeper transects (2-3%). The dominant species on the two north transects and the deep southern transect was Porites lobata, which accounted for about 37% of total coral cover. The other dominant species, especially on the shallow southern transect was an encrusting coral identified as Leptoseris spp. This coral is generally not found in abundance in shallow water on Hawaiian reefs, and is usually limited to deeper water. The anomalously high abundance of the species is likely a result of the consistently high sediment loads in the nearshore waters. Other coral species encountered on transects included several forms of the genera Montipora (M. verrucosa and M. patula) and Pocillopora (P. meandrina and P. damicornis).

The growth form of most of the corals that were present in the study area consisted of flat encrustations or low sturdy lobate structures. Branching and vertically plated species were observed primarily on the sides of channel cuts.

Other Benthic Macroinvertebrates. The other dominant group of macroinvertebrates generally found on Hawaiian reefs are the sea urchins (Class Echinoidea). However, on the reefs surveyed off Kapalawai, urchins were very rare. The only urchin that was observed was Echinometra matheai, which are small urchins that are generally found within interstitial spaces bored into the limestone substrata. Several Crown-of-thorns starfish (Acanthaster planci) were observed on the reef. Nearby bleached skeletons of colonies of Pocillopora meandrina suggested that the starfish had been feeding on these corals. Numerous sponges were also observed under ledges and in interstitial spaces. Several spiny lobsters (Panulirus spp.) were also observed under ledges.

Benthic Algae. Frondose benthic algae were common throughout the nearshore region. In addition, encrusting red calcareous algae (Porolithon spp., Peysoneilia rubra, Hydrolithon spp.) were common on exposed limestone surfaces throughout the study area. Dominant species of frondose algae observed on the reef included the genera Dictyopteris, Dictyota, Sargassum, and Turbinaria, and the red alga, Amansia, Asparagopsis, Corallina, Laurencia, Liagora, Martensia,

and Plocamium. All of these plants occurred commonly on the limestone platform.

Reef Fish Community Structure. In general, reconnaissance surveys indicated that the reef fish community off the Kapalawai area was limited in numbers of both species and individuals. However, reef fish community structure was largely determined by the topography and composition of the benthos. On the outer flat reef platform, fish abundance was substantially lower than on the inner zones characterized by high vertical relief which affords shelter to fish. The most abundant fish throughout the survey area was the blue-lined snapper (*ta'ape*, Lutjanus kasmira). Most of the other fish observed were Juveniles fish belonging mostly to the families Pomacentridae (damselfish), Acanthuridae (surgeonfish), with representatives from the families Labridae (wrasses), Mullidae (goatfish) and Chaetodontidae (butterfly fish). The complex habitat created by the eroded limestone reef provided limited shelter for small fish.

Overall, fish community structure off Kapalawai is poor when compared to assemblages found in relatively undisturbed Hawaiian reef environments. The lack of an abundant fish community suggests that either the area has been subjected to substantial amounts of fishing pressure, or the environmental conditions (e.g., suspended and deposited terrigenous sediments) result in a sub-optimal setting for fish.

Endangered and Protected Species. Three species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (Chelonia mydas) occurs commonly throughout the island chain, and is known to feed on selected species of macroalgae. The endangered hawksbill turtle (Eretmochelys imbricata) also occurs, but is considered rare compared to the green turtle. Several green sea turtles were sighted on the surface and underwater during the surveys off Kapalawai. Many of the turtles sighted underwater were either swimming slowly near the bottom or resting within crevices or under ledges in the reef.

Populations of the endangered humpback whale (Megaptera novaeangliae) are known to winter in the Hawaiian Islands from December to April. Hawaiian monk seals (Monachus schauinslandi) also occur occasionally in waters off the high islands. No monk seals were observed during the surveys off Kapalawai.

Probable Impacts

Implementation of the proposed plan for the Kapalawai Project will involve grading and some vegetation removal associated with construction of the resort structures, although disturbed areas will be landscaped as part of the project design. Construction of roadways and parking areas will increase the amount of impervious surfaces compared to the present situation. However, there are no changes planned to the existing shoreline or nearshore area. The overriding findings of the marine environmental assessment is that at present, both water quality and biotic community composition are strongly influenced by terrigenous sediment in the nearshore ocean. This sediment appears to originate from runoff from upland drainage basins, and maintains a long residence time within the shoreline fronting the project site. Hence, even if delivery of sediment is halted, it appears that the material presently on the bottom would remain in the system for an extended period of time. Water quality in the nearshore zone reflects high levels of suspended sediment that appears to be a consistent characteristic of the area regardless of season and weather. While coral communities occur in the outer reef area, it appears that the composition of these communities are strongly biased toward species that are sediment-resistant.

Results of water chemistry surveys conducted off the Kapalawai site reveal that a surface layer of low salinity, high nutrient groundwater occurs in the nearshore area as a result of efflux of groundwater. However, owing to rapid mixing, and the high level of suspended material in the nearshore zone, there is little response to the input of high nutrient water in terms of benthic algal growth. Plans for the Kapalawai Resort specify usage of an on-site wastewater treatment system that will result in effluent (reclaimed water) for use as an irrigation source on the property. As a result, none of the wastewater generated by the project will be discharged directly to the ocean.

It is anticipated that this method of wastewater disposal will have no impact to the marine environment for several reasons. In light of the observed substantial input of dissolved inorganic nutrients to the nearshore ocean as a result of existing groundwater fluxes that reflect current and past land uses, the small augmentation to groundwater from the proposed disposal of wastewater is likely to be undetectable or very small. In addition, the unrestricted circulation of the offshore zone by tidal and wind-driven currents, eddies, and wave action promotes rapid dilution and water exchange. While the residence time of deposited sediment appears relatively long, the residence time of a parcel of

water fronting the development is probably on the order of hours to days, so long-term buildup of any dissolved constituent is unlikely.

While the planned project at Kapalawai may result in a temporary increase in exposed soil during the construction that could reach the ocean through runoff, it is likely that such an increase would be essentially undetectable when compared to the existing situation. The increased impervious surfaces that will result from the construction of roadways on the property may actually reduce sediment delivery to the ocean as the roadways will replace lands otherwise subject to erosion. Preliminary drainage calculations indicate that there are nearly 8,000 acres of land area that drain through the project site. Thus, the changes to the approximate 100 (of ~~470~~ 153,696) acres of the project site as a result of project implementation will have an insignificant impact to offshore water.

Potential Effects to Protected Species. The threatened green sea turtle occurs in the nearshore areas off the project site. Because there is no plan for any work on the shoreline or in the nearshore region, there is no potential for activities that might affect health or behavior of turtles (or any other protected species). Potential changes in water quality that might occur as a result of construction would be undetectable, and hence would not affect turtle behavior.

The shoreline bordering the property is sand, and it is possible that turtles could haul ashore. While it has not been documented that the area serves as a turtle nesting ground, such activities are potentially possible.

Similarly, the beach presents the possibility as a haul out area for monk seals. Transplanted seals have been documented to frequent many areas in the high islands. As such, human intervention to endangered species populations has resulted in increasing the potential for interactions between humans and the endangered species. As a result, it appears that the Kapalawai area has the same potential for monk seal habitation as any other beach locale on Kauai.

In summary, the potential for impacts to marine communities as a result of development of the Kapalawai Resort appear to be minimal or nonexistent. None of the developmental activities appear to have the potential to induce long-term changes in physic-chemical water quality parameters of a magnitude sufficient to cause changes in biological community structure. The marine environments off Kapalawai appear to have been subjected to substantial sediment stresses for a sufficient period of time (many decades) to have influenced community structure. Such stresses are much more destructive than the small temporary changes that

could result from construction of the proposed development activity. If some unexpected event related to development activities does occur, the resulting alterations to marine community structure would be reversible and recovery rapid once the stress factor is mitigated. Tolerance to such changes appears to already be part of the physiological range of the community.

Mitigation

In order to ensure that land use activities do not alter behavior of green sea turtles or monk seals that haul out, it is recommended that project lighting in areas near the shoreline be designed so as not to illuminate the beach strand. In addition, employees of the resort, and its guests should be educated about possible interaction with these animals, and appropriate human behavior for that interaction. For employees, this information could be included in training sessions, materials, and handouts. For guests, information, in the form of brochures, could be placed in all cottages, and signage in strategic locations on the property may also be appropriate.

It can also be concluded that as long as reasonable steps (best management practices; see Section 6.4, Grading and Drainage) are taken during construction periods, and because operational procedures for the project do not involve substantial changes in material delivery to the nearshore ocean, there should be no adverse impacts to the marine environment.

4.9 Historic, Cultural and Archaeological Resources

Existing Conditions

General Regional Background. Written historical accounts of Hawaii began when Captain James Cook anchored offshore from Waimea, Kauai on January 20, 1778. Prior to Cook's landing at Waimea, Hawaiians inhabited the region for hundreds of years. Since 1778, Waimea has had a major role in the island's history, being at one time Kauai's port of entry and focal point for economic activity (County of Kauai, 1977).

Waimea's history also includes the influence of the Russians and the construction of Fort Elizabeth in 1817, about ½ mile northwest of the project site.

Missionaries began arriving in Waimea during the 1820's while whaling was, at the same time, becoming an important industry in the islands. By the 1840's,

whaling reached its peak, and Waimea had become a port of entry comparable to Honolulu Harbor (County of Kauai, 1977).

It was not until the 1880's that the sugar industry was brought to Waimea. Sugar marked the start of a new era for the region. Population and employment increased and a long-term economic base was established (County of Kauai, 1977). It was during this era that ancestors of the Robinson family first arrived in Hawaii. Eliza Sinclair, native of Scotland and widow of Captain Francis Sinclair, arrived in Hawaii by way of New Zealand in September 1863, along with many of her children and grandchildren. After many months of looking for appropriate land, the family accepted the king's offer to sell Niihau: "After my brothers had investigated the place they were so enthusiastic that we accepted the King's offer, and...we bought the island of Niihau off the coast of Kauai" (Von Holt, 1985).

In subsequent years, the family purchased land at Makaweli, Kauai (in 1865), establishing a residence at the 1,800 foot elevation "...and a little later built what is still known as the Makaweli House. The altitude, eighteen hundred feet, the lovely forest, hills and valleys, the flowers, especially roses, all over the veranda and porch, reminded Anne poignantly of the old Craigforth House in New Zealand. Grandmama, who disliked the heat on Niihau during the summer, always felt Makaweli was her true home" (Von Holt, 1985).

It was soon thereafter that the house at Kapalawai was constructed in approximately 1897 for Aubrey Robinson, the grandson of Eliza Sinclair. The family used the Kapalawai property not only as a residence. Horses, cattle, and dairy cows were raised at Kapalawai, in addition to fruits and vegetables in the gardens and orchards around the house. Fish were plentiful in the fishpond.

Throughout this period, and up to the present, the Robinson family has been active in ranching and the sugar industry in Makaweli, recently expanding their sugar holdings with the purchase of the assets of Olokele Sugar Company.

Archaeological Inventory Survey. A draft An archaeological inventory survey has been prepared for the project site by Cultural Surveys Hawaii and is attached as Appendix D. This report has been ~~submitted to~~ accepted by the Department of Land and Natural Resources, Historic Preservation Division ~~for review~~. A summary of the draft survey is presented below. In addition, interviews with knowledgeable individuals were conducted for the purpose of identifying and

evaluating historic properties in conjunction with a study on cultural impacts
(Section 5.4)

Within the project area ~~five~~ six sites were identified and recorded with the State Historic Preservation Division (SHPD). Three of these were single feature sites, and ~~two~~ three were multiple feature sites. Each of these sites is generally described below, and located on Figure 14.

Site #50-30-9-762. This site consists of a series of rock walls and a terrace located in the northwest section of the project site, situated in and around the plantation-era homes. Two of the walls line the main driveway (Features A and B). Feature A also acts as part of the western property boundary. One wall follows an old government road (Feature C). Another wall intersects with Feature A and continues makai as the western property boundary. There are several wall segments in the plantation camp area that partition house lots. The terrace is mauka of the houses in the camp area (Feature F).

Site #50-30-9-763. Site 763 is a large oval platform measuring 155 feet long north to south by 73 feet wide east to west. This feature consists of *pahoehoe* cobbles and boulders of varying diameter (2" to 3.2'). The surface of the platform is relatively even with five distinguishing characteristics: (1) a ridge down the middle; (2) and (3) two paved depressions; (4) a mound; and (5) a square pit. Large boulders are found around the perimeter of the site with small boulders and cobbles found mainly on the upper surface. There are several kiawe trees growing within the site's perimeter, and some deadfall trees over the surface. The configuration of the platform and the pattern of boulder placement suggests that this structure has clearly been modified or altered, or entirely constructed during the historic period as a mound of cleared rocks. Testimonies given by individuals familiar with the property describe the platform as a clearing pile. However, it does possess some other characteristics that suggest portions of the rock platform may be of indigenous construction and use.

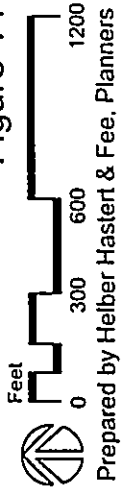
Site #50-30-9-764. This site is described as the main house complex, and is comprised of ~~six~~ 14 separate structures, each identified as a feature of the site: (A) the main house; (B) the guest house; (C) servants quarters; (D) the carriage house; (E) the saddle house; and (F) the plant house; (G) through (N) eight employee dwellings. The main house and all buildings associated with the main house were surveyed by Mason Architects. Their complete report, which has been accepted by the State Historic Preservation Division (Hibbard, October 6, 1999), is attached as Appendix E. This site is situated in the northern quadrant of



Historic Sites / Trench Excavations

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 14



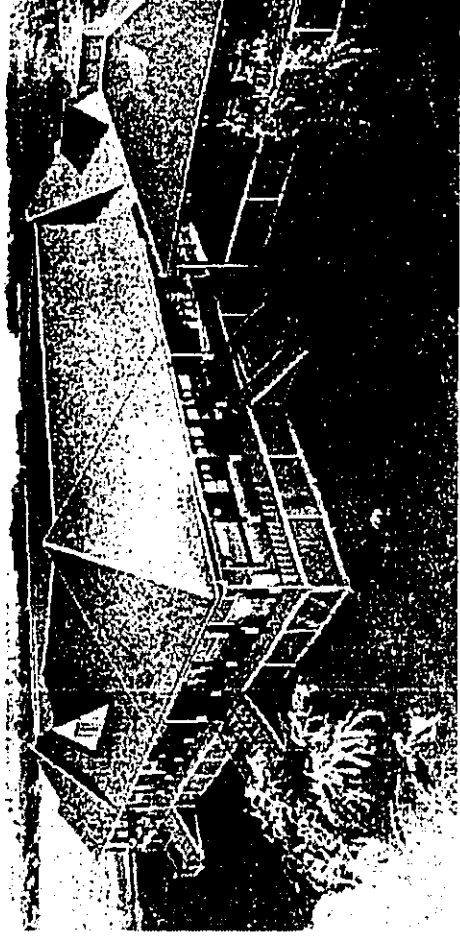
the project area, and is fenced protecting the grounds from the cattle pasture which encompasses the rest of the property. The grounds are maintained, and several of the structures are in use today, while others are in disrepair.

Feature 764/A. This feature is the former residence for the Robinson family, and was constructed in 1897 (Figure 15). It is basically a square house in plan view measuring 125 feet by 125 feet, with an open courtyard in the center. Added to these dimensions are a bedroom wing off the eastern corner of the house and living quarters and a large kitchen off the western side of the house. The front lanai has a view of the ocean to the southwest through an open space corridor that is intended to be kept clear of obstructions as stipulated by family documents. The house is in good condition and contains many original furnishings, and is slated for renovation and use as a museum. The original sections of Feature 764A, the main house, are basically unaltered. Later additions to the house have left the original sections intact. The house is an example of the Queen Anne style, which is a sub-type of the Victorian style, typical of the turn-of-the-century period. The architects of the house, C.P. Ripley and Arthur Reynolds, were prominent during that period in Hawaii. The Queen Anne style utilized details such as hipped roofs with gables, turned porch columns, bead decorative elements, patterned shingles and scroll-like elements at the gables, pent roofs enclosing the gable, brackets to accentuate overhangs, and full-width porches, all used at this house. The house design is unique in its modification for the local climate and lifestyle by including a central courtyard and continuous deep lanais around the courtyard and the building exterior. The lanai area is so extensive that it makes up more than half of the total floor area of the house.

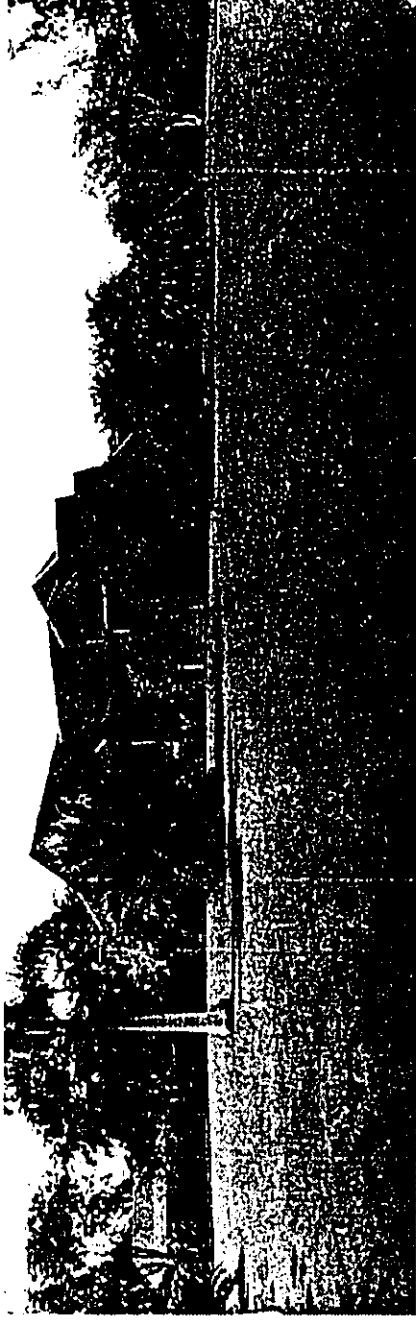
Feature 764/B. Feature 764/B was originally constructed as a guest house (Figure 16). It is a wooden structure built off the west corner of the main residence, and is detached from it. This house faces the southeast. It is in good condition and is presently used as an employee residence.

Feature 764/C. This feature is a single wooden structure that was built off the northwest side of the main house. It was formerly used as the servants' quarters. It has been converted into office space and is currently used as such (Figure 17). This structure is in good condition.

Feature 764/D. Feature 764/D is a large two-story wooden structure constructed north of the servants' quarters (Figure 18). Originally, the building was used as a carriage house. Today, it houses several older vintage automobiles previously



View of family house toward Pakala taken soon after completion (c.1897).



View of front lawn of house, with guest cottage at left (c.1920).

Robinson Family Dwelling (Site 50-30-9-764A)

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii

Source: Robinson Family Archives

Prepared by Helber Hastert & Fee, Planners

Figure 15



Front view of guest house taken from front lawn of main house (c. 1920).

Former Guest House (Site 50-30-9-764B)

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii

Source: Robinson Family Archives

Prepared by Helber Hastert & Fee, Planners

Figure 16



View of former servants quarters (recently taken), now used as office for Robinson Family Partners.

Robinson Family Partners Office (Site 50-30-9-764C)

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 17

Source: Helber Hastert & Fee

Prepared by Helber Hastert & Fee, Planners



View of former carriage house recently taken. Note disrepaired state of structure.

Former Carriage House (Site 50-30-9-764D)

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii

Source: Helber Hastert & Fee

Prepared by Helber Hastert & Fee, Planners

Figure 18

used by the family. Presently, the entire building is leaning; a significant portion of the roof is gone, and the staircase to the second floor has collapsed.

Feature 764/E. This feature is currently only a remnant. It was formerly the saddle house. This structure was attached to the eastern side of the carriage house. The floor and foundation are all that remain intact. Presently, on the floor surface is the wood from the walls and roof intermixed with equestrian tools.

Feature 764/F. Feature 764/F is a vacant plant house in poor condition. The structure is rectangular and made of wood. The dirt floor has been excavated about three feet below the ground surface. The walls of the excavated portion are lined mostly with hollow tile, but also basalt boulders. The hollow tile might have been a later addition. The steps at the entrance are cut basalt. The roof is damaged.

Feature 764/G through N. These features comprise eight houses located approximately 500 feet northwest of the main house. These structures were built as housing for employees of the Robinson Family. Earlier houses were located in the same or approximately the same area as the existing houses. A 1912 USGS map and a 1930's-era aerial photograph show buildings in about the same location as the existing housing. Gay and Robinson, Inc. tax records indicate that two of the houses were rebuilt in 1953, and two others were rebuilt in 1954.

The design and materials of the eight houses are so similar that it is nearly certain that they were all constructed close together in time. They are nearly identical, varying slightly in layout or size. There appears to be two different floor plans, with either three or four bedrooms. The houses are rectangular in plan, with wood post and beam foundations and vertical wood tongue and groove (T & G) exterior siding. The houses have received little renovation and generally retain their original layouts, materials and character. The houses appear to generally be in good condition, with little termite or other damage.

Site #50-30-9-765. Site 765 is a 6.5-acre inland fishpond. This site is a large enclosure constructed of *pahoehoe* cobbles and boulders to 2.5 feet in diameter which form a wall surrounding the fishpond. The wall is discontinuous. Some areas of the perimeter have been disturbed by cattle. Other spots have vegetation covering, or trees fallen over the perimeter wall.

This fishpond is classified as a *pu'uone* type pond. A *pu'uone* is created by the formation of a barrier sand berm that isolates the pond from the sea. This is a

very common type of pond in the coastal zone of the major islands in the Hawaiian chain. On Kauai, this is the type of pond most frequently used as a fishpond. Most *pu'uone* have freshwater spring sources, a feature which converts them into an almost freshwater pool termed *lokowai*. (Kikuchi, 1999) In addition to the wall constructed around the perimeter, there is a wall which transects the width of the pond at its makai end, essentially splitting the pond into two unequal parts (Figure 19). This wall, which is approximately 19 feet across and 352 feet long, is constructed of the same materials as the perimeter wall.

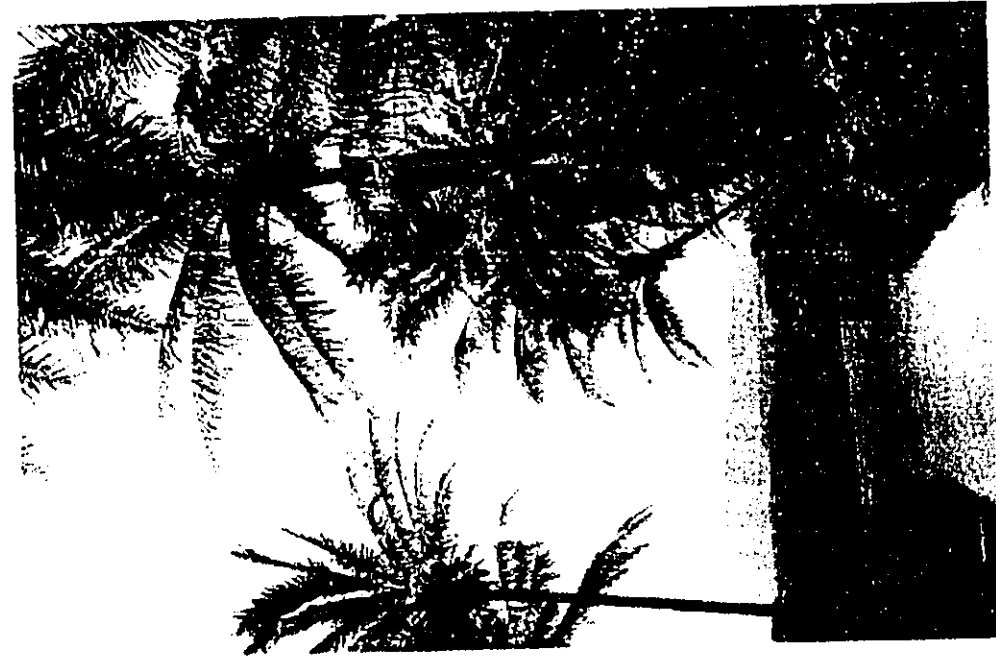
There have been a number of historic modifications to the pond. A gate at the southern end is made of concrete. At the mauka terminus of the pond, a pump house was built on a concrete slab. This structure is made from corrugated metal. Inside there is a combustion engine pump attached to a 6-inch cast iron pipe. Water was pumped from the pond for use on the rest of the property.

At the present time, the pond has large deposits of silt accumulated, and there are dense concentrations of vegetation throughout. Although the pond appears to have been used for fish farming in the past, it is not now in a state to support fish farming, and exhibits extensive historic modification.

The only known story relating to the fishpond centers around a *mo'o wahine* (a fresh water mermaid with the ability to change into a partially human form) who is said to reside in the pond. Legend has it that she can be seen in the early mornings sitting on a particular *pohaku* (rock) just before sunrise. The stone was described as being flat and oblong in shape. It used to lie about a foot under water, near the pond's northeast edge. There is also a particular monkeypod tree and coconut tree which mark the spot where the *pohaku* is said to have been. While the name of the *mo'o wahine* is not known, it is probable that there is an older name for the pond which relates to the legend in some way.

Site #50-30-9-766. This site is a mortared stone and brick structure commonly referred to as a "Portugese Oven." Immigrants from Portugal introduced this type of wood-fired outdoor oven to Hawaii. This structure is clearly of historic origin, and is in very good condition.

Site #50-30-9-972. This site consists of two features. Feature A is a subsurface cultural layer that contains the remains of prehistoric habitation and other activities. The layer contains traditional Hawaiian food remains, including mammal and fish bone and marine shell, charcoal from combustion features, and



View of fishpond looking mauka (c. 1920). The berm separating the two sections of the fishpond is seen in the foreground. Note abundance of open water.



Recent view looking across fishpond. Note growth of vegetation.

Fishpond at Kapalawai

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii

Figure 19

Source: Robinson Family Archives,
Helber Hastert & Fee

Prepared by Helber Hastert & Fee, Planners

artifacts such as basalt flakes and volcanic glass. The site also contains numerous intrusive features that extend from the cultural layer into the underlying, culturally sterile, beach sand. These features are the result of Hawaiian excavations for many purposes, including hearths, earth-ovens, and structural supports such as post holes. This feature was located and documented during the backhoe subsurface testing of the project area (see "Test Excavations," below). Backhoe trenches 5, 6, 14 and 23 cut through this layer and exposed it in profile. This layer is generally 12 to 16 inches thick, but is up to 4.3 feet thick in some areas.

Feature B contains what is most likely a prehistoric human burial, and is associated with the cultural layer at Feature A. It was found in backhoe trench 23 approximately 4-6 feet below the surface ground elevation. Based on the general context of the burial (an unmarked burial in coastal sand deposits, with no apparent historic artifacts in association, within what is most likely a prehistoric cultural deposit) it is more likely that the burial is pre-historic/early Historic Native Hawaiian. After observation and recordation, the trench was backfilled. Appropriate State Historic Preservation officials (Burials Program and Kauai archaeologist) were notified of the burial find.

Test Excavations. Subsurface testing was performed in and around Site #50-30-9-763, and at the juncture of the Mahaikona Stream and the shoreline. Three test units were excavated on the surface of Site #50-30-9-763. Test Units 1, 2, and 3 did not yield midden, charcoal, or artifacts of any kind. Test Unit 2 was excavated into the mounded ridge extending down the center of the platform. The results of Test Unit 2 indicate the paved surface of the platform is continuous and that the ridge postdates the construction of the surface of the platform. Five shovel test pits were placed around the perimeter of the platform to look for cultural deposits. None were found. The findings indicate a sterile environment in and around the platform. A single test unit was excavated above the west bank of Mahaikona Stream where the vegetation begins behind the beach. This test unit location (#4) was chosen as a likely spot for pre-contact occupation because of its proximity to the ocean and perennial stream. In addition to Test Unit 4, the west bank of Mahaikona Stream where it cuts through the beach was examined. Neither Test Unit 4, nor the shovel exploration of the stream bank yielded any evidence to support pre-contact occupation at this location.

Background research revealed a substantial amount of historic modification to the project area for the purpose of ranching. Field observations confirmed that the project area has been utilized for ranching, and residential habitation.

A total of 23 backhoe trenches were excavated and documented. Trench locations are shown on Figure 14. The majority of trenches were excavated in sandy coastal deposits. As expected, sediments in the makai portion of the project area are predominately calcareous beach sand. Only in the area immediately around the fishpond were substantial terrigenous sediments found. No evidence of prehistoric/traditional Hawaiian subsurface deposits was found in terrigenous sediments. Evidence of massive historic earth moving was found in Trench 10, where an artificial berm was created along the northern boundary of the Fishpond.

Loam and sandy loam terrigenous sediments appear to have been deposited discontinuously over many portions of the project area. Based on field observations these deposits are most likely recent historic or modern and related to land clearance or earth movement. An apparently historic or modern sandy loam deposit was often observed immediately above the older, now buried sand A-horizon.

Beside the historic fill layers documented in Trench 10, subsurface evidence of cultural activity was documented in three locations during the backhoe testing. Two of these locations, Trenches 3 and 7, consisted of discontinuous cultural deposits, charcoal flecking and marine shell, in pit-features. The cultural deposits in Trenches 3 and 7 are most likely historic and were not assigned State site numbers.

The third location consisted of the extensive prehistoric/traditional-Hawaiian cultural layer that was documented and sampled in Trenches 5, 6, 14, and 23 at the project area's west end. A most likely prehistoric/early historic Native Hawaiian burial was located in association with this cultural layer.

The backhoe testing adequately sampled the makai portions of the project area for subsurface cultural deposits. The mauka portion of the parcel was not sampled with backhoe trenches based on observations made during the pedestrian inspection of this region. These observations indicated little likelihood of buried cultural deposits in the project area's mauka terrigenous sediments.

In addition to the terrestrial test excavations, one 220 cm long core sample was taken from the middle of the pond, in an attempt to date the pond by paleoecological methodologies. From this sample, it has been suggested that the pond began as a natural basin subject to marine overwash, followed by modification by prehistoric Hawaiians to minimize marine influence, which was followed by a swamp-forest stage with periods of increased erosion into the pond

concluded by last phase of organic sedimentation reflecting recent overgrowth of the pond by aquatic vegetation (Shideler, October, 1999).

A drupe (seed) from a hala fruit (Pandanus tectorius) was extracted at a depth of about 170 cm. (Kikuchi, 1999). Subsequent Carbon¹⁴ dating indicated a date between AD 895 and 1225 for the drupe. While dating the drupe to this period does not definitely date the fishpond, it does provide a window to establishing an approximate period for the fishpond. This would seem to correspond to the time of initial modification of the natural basin by prehistoric Hawaiians to minimize marine influence or effectively to the creation of the fishpond. This date is consistent with other carbon dating from Kauai which suggests a substantial expansion of human settlement in the latter portion of the posited Kauai island "Developmental Period from AD 600 to 1400. The time frame from AD 1150 to 1400 seems to have been a time of pronounced population increase, settlement and agricultural/aquacultural expansion on Kauai (Shideler, 1999).

Site Significance. Site significance was evaluated using five broad criteria defined by the State of Hawaii and National Registers of Historic Places (Chapter 6E-10 and 6E-5.5, Hawaii Revised Statutes). A cultural site is determined to be significant if the:

- A. Site reflects major trends or events in the prehistory of the state of nation.
- B. Site is associated with the lives of persons significant in our past.
- C. Site is excellent example of a site type.
- D. Site has yielded or is likely to yield information important to prehistory or history.
- E. Site has traditional cultural significance to an ethnic group.

Site #50-30-9-762. This is a multiple feature site composed of six features (A-E) which include a series of rock walls plus one terrace. The walls are difficult to date, but the property boundary wall features besides defining property limits, appear to have been constructed to provide a certain amount of privacy to the landowner. The smaller camp wall features and terrace seem customized for use in and around the camp. The complex of walls are assessed under criterion 'D' only.

The remaining walls help to define the boundaries of the property. They are integral to the property design. Preservation is recommended to the extent possible within the confines of the proposed plans. No further research is recommended.

Site #50-30-9-763. This platform has a relatively even surface that slopes from its high end at the south downward to the north. There are five identifying characteristics on the surface of the platform: two linear paved depressions; a mounded ridge extending down the center; an oval mound; and a constructed pit. A total of 8 test units were excavated in and around the structure. Testing revealed no cultural materials of any kind. Testing also revealed the structure had been modified through multiple phases of construction. The surface is relatively even, and its construction required substantial time and effort. Based on these observations it is assessed as historically significant under criterion 'D.'

Based on the amount of time taken to construct, and the effort taken to pave the surface of the platform, the recommendation is preservation, with no buffer zone.

Site #50-30-9-764. This site consists of six 14 historic structures (Features A to ~~F~~ N) which include: three living quarters, a garage, a collapsed saddle house, and a greenhouse, and eight employee houses.

The house is considered significant under Criteria C, as it embodies distinctive characteristics of a type and period, and possesses high artistic values. The house is also significant under Criteria B, as it is associated with the Robinson family, who are important in the history of the islands of Kauai, and Niihau, and the state of Hawaii. The house is the primary structure at the site, and is the most significant feature there. The bedroom wing, although a later addition, has been part of the house complex for more than 50 years, and has developed significance as part of the complex. It was built using the same materials and style as the main house and blends well architecturally.

The main house and attached kitchen and bedroom wings shall be preserved as much as possible, particularly on the exterior. Damaged architectural materials shall be restored using material types and sizes to match the original.

Feature B, the guest house, has been an integral part of the property since the earliest historic-period construction on the site, and served an important role as guest quarters for visitors to this then-remote location. Although there are a few additions to the structure, most of these are attached only at the roof, and do not affect the historic fabric of the structure. These additions could easily be removed. The building has been used for the same general purpose since its construction and is a relatively unaltered historic structure, with construction materials and style representative of its period. It has played an important role in the history of, and activity at, this property. It is a significant part of the Kapalawai complex. This

building is significant under Criteria B and C, as part of the complex which is associated with the Robinson family, which further embodies the distinctive characteristics of a period of construction, and as part of a significant and distinguishable entity (the house and complex at the site).

The cottage will most likely be used for administrative space. The exterior of the building will be restored, including repair or replacement of all damaged material, and removal of the non-historical additions. This work will increase the historic integrity of this structures.

Feature C, the building used as office space by Robinson Family Partners, is significant as a relatively intact historic structure that played an integral role in life at the Kapalawai complex. It has been part of the property since the earliest historic-period construction on the site, and has been in continuous use as part of the property since construction. This building, as well as an the associated tack and storage buildings, are significant under Criteria B and C, as part of the complex which is associated with the Robinson family, which embody the distinctive characteristics of a period of construction, and as part of a significant and distinguishable entity (the house and complex at the site).

The office building will continue to be used for that purpose. The tack and storage portion on the mauka side of the building will cleaned and repaired. It is possible that an adjacent structure or addition to the office building will be constructed to serve as a reception area for arriving guests; if this occurs, it will be designed to conform to the U.S. Secretary of the Interior's Standards for additions to historic buildings and for new construction adjacent to historic buildings.

Feature D, the garage, has significance due to its age and essential role it served at the site, The front elevation has been altered somewhat from its original appearance by the replacement of the lower portion of the wall with the doors, and the removal of an awning roof. The changes in the structure reflect the changes in the type of activities and mode of transportation available throughout the history of the site. The building appears to be structurally unsound and in very poor condition. Additional investigation of the stability and condition of the building will be done to determine if it can be saved. If it is demolished, the plant growth should be cleared off the structure as much as possible, and the building should be photographically documented, using equipment and materials that meet the U.S. Secretary of the Interior's Standards for documentation. The tack shed (Feature E) is a ruin, and will be removed.

Feature F, a vacant greenhouse, has certainly been present at the site for many years, and has significance as a structure continuously used for the same general purpose since its construction. However, due to its poor condition, like the garage buildings, repairs needed would require so much reconstruction that very little historic material would remain, diminishing much of the building's historical integrity.

Current plans do not include the restoration or the development of the garden area. This building will be demolished due to its poor condition. Prior to demolition, the plant growth should be cleared from the structure as much as possible, and the building should be photographically documented, using equipment and materials that meet the U.S. Secretary of the Interior's Standard's for documentation.

At least four, and possibly all of the houses, are not yet 50 years old, which is the minimum age for properties to generally be considered as significant under National Register Criteria. However, these structures have been part of the property for at least 45 years, and have served an important role as housing for employees of the Robinson Family. The buildings have been used for the same general purpose as the houses they replaced at the same location. The buildings are relatively unaltered structures, with construction materials and styles representative of their construction period. The houses are significant as a group of related structures that have played an important role in the history of, and activity at, the Kapalawai complex.

Site #50-30-9-792. Site 50-30-9-792 consists of subsurface cultural deposits containing the charcoal-enriched sediments, pit-features, artifacts, and midden associated with prehistoric or early historic traditional-Hawaiian occupation. The site is significant under Criterion D of the State and National Registers of Historic Places for its information content regarding traditional-Hawaiian coastal habitation in this portion of Kauai. The age and ethnicity of the human burial associated with the cultural layer (Feature B), based on the available evidence, is most likely a prehistoric or early historic Native-Hawaiian. Accordingly, the site also has traditional cultural significance to Native Hawaiians and is significant under Criterion E of the State and Register of Historic Places.

Other Structures. Other structures in the vicinity of the main house include a water tank, wash house structures, and three sheds. The water tank has been present at the site for a long time, and certainly served an important function during the days of its use. However, the structure is now in such poor condition, and has lost so much of its original material, that it retains little historic integrity. The

structure will most likely remain as a ruin, unless final plans show development in this area.

The wash house structures do not have enough historic material remaining to be significant. The three sheds have little significance due to their minor roles at the site. One shed, which is wood-sided, in the garden area, can continue to be used as storage for grounds maintenance. The other two sheds will be demolished.

Probable Impacts

Many of the structural historic sites identified on the project site will be retained and efforts will be made to restore them. Buildings in this category include: the former Robinson family residence (Site 764A); the former guest house (Site 764B); and the former servants quarters (current offices for Robinson Family Partners) (764C). Other structures will be demolished because they are in such poor condition. Buildings in this category include: the former carriage house/garage (Site 764D); the remnants of the former saddle house (Site 764E); and the former plant house (Site 764F). The eight employees houses (sites 764G through N) will continue to be used as housing for employees of the development or Gay & Robinson, Inc., continuing the historical use of the structures. Alterations will be limited to general repairs and maintenance whenever possible, with replacement construction occurring only when necessary when buildings cannot be rehabilitated.

The structures being retained have been surveyed to determine their condition and identify required repairs. All repairs will be implemented to match original materials and design to the greatest extent possible, so the exterior appearance of these buildings will remain intact.

A significant portion of the interior of the former residence (existing dining, sitting, library, pantry, china, linen rooms, as well as one guest bedroom and the original kitchen building) will be maintained as museum space, and will be repaired and restored to match original materials and design. The remainder of the main house will undergo the most interior renovations. Within the two guest chambers with bathrooms at the front of the house, all interior walls and fixtures will be removed and a lounge bar will be constructed. Most of the interior walls in the east section of the house will be removed to create space for men's and women's restrooms and meeting rooms. The interior walls in the attached bedroom wing will be removed to create another meeting room.

All existing painted surfaces will be repainted. All papered walls will be repapered. Every effort will be made to restore the existing wallpaper. If evidence of original wallpaper cannot be found, it will be replaced with appropriate period wallpaper.

The fishpond will be cleared of exotic vegetation and restored to an appearance similar to that in the latter part of the 19th century and the first half of the 20th century. The exact method of pond clearance has not been determined, so impacts to the pond are difficult to determine at this time, and it is not known what type of heavy equipment will be required, if at all. If large heavy-equipment vehicles are needed, they could possibly impact the extant pond rock walls, if the full weight of the vehicles is brought to bear on the walls.

Three other historic sites, the Portuguese Oven (Site 766), the platform (Site 763), and a series of rock walls and terrace (Site 762) will be preserved as-is and integrated into the site design of the project.

The discovery of a human burial in the property's sandy coastal deposits is hardly surprising. It is possible that as yet undiscovered human burial remains may be located within the project area's sandy deposits.

Mitigation

Appropriate actions should be implemented to ensure protection of extant fishpond walls during any activity to clean out the fishpond. These actions should be reviewed by the DLNR SHPD prior to commencement of any such activity. Additionally, there is a pohaku (rock) in the fish pond associated with a mo'o wahine legend, which could not be found due to vegetation and debris. It is recommended that before restoration work on the fishpond begins, this pohaku should be located and preserved in place.

The Portuguese Oven should be clearly marked with an appropriate buffer area to prevent accidental damage during construction.

A mitigation plan will be prepared and implemented for all historic properties identified in the project area. This plan will include interim mitigation measures to protect historic properties during construction and development related activities. In addition, a long-term preservation plan and interpretive plan will be prepared.

The three buildings associated with the residence that are to be demolished (764D: Carriage House/Garage; 764E: Tack Room; and 764F: Greenhouse) should be photographically documented.

Feature 762G (iron try-pot) is recommended for preservation, with the construction of a moderate roof structure to shelter it from the weather.

Oral interviews suggested Site 763 (Rock Platform) was used as a clearing mound in the 1940's. However, due to some remaining uncertainty regarding the function of this highly anomalous site, it is recommended for preservation with no buffers.

Site 792, (Traditional-Hawaiian Cultural Layer and Burial) are recommended for preservation through the establishment of an archaeological and burial preserve area. Two mitigation steps will be required to establish this preserve area:

(1) Cultural Layer Preservation Plan

Feature 50-30-9-792/A, the cultural layer, is recommended for preservation for future archaeological research. The preservation plan will outline the short-term and long-term preservation measures that will safeguard the feature from damage during project construction and subsequent land use. Recommended short term preservation measures include:

- a) a preconstruction meeting with the project construction personnel to make them aware of the location and significance of the preserve area;
- b) surveying the preserve area boundaries by professional land surveyors so the correct dimensions of the preserve area can be plotted on all project development maps. No construction or other land disturbance should take place within this preserve area; and
- c) the erection of temporary 4-foot high plastic event fencing during construction along the preserve area boundary to make the boundary highly visible to machine operators. This fencing can be removed once construction is completed.

Long term preservation measures should protect the site for future research. These include keeping the preserve area free of ground disturbance such as construction, excavation, or major landscaping, such as tree planting. Simple landscaping, such as a grass lawn, should be installed to cover and protect it from erosion and

pedestrian traffic. Once adequately protected by a lawn covering the preserve area need not be closed off from public access. No fencing or other demarcation of the preserve area is recommended, as this will only draw undue attention to the area.

(2) Burial Preservation Plan

Feature 50-30-9-792/B, the human burial, is recommended for preservation in place within the combination archaeological and burial preserve area. The preservation of the burial will require the preparation of a burial treatment plan. As a previously recorded burial site (so designated because it was found during inventory survey investigations) the mitigation and treatment of these skeletal remains fall under the jurisdiction of the Kauai Island Burial Council, who must approve all mitigation and/or treatment measures. The request for preservation in place must be presented to the Burial Council in the form of the burial treatment plan. The requirements for a burial treatment plan are clearly outlined in Chapter 13-300, Hawaii Administrative rules "Rules of Practice and Procedure Relating to Burial Sites and Human Remains". Along with other information the burial treatment plan must include:

- a) Evidence of good faith search for lineal and cultural descendants, including legal advertising;
- b) Names of known lineal or cultural descendants recommended by the SHPD Burials Program and recognized by the Burial Council; and
- c) A description of proposed treatment of all burial sites including a statement of preservation in place or relocation. This should include both short and long term measures, which would be very similar to the measures given above for the archaeological site preservation plan.

Both the preservation plan and the burial treatment plan will be written, approved by SHPD (preservation plan) and the Kauai Island Burial Council (burial treatment plan), and implemented, before development of the parcel can begin.

Finally, archaeological monitoring will be required during construction. Subsurface testing results indicate that two site or feature types will potentially be found during ground disturbance: human-burials and subsurface prehistoric cultural layers. These site/feature types are much more likely to be found in the project area's sand deposits along the coast. Accordingly, archaeological monitoring is recommended for all portions of the project area containing sand deposits. Before

construction begins a monitoring plan should be written, approved by SHPD, and implemented.

It is recommended that the monitoring plan include provisions for the documentation of inadvertently discovered prehistoric cultural deposits. Documentation of features should include plotting their location on the overall project area map, profile drawings, descriptions of their stratigraphic context, descriptions of the feature's contents, and, if possible, samples for radiocarbon dating analysis. The monitoring plan should contain provisions for the analysis of these samples, if they are encountered. If available this information would provide better understanding of the prehistoric coastal occupation in the region.

In consultation with DLNR/SHPD and the Kauai Island Burial Council it may be possible to combine the burial treatment and preservation plans for Site 50-30-9-792 with the monitoring plan for the entire parcel into a comprehensive historic preservation mitigation document.

4.10 Scenic Resources

Existing Conditions

The physical ambience of West Kauai is characterized by its rural nature, dominated by open space and the presence of sugar cane. Sugar cane has been a dominant visual condition in West Kauai for many decades. Recently, other agricultural crops have been introduced in the region, most notably coffee on former sugar lands near Eleele, and experimental corn in Makaweli. The dominant colors of the region are influenced by the bright blues of sky and ocean, the vibrant greens of agricultural fields, and the reds and browns of the soil. Development in the region is decidedly low-rise in nature, and plantation-era in style, including the two main towns of Hanapepe and Waimea.

Driving along Kaunualii Highway in either direction, motorists enjoy periodic views of the ocean and the mountains, depending on topography and vegetation immediately adjacent to the highway. The project site has approximately one mile of frontage along Kaunualii Highway. Views into the project site are transitory at the southern end of the property near the bridge that spans the Aakukui Stream, and near a secondary dirt access road about ¼ mile north of Aakukui Stream. At no time is the shoreline visible from the highway. Otherwise, views toward the property are interrupted by dense, tall thickets of bougainvillea and other trees. The bougainvillea provide a spectacular array of color, when the bushes bloom in a

beautiful splash of colors. Tourists are often seen stopping their cars and posing for pictures using the bougainvillea as a backdrop.

After passing the property travelling in a northwesterly direction, vistas toward the ocean are restored as agricultural fields once again provide a clearer view of the shoreline area.

Probable Impacts

The interior of the project site is not currently visible from Kaunualii Highway because of the dense vegetation on the mauka portion of the property. Consequently, development of the proposed resort will not be visible from the highway.

The existing entry drive into the property will be formalized for the resort, thereby undergoing some modification, including the installation of a left-turn storage lane on the Waimea-bound side of Kaunualii Highway, and a right-turn deceleration lane on the Hanapepe-bound side of the highway. In addition, a new exit drive for the property will be created about 500 feet on the Hanapepe side of the entry drive.

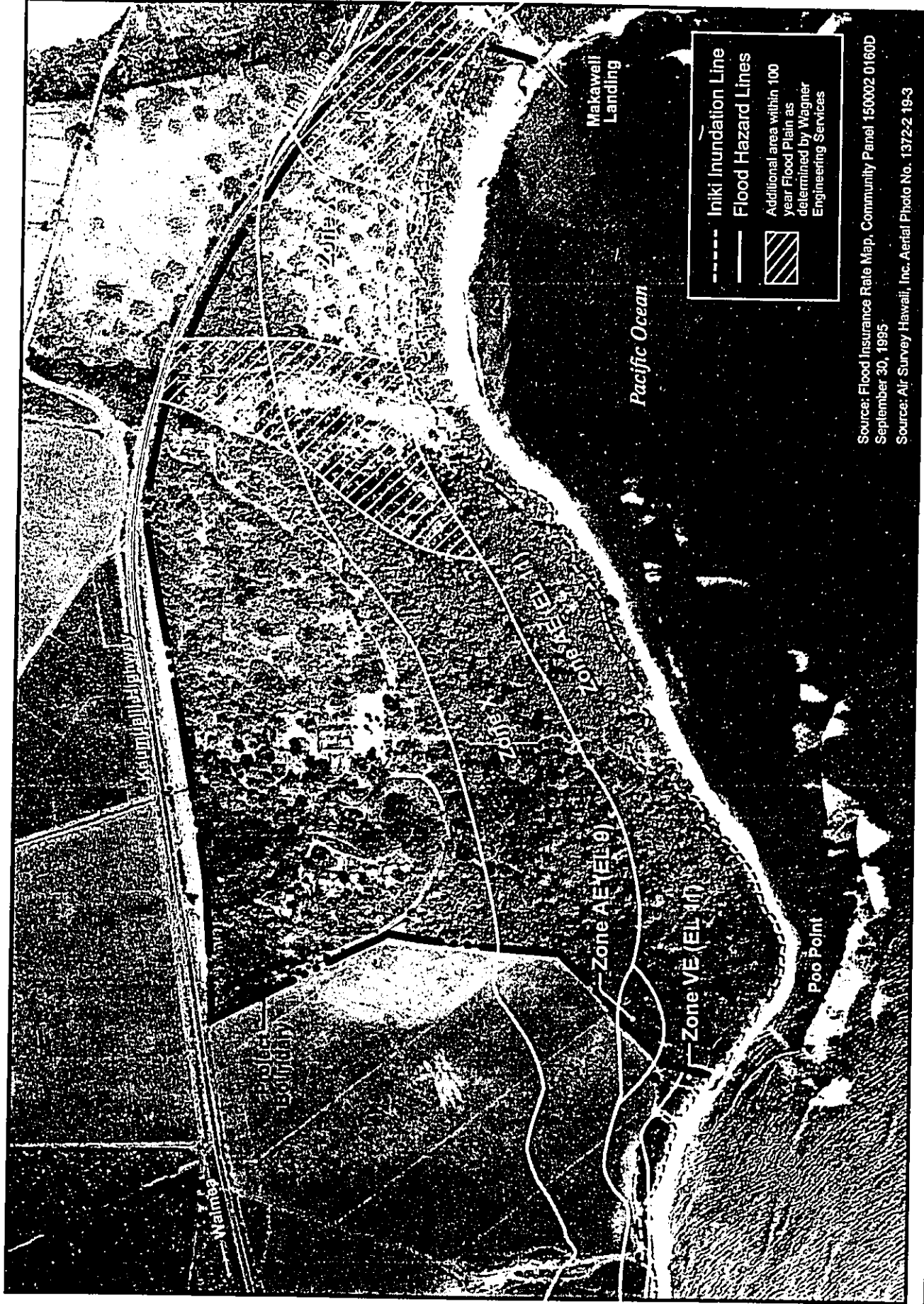
Mitigation

Appropriate signage and landscaping is recommended for both the entry and exit drives to the Kapalawai Resort. These improvements should be kept in character with the region, and signage should be indirectly illuminated.

4.11 Flood Hazards

Existing Conditions

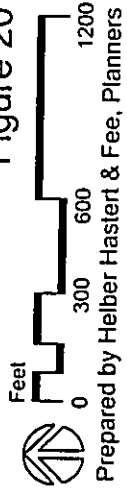
The 100-year floodplain is based on National Flood Insurance Rate Maps, where areas designated "AE" and "VE" are subject to inundation. Both these areas fall within "special flood hazard areas inundated by the 100-year flood." Both zones also have base flood elevations determined. As can be seen in Figure 20, an area along the makai portion of the property is within the AE zone, with a base flood elevation of 11 feet above mean sea level (AMSL). A smaller portion of the project site is affected by the AE zone, with base flood elevations of 9 feet AMSL. Another small portion of the property is affected by the VE zone, a coastal flood with wave velocity (tsunami). Base flood elevations in this area have been determined to be 11 feet AMSL. A band mauka of the AE zone has been designated "Zone X," which



Flood Hazards / Hurricane Iniki Inundation

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 20



indicates an area which is affected by the 100-year flood, but has flood depths of less than one foot.

Additional calculations conducted by Wagner Engineering Services indicate an expansion of areas affected by the 100-year flood adjacent to Mahaikona and Aakukui Streams. Base flood heights in the vicinity of Mahaikona Stream are 12 and 13 feet closer to Kaumualii Highway, and 11 feet adjacent to Aakukui Stream.

Hurricanes cause damage in several ways. Heavy rains and tornadoes can accompany strong winds and storm surges. Surges, intrusions of wind- and pressure-driven coastal waters above the tideline, are restricted to the first few hundred meters of the coastal zone, while winds impact entire islands. Figure 20 shows the extent of inland overwash of storm surge at Kapalawai (this line was determined by digitizing an aerial photograph of the project taken on September 18, 1992, 7 days after Hurricane Iniki struck Kauai, and tracing the debris line).

Probable Impacts

Many of the structures in the proposed Kapalawai Resort are affected by flood hazards in the AE and X zones, with flood elevations ranging from one to about five feet above existing grade. No structures are planned to be built within the area affected by the zone of inland overwash from the storm surge associated with Hurricane Iniki.

Mitigation

All affected structures will be constructed in compliance with flood hazard regulations, which require: (1) securely fastened columns to resist flotation, collapse, and lateral movement; and (2) certification by a registered professional engineer or architect.

4.12 Air Quality

Existing Conditions

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height, and rainfall all influence air quality.

Present air quality in the vicinity of the project area is affected by air pollutants from natural, vehicular, and agricultural sources.

Natural sources of air pollution which may affect the area but cannot be quantified accurately include the ocean (sea spray), plants (aero-allergens) and wind blown dust. In the case of the project site, wind blown dust could originate from agricultural fields adjacent (mauka and Waimea side) to the property. This particular pollutant would be affected by seasonal variations in factors affecting soil cover and moisture content (temperature, rainfall, wind speed and direction, and harvest schedule). Wind blown dust could also originate from within the project site.

Kaumualii Highway, which borders the project site, is the region's major arterial roadway, and as a result, is the source of exhaust from motor vehicles.

Agricultural operations in the area also affect air quality with the operation of the sugar mill at Kaumakani, approximately one mile east of the project site.

Probable Impacts

Short-term Impacts. The principal source of short-term air quality impacts associated with the proposed project will be construction activity, including construction vehicle emissions and particulate emissions connected with clearing, grubbing and other site preparation work, and construction equipment and workers traveling to and from the project site. Factors favoring good air quality in the vicinity of the project site include good exposure to tradewinds, and ample open space. Moreover, vehicular traffic flow along the section of Kaumualii Highway fronting the project site is relatively smooth, further enhancing air quality.

Factors contributing to less favorable air quality include low annual rainfall (about 21 inches), which creates dusty conditions, and good exposure to tradewinds.

Operational Impacts. Two sources of air quality impacts could result from the operation of the resort: (1) increased vehicle emissions due to increases in traffic volume; and (2) fugitive dust from disturbance of dry exposed soil.

After construction of the resort is completed, use of the proposed facilities will result in increased motor vehicle traffic on nearby roadways (from about 6% to

20%, depending on day and time of day; see Section 6.1). This could potentially cause long-term impacts on ambient air quality in the project vicinity.

The use of electric-powered vehicles by the resort will reduce on-site emissions.

Increases in vehicular emissions will probably not have a significant impact in the vicinity of the project site because traffic flow is smooth and normal wind patterns prevent the accumulation of emissions. In addition, the elimination of lead-based gasoline has eliminated this source of motor vehicle-created pollution.

Mitigation

Short-term Impacts. Compliance with State of Hawaii Air Pollution Control Regulations (Title II, Chapter 60.1, Hawaii Administrative Rules) will ensure reduction of fugitive dust related to construction activities. Reasonable precautions, or best management practices (BMPs) include:

- use of water on exposed soil (twice daily, if necessary);
- covering all moving, open-bodied trucks transporting materials which may result in fugitive dust;
- use of wind screens to prevent migration of fugitive dust, as appropriate;
- prompt removal of earth or other materials which have been temporarily stockpiled; and
- limiting the land area exposed by construction

Operational Impacts. Because of the dry nature of the climate in the region, fugitive dust will always be a concern. In order to minimize fugitive dust, care must be taken to avoid patches of exposed soil.

4.13 Noise

Existing Conditions

The ambient noise environment of this coastal project is influenced by the sounds of ocean waves and the wind rustling vegetation. In most locations on the project site, traffic noise from Kaunualii is not discernible. The cottages are proposed to be set back from the highway distances ranging from about 400 feet to about 2,500 feet.

Probable Impacts

Short-term Impacts. Development of the Kapalawai Resort will involve grubbing, grading, some excavation, and the construction of infrastructure, cottages, restaurants and other accessory facilities. Actual noise profiles generated by these activities will depend on the construction methods employed during each phase of the project. Typical ranges of construction equipment will range from less than 60 dBA for pumps and vibrators, to almost 100 dBA for jack hammers and rock drills. Earthmoving equipment, such as bulldozers and diesel powered trucks will probably be the loudest equipment used during construction.

The closest sensitive receptor is several hundred feet from the nearest point of construction activity, and there is a heavy growth of vegetation separating the areas. Therefore, sound from construction operations will be greatly attenuated before reaching any nearby dwellings. In addition, agricultural activity in the vicinity already includes the operation of heavy equipment and trucks. Therefore, noise impacts attributable to the construction period are expected to be minimal, and of a temporary nature (9-12 months).

Operational Period Impacts. Potential noise sources attributable to the operation of the proposed resort include:

- use of lawn mowers and other landscape maintenance tools;
- pumps associated with the wastewater treatment plant and irrigation systems;
and
- arrival and departure of supply, guest, and employee vehicles

Typical A-weighted noise levels at a 50-foot distance for the landscape equipment range from 74 dBA for a lawn mower to 82 dBA for a chain saw. The nearest noise sensitive areas would be residences located several hundred feet away. Due to the distance of separation, these noises should not be objectionable.

The pumps for the wastewater treatment plant and the irrigation system will be located within buildings, which will limit their impact. In addition, there are no sensitive receptors in the immediate vicinity. Therefore, no significant off-site noise impacts are anticipated related to on-site mechanical equipment.

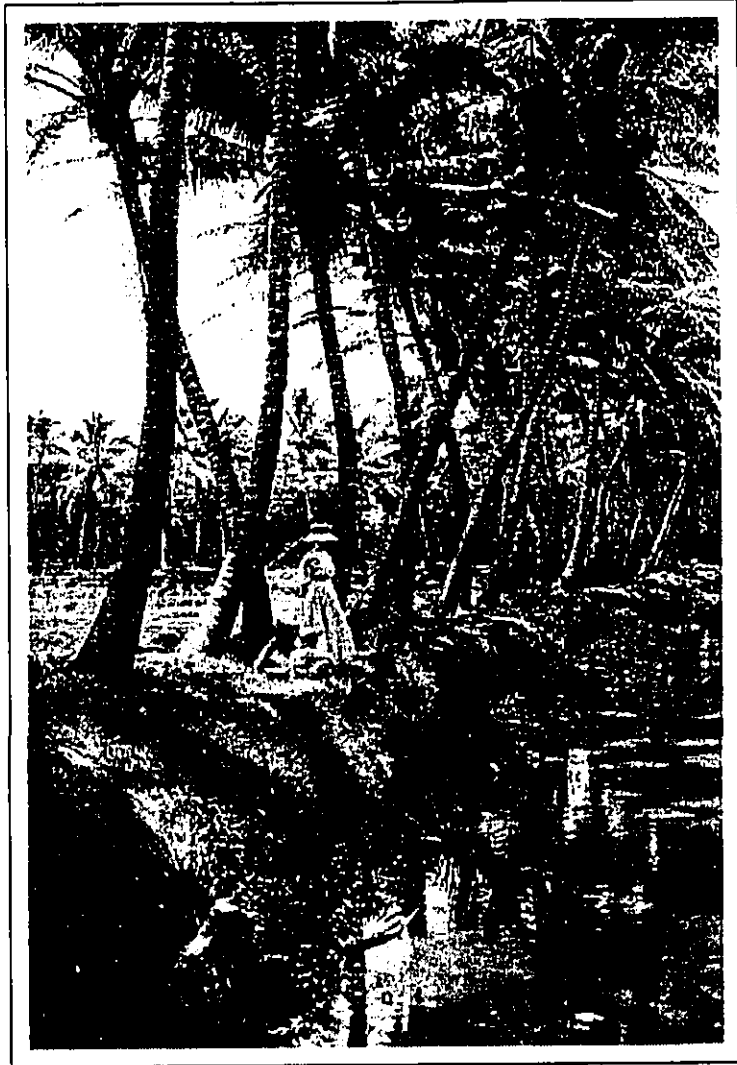
Mitigation

All construction vehicles must meet Title II, Administrative Rules of the Department of Health, Chapter 42, Vehicular Noise Control. All construction activities must meet the provisions of Title II, Administrative Rules of the Department of Health, Chapter 46, Community Noise Control.

4.14 Interrelationships and Cumulative Impact: Physical Environment

Potential impacts to the physical environment will be limited to the borders of the project site. Baseline data has been collected relative to the marine environment (both physical structure and water chemistry), indicating some input of fresh water to the nearshore environment. The collection of this data will allow future comparisons with regional data to determine any changes in nearshore marine water quality.

The infrastructure proposed for the resort will limit potential impacts to the marine environment. This is attributable to the construction of an on-site wastewater treatment plant. The overall physical appearance of the region (open space) will remain unchanged. There are no known projects in the near future that would impact the project area, or the region in its vicinity. Agricultural activities are continuing on land in the region. This includes the on-going sugar activities of Gay and Robinson, Inc., and other agricultural activities on land owned by Gay and Robinson, Inc. The open character of the project will complement the region, particularly since buildings on the project site will not be visible from Kaumualii Highway. cum.



5

ASSESSMENT OF EXISTING
CONDITIONS, PROBABLE
IMPACTS AND MITIGATION:
SOCIO-ECONOMIC
ENVIRONMENT

5.0 ASSESSMENT OF EXISTING CONDITIONS, PROBABLE IMPACTS AND MITIGATION: SOCIO-ECONOMIC ENVIRONMENT

An Economic and Fiscal Impact Assessment was prepared for the proposed project by the Mikiko Corporation. Following is a summary of their findings. Their full report is attached to the EIS as Appendix F.

5.1 Population Impacts

Development of Kapalawai could affect population in several ways: (1) it is expected to attract new travelers to the State, primarily staying on-site; (2) construction and operational employment opportunities would lead to new de facto population on-site; and (3) some of those taking advantage of the construction and operational employment generated by Kapalawai might move from other counties or states because of job opportunities, thus increasing the Kauai County and/or Hawaii State resident population levels. Other household members might also accompany in-migrating individuals.

On-site population. Based on 250 developed cottages, with an occupancy of 1.95 people per unit, and an overall occupancy rate of 75 percent for the resort after three years, Kapalawai could be expected to accommodate an average of about 365 visitors per day (by 2004). In addition, about 143 operational employees would be present on an average day². On average, Kapalawai could also have about 240 construction workers on-site on any given day during 2001. These figures represent the total number of persons anticipated to be on-site over a 24-hour period.

Off-site population: In-migration to the State of Hawaii. The Kapalawai Resort is not anticipated to lead to any significant migration from out-of-State, as discussed below. However, to the extent that persons do move to the State because of its development, such in-migrants can be expected to reside in housing or transient accommodations located off-site.

Construction period. Hawaii's labor market is considered to have sufficient supply and the required skills to satisfy virtually all of Kapalawai's construction labor needs. However, a nominal number (2), or 1 percent of full time equivalent

² This number represents total employees present on the property over the course of multiple shifts.

(FTE)³ staffing needs are assumed to come from the U.S. mainland. These persons would be temporarily resident on Kauai during the project's development.

Operational period. Recent hotel openings on Kauai have been directly associated with little, if any, in-migration of persons from out-of-State. Human resource managers at the 413-room Sheraton Kauai Resort and the 216-room Holiday Inn SunSpree, which opened in December 1997, and November 1998, respectively, were interviewed regarding the amount of in-migration associated with their properties. In both cases, no line employees were known to have moved from out-of-State due to employment opportunities on Kauai. Only two management personnel at the Sheraton may have moved due to Kauai employment opportunities. This represents from 0 percent to 0.6 percent of the total employees at each hotel. For purposes of this EIS, 1 percent of Resort employees (a total of 2 individuals) were assumed to move to Kauai from out-of-State due to employment opportunities at Kapalawai.

Dependents. In-migrant dependents are estimated at an average of 0.2 FTE in-migrant construction worker (since the position on which the "move" is based would be temporary), and 1.0 per FTE in-migrant operational employee. This would result in 2 additional individuals who would migrate from out-of-State.

Off-site population: In-migration to the County. Resort construction at Kapalawai is likely to be associated with a temporary movement of employees between islands (primarily Oahu and Kauai), but its operations are expected to be staffed predominantly by prior island residents, as discussed below.

Construction. The amount of off-island construction labor Kapalawai will attract would be dependent on such factors as: (1) how the project is bid; (2) the bonding capacity and other on-going activities of Kauai-based general contractors at the time of construction; (3) the general contractor's criteria for selecting subcontractors; and other factors beyond prediction. Discussions with Kauai construction industry professionals and the head of the Contractor's Association of Kauai indicate, however, that there are general contractors on Kauai with the capacity to bond a construction project of Kapalawai's size. It was estimated that ultimate staffing for the resort's construction could vary from about 60 percent to 75 percent Kauai residents, assuming the general contractor is

³ Full time equivalent is defined as 40 hours per week, or 2,080 hours per year.

from Kauai. Based on this input, projections assume that 30 percent (72) of construction workers employed on-site would be from off-island.

Operations. The openings of the Sheraton Kauai and the Holiday Inn SunSpree are estimated to have drawn about 7 or 8 employees each from other islands. This represents 2.5 percent of all employees at the Sheraton, and 6 percent of those at the Holiday Inn. For purposes of this EIS, 5 percent (10 individuals) were assumed to move to Kauai from other islands due to employment opportunities created at Kapalawai.

Dependents. Similar to estimates provided for the State of Hawaii, each in-migrating construction employee is anticipated to be accompanied by an average of 0.2 dependents. This results in 14 dependent in-migrants during the construction phase. On average, each in-migrant operations employee is assumed to be accompanied by 1.0 dependent, resulting in a total of 10 in-migrant dependents during the operational phase.

5.2 Economic Impacts

The Kapalawai Resort could be expected to impact the economies of the State and the County of Kauai by: (1) attracting visitors who would make new expenditures; (2) generating construction activity, which would support expenditures for goods and services; and, (3) creating and supporting jobs and business enterprises in its ongoing operations. The new jobs would in turn generate additional personal income in the County and throughout the State.

Construction Expenditures. The estimated construction budget for the Kapalawai Resort is approximately \$33 million. The budget includes:

- **Professional services** (architectural, engineering, landscape design, legal, and similar services)
- **Bungalow construction** (including materials and labor, but excluding the furnishings, fixtures and equipment associated with the cottages)
- **Support facilities construction** (support and "back of house" facilities, including walkways, landscaping, swimming pools, restaurants and snack bars, and renovation of the former Robinson family residence, but also excluding furniture, fixtures, and equipment that may be purchased for these facilities)
- **Infrastructure construction** (all costs related to infrastructural development, such as sewage, utility and cable lines, roads, parking facilities, etc.)

Development of the resort is estimated to require about 280 person-years of labor. While the majority of this work would occur on-site, some, such as the professional and administrative positions related to construction, are likely to be primarily located off-site, including elsewhere on Kauai, or on Oahu. Direct personal income associated with these Hawaii-based positions could total about \$15.7 million.

Indirect and induced positions could total about 430 person-years of labor, for a total, including direct positions, of 710 person-years of labor for construction at Kapalawai. The indirect and induced positions could be supported throughout the State, but many would be located on Kauai.

Including its direct, indirect, and induced impacts, the project's development could support some \$30.2 million in wages and salaries for Hawaii residents.

Operational Employment. In addition to development-related positions, the Kapalawai Resort will support many long-term permanent jobs in its operations. Direct operational jobs are projected to stabilize at about 200 FTE positions. These new employment opportunities will include a variety of types and levels of work, such as opportunities in management, sales and marketing, registration/reservations, human resources, food service, maintenance and engineering, housekeeping, grounds keeping, and activities. The majority of these jobs would be located on-site.

Based on economic multipliers derived from the State of Hawaii's Input-Output Study (DBED&T, 1998), the total employment impacts of Kapalawai, including its indirect and induced jobs, could represent about 320 FTE positions throughout the State.

Direct wages and salaries paid to those employed in the resort's operations are expected to reach about \$5.3 million. Including personal income associated with the indirect and induced positions, the project could generate nearly \$12.3 million per year in ongoing payroll within the State (not including potential profits of proprietors whose businesses could serve Kapalawai, nor do they include employee benefits).

Visitor Expenditures. The anticipated mix of types of visitors staying at Kapalawai is based on the findings of a market study prepared by Mikiko

Corporation (Mikiko Corporation, June 1999). This study assumes the following average mix of guests at Kapalawai:

Westbound visitors – 75%
Eastbound visitors – 5%
Hawaii residents – 20%

Hawaii residents are not expected to contribute significant new expenditures to the State since it is assumed their vacation budgets would have been spent elsewhere in the islands even if Kapalawai did not exist. To the extent local residents choose to stay within the State for their budgeted vacations because of Kapalawai, this assumption underestimates the project's positive economic impacts and is therefore considered conservative. However, Kapalawai's unique vacation opportunities may result in some Hawaii residents vacationing on Kauai rather than other islands of the State. Thus for the purposes of projecting County of Kauai impacts that stem from visitor population levels, 50 percent of the resort's Hawaii resident visitor mix is assumed to be persons who would not have otherwise stayed on Kauai.

Bungalow expenditures. Bungalow revenues are projected to represent about \$8.8 million in 2002, increasing to \$10.7 million by 2004 as operations stabilize. This is based on an estimated achieved rate of \$185 per room night in 2002. Thereafter, real dollar increases of 3 percent per year are assumed until stabilization in 2004.

Other expenditures. Other expenditures from the anticipated out-of-state visitor markets are based on 1997 average daily expenditures of westbound and eastbound travelers to Hawaii (adjusted to 1998 dollars and considering exchange rate changes). Based on this analysis, eastbound visitors are projected to spend about \$186.00 per person per day⁴. Likewise, westbound visitors to Kapalawai could spend about \$91.50 per day per person on non-lodging items and services.

On average then, the typical out-of-State Kapalawai visitor is projected to contribute \$98.00 per day in non-lodging expenditures to the State's economy⁵. These expenditures would total about \$9.1 million in new visitor spending by 2002, and \$10.5 million per year upon stabilization of operations.

⁴ Expenditures would be for items such as food and beverages, retail, entertainment, activities, and inter-island travel.

⁵ This figure excludes any expenditures by Hawaii residents.

Total direct expenditures. In total, direct visitor expenditures are estimated to represent \$17.8 million in 2002, increasing to about \$21.2 million by 2004. Including the indirect and induced multiplier effects within the State, visitors attracted by Kapalawai could account for over \$36 million in new annual visitor expenditures by the time of project stabilization.

5.3 Fiscal Impacts

The Mikiko Corporation has estimated the fiscal impacts of the proposed resort by comparing the project's anticipated contributions to State and County revenues to government service costs associated with the additional population that may be attracted to the State and County due to the project's construction and operation. The Mikiko Corporation's findings are summarized below, and their complete report is attached as Appendix F.

County Real Property Tax Revenues. The most significant fiscal impact of the proposed resort for the County of Kauai is likely to derive from the higher real property taxes generated compared to those paid under its current land use designations and level of development. Total real property taxes for the project site payable in Fiscal Year 1999 are \$2,041. Net new real property taxes at the site are based on the County of Kauai's Fiscal Year 1999/2000 rates, as adopted by the Kauai County Council in May 1999. The Resort/Hotel and Commercial tax rates are the same, both representing \$8.40 per thousand dollars of assessed value of improvements and \$8.80 per thousand dollars assessed value of land.

The projected assessed value of the project site (after assumed entitlements in January 2001) are based on comparison to assessed values at other projects on Kauai, and recent property transactions. Assuming entitlements are received in 2001, the properties would be reassessed under new land use designations as of January 2002. Therefore, the new real property tax classifications would be applied in the next fiscal year, which would begin July 1, 2002.

After adjustments for the property taxes now paid for the project site, Kapalawai is anticipated to generate approximately \$420,000 annually in net new property tax revenues by 2003.

Other County Revenues. In addition to real property taxes, the County of Kauai is allocated a share of the transient accommodations taxes (TAT) collected by the State (6.5 percent of State TAT collections), and it obtains liquid fuel, utility

franchise, motor vehicle weight, and other licenses and permit fees from residents and businesses.

Given the expenditures for bungalow revenues projected to be generated by out-of-State visitors to Kapalawai⁶, the State's 7.25 percent TAT, and Kauai County's 6.5 percent share of State TAT collections, this could represent about \$50,000 in annual TAT revenues for the County by 2003.

Persons who move to Kauai for job opportunities offered by the project would also pay additional liquid fuel, utility franchise, motor vehicle and other minor County taxes. These miscellaneous tax sources could represent a nominal further increase in County taxes attributable to Kapalawai.

In summary, net new taxes earned by the County as result of the development of Kapalawai Resort and its future operation could represent about \$470,000 per year, on an on-going basis by 2004.

Additional State Government Operating Revenues. Additional operating revenues accruing to the State government are expected to derive principally from the general excise tax (GET) accruing from out-of-State visitors' expenditures in Hawaii. Other sources of new State revenues attributable to the Kapalawai Resort include its share of TAT⁷, as well as GET, income and other taxes paid by those who move to the State because of the project, and GET on the project's development costs.

Taxes paid by households that move to the state were adjusted downward from their historical levels to reflect the income tax rate reductions implemented by the State Legislature in 1998. These projected individual income taxes and other revenue sources from in-migrants are considered conservative because the overall figure was adjusted downward based on changes in State income tax levels, whereas the total figure includes specific excise and other taxes as well.

In total, new operating revenues for the State are estimated to amount to some \$1.3 million annually by project stabilization in 2004. The projected State tax revenues may be conservative because they do not include:

⁶ TAT paid by Hawaii residents staying at the Kapalawai Resort are not considered additional impact, since Hawaii residents are assumed to vacation elsewhere in the State.

⁷ The County of Kauai receives 6.5% of all TAT revenues collected in Hawaii.

- Potential income taxes from proprietary operating income, including those that may be paid by the operating entity for the resort;
- GET or possible income taxes on ground lease rents earned by the landowner; or
- The State surcharge on motor and tour vehicles that would be rented by Kapalawai visitors.

Per Capita Government Operating Expenditures. Both State and County governments can be expected to incur additional operating expenses in supporting the in-migrants that are attracted by the development of the Kapalawai Resort. An analysis of the County of Kauai's 1995/1996 fiscal year expenditures suggests that the County spends about \$1,900 per resident per year, and about \$1,170 per full-time equivalent visitor-year. These expenditures support services ranging from public safety and highways to recreation and cash capital improvements.

A similar analysis of State government operating expenditures per capital suggest that the State spends about \$4,970 per year to support governmental operations on behalf of each resident, and \$1,840 per full-time equivalent visitor year.

Additional County and State Government Operating Expenditures. Applying the per capita budgets discussed above to the numbers of visitors and anticipated in-migrants to the County because of employment opportunities at Kapalawai, it is estimated that about \$420,000 per year in additional County government expenditures will be required as a result of the development and operation of the Kapalawai Resort, by the time of project stabilization in 2004⁸.

Net Fiscal Benefits. County government operating revenues from the proposed Kapalawai Resort are anticipated to exceed additional operating expenses by \$60,000 per year, as the project approaches stabilized operations (about 2004). The revenue/expenditure ratio for this relationship is projected to be 1:1.

On the other hand, with its far greater taxing powers and more varied sources of income, the State government's operating revenues are to anticipated to substantially exceed the additional operating expenses (\$760,000) associated

⁸ 50 percent of Hawaii-resident visitors to Kapalawai are considered "new population" for Kauai, meaning that the other 50% are assumed to be Hawaii residents who would have been likely to visit Kauai even without development of the project.

with the project throughout its development and operating periods. The revenue/expenditure ratio for this relationship is projected to be 2:4.

5.4 Traditional Customs and Practices

A native Hawaiian traditional customs and practices impact assessment for the proposed project was prepared by Cultural Surveys Hawaii, and has been reviewed ~~submitted to~~ by the Department of Land and Natural Resources, Historic Preservation Division. Following is a summary of Cultural Survey Hawaii's ~~their~~ findings. ~~Their~~ The full report is attached to the ~~DEIS~~ FEIS as Appendix G.

The purpose of the impact assessment was to consider the effects the proposed development may have on native Hawaiians as it pertains to their traditions and customs which are protected by law under the Hawaii State Constitution, Article XII, Section 7. Historical documents and maps were researched at the Hawaii state Archives, the Bernice Pauahi Bishop Museum Archives, the Kauai Historical Society, and the Kauai Museum. In addition, seven in-depth interviews were conducted with a total of nine people. Due to the exclusive use of the property by the Robinson family and its employees for over one century, except for Warren Robinson and Bruce Robinson, the majority of the interviewees were past employees of the Robinson family and had either worked and/or lived at the project area of Kapalawai at some time during their employment.

Even though most of the informants were prior employees and had spent time at Kapalawai, most had very little knowledge of Hawaiian legends, names and cultural practices related to the project area. All interviewees did have a common tie; they had all known a particular native Hawaiian man named Kuwalo who had worked for the Robinsons. All said that Kuwalo lived to be 104 years old. Due to the age and memories of most of the informants, information they heard from Kuwalo was not retained.

The interviews were a valuable part of the assessment for providing useful information about people, land use, boundaries and place names, and also helped to explain the lack of cultural practices within the project area.

Existing Conditions

~~Investigations for the assessment study have failed to turn up evidence of traditional customs and practices in the 170-acre parcel known as Kapalawai.~~

The lack of such evidence reflects the geographic location of the parcel as well as the nature of the land tenure. The project area is located on the flat table lands of Makaweli near the coast. There is no abundant source of surface water other than the on-site fishpond that is fed by underground springs. Prior to the Robinson's the *ahupua'a* of Makaweli had always belonged to the *alii* and it is highly possible that this particular fishpond was reserved solely for their use. A document search did not disclose any *kuleana* (native tenant) claims within the project area. Oral interviews, which were a part of this assessment, did not indicate that there was a Hawaiian settlement of any kind within the project area. Archaeological evidence and research of Hawaiian trails within the *ahupua'a* support the settlement of larger inland population as opposed to a coastal one.

The Robinson family has owned the *ahupua'a* of Makaweli, which includes Kapalawai, since 1865. Because Kapalawai was utilized by the family as a residence, ranch, farm, and dairy, and because the family preferred complete privacy regarding all of their lands, it was not possible for outsiders to go onto the property unless they had been invited or had asked permission. Thus, if any traditional customs and practices had been carried out at Kapalawai prior to the family's arrival, these may not have been possible during the 134 years of the family's ownership. Anyone who might have been pursuing these customs and practices has long since passed away. During the oral history phase of this assessment, none of the interviewees could recall being told by their elders of any cultural practices in the project area.

Probable Impacts

Based on the past history, it is the conclusion of the assessment that the proposed development will have little or no impact on Hawaiian culture.

Native Hawaiians traditionally accessed the coastal areas for gathering and subsistence and for trade. Though there is no record of coastal trails and no LCA record of native tenant *kuleana* parcels within the proposed project area of Kapalawai, it is likely that native Hawaiians did practice traditional gathering and use rights in the project area and the off-shore waters prior to Eliza Sinclair's acquisition of the *ahupua'a* of Kapalawai. An 1857 lease between the guardians of Victoria Kamamalu and a group of 120 people from Makaweli and Waimea indicate that the *kapu* (protected/tabooed) items exempted from the lease were the orange trees at Waikea, the large trees of Maha'iha'i, the fort, the Po'alima taro fields, the small and large ponds in Kekupua, the *kapu* fish (*'o'opu*), and firewood—if it was for sale for personal and monetary gain. Thus, for example,

firewood for personal use could be gathered, along with any other traditional resource items not mentioned, such as *pili* grass for thatching, *hau* for cordage, plants for medicinal use, and marine resources in the off-shore waters. It is likely that any existing resources were utilized unless a specific *kapu* was placed on a particular item, as mentioned above. It is clear from the historic records that Kekupua Fishpond was reserved for the chiefs and, thus, the mullet would have been *kapu* to the native tenants. When Eliza Sinclair acquired Makaweli *ahupua`a*, she controlled the whole *ahupua`a* and its resources, which would have included the fishpond. It is evident that she continued the practice of reserving the mullet for personal use and keeping the pond resources *kapu* to the native tenants.

Research and oral interviews identified one historic property associated with a cultural tradition — the legend of a *mo`o* and a rock near the pond's edge where the *mo`o wahine* sits and can be seen. Very little is known about this particular *mo`o* who resides at Kekupua Pond. The pond is significant in that it houses the home and watery realm of the *mo`o*. Traditionally, *mo`o* were revered and worshiped and shrines on which to lay offerings were constructed. The presence of a *mo`o* in a pond contributes to the productivity of the pond, as well as, to the health and welfare of the people. Though the stone cannot be seen due to fallen debris, it is likely that the stone exists and is still there. It is recommended that prior to commencing restoration work on the pond, Hawila Kaleohano be contacted to identify the exact location of the stone. The recommendation is that the stone be preserved in place.

The issue of access to the shoreline is a non-issue as there are currently two public access routes adjacent to the east and west boundaries of the project area. The community is free to utilize these access routes and walk along the shoreline from Pakala all the way to the Waimea River. In addition to this, the present project plans include commitments to improve shoreline access by providing access routes from designated public parking areas from within the proposed development.

Investigations for the present assessment study have failed to turn up evidence of traditional customs and practices presently being exercised on the project site. This reflects the geographic location of the parcel, as well as the nature of the land tenure. The project area is located on the flat pasture lands of Makaweli near the coast. There is no abundant source of surface water other than the fishpond, which is fed by three underground springs. The *ahupua`a* of Makaweli had always belonged to the *ali`i* and it is likely that this particular fishpond was

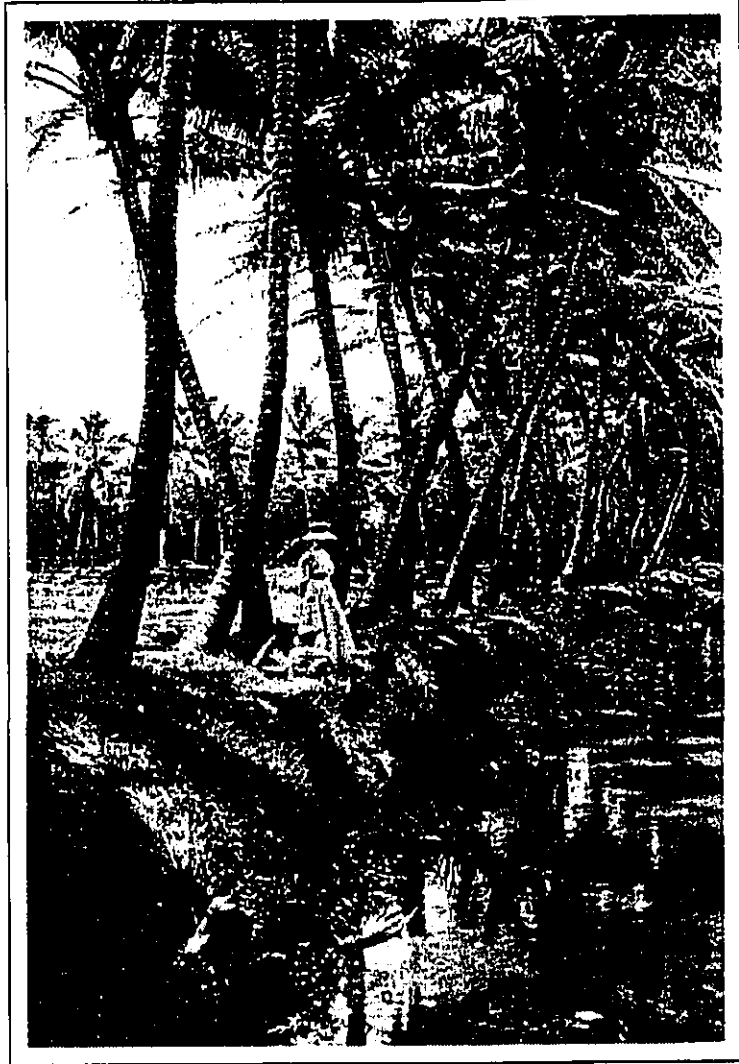
reserved solely for their use and it would not have been accessible to the common people of the area. A document search did not disclose any kuleana (native tenant) claims within the project area, though this does not mean that native Hawaiians were not living in this area. The oral interviews which were a component of the traditional customs and practices report, did not indicate there were any Hawaiian settlements within the project area. The general consensus among the informants interviewed was that known settlements tended to be closer to the Russian Fort and Waimea where there were more abundant sources of water and food. Archaeological evidence and research of Hawaiian trails within the ahupua`a support the settlement of a larger coastal and inland population concentrated near the seaward portion of the Waimea-Makaweli-Mokuone river valleys. The historic record reflects very little Hawaiian activity at Kapalawai, other than use of the fishpond.

The Sinclair-Robinson family has owned the ahupua`a of Makaweli, which includes Kapalawai, since 1865. Because Kapalawai was utilized by the family as a ranch, farm, and dairy, and because the Family preferred complete privacy regarding all of their lands, it was not possible for outsiders to go onto the property unless they had been invited or had received permission to do so. Thus, if any traditional customs and had been carried out at Kapalawai prior to the Family's arrival, these were most likely discontinued during the 135 years of the Family's ownership. Anyone who might have been pursuing these customs and practices have long since passed away. During the oral history phase of the traditional customs and practices report, none of the interviewees could recall being told by Kualo, or their elders, of any cultural practices in the project area. As a result, it is not likely that Hawaiian traditional customs and practices will be significantly affected by the proposed development.

5.5 Interrelationships and Cumulative Impact: Socio-Economic Environment

The proposed resort will positively contribute to the employment and fiscal and economic health of the region, the county, and the state. The number of businesses that will provide services to the resort is significant, creating additional employment opportunities. There have been other recent business additions to West Kauai. These include the high technology center and seed corn operation in Waimea. Collectively, these projects will beneficially impact the economy of West Kauai. These new ventures will not only provide additional jobs, but will diversify the economic base of West Kauai by providing employment in businesses not traditionally associated with West Kauai.

The defacto population of the area will increase modestly (about 365 people on an average day) related to the proposed project. Discussion of any other increases in defacto population for West Kauai are speculative at this point. Certainly, there has been a general trend toward additional visitors to Kauai that has followed the rise of the economy of Kauai, the increase in hotel occupancies and the return of some properties to visitor room inventories. All these developments will generally contribute to a better economic outlook for Kauai as a whole, including West Kauai. However, the average daily visitor census for Kauai has yet to reach that of pre-Hurricane Iniki. In 1991, the average daily visitor census was 19,020; in 1998 the average daily visitor census was 17,222, or 90 per cent of that prior to Iniki.



6

ASSESSMENT OF EXISTING
CONDITIONS, PROBABLE
IMPACTS AND MITIGATION:
PUBLIC FACILITIES

6.0 ASSESSMENT OF EXISTING CONDITIONS, PROBABLE IMPACTS AND MITIGATION: PUBLIC FACILITIES

6.1 Transportation

Traffic conditions in the region and the anticipated impacts associated with the resort were assessed by Wilbur Smith Associates. Their findings are summarized below and their complete report is attached as Appendix H.

Existing Conditions

EXISTING ROADWAY SYSTEM

Kaumualii Highway is the major roadway serving the areas in the vicinity of the project site. This roadway and the key cross streets in the area are discussed in the following paragraphs.

- **Kaumualii Highway** - This two-lane State highway is the major roadway providing access to the south and southwest areas of Kauai from Lihue westward to the Pacific Missile Range Facility at Barking Sands. This roadway passes through Waimea Town and most of the commercial uses have developed on the properties located adjacent to the roadway. The intersections with all cross streets in Waimea Town and other roadways in the vicinity of the Project site are controlled by STOP signs on the cross street approaches. The highway segment adjacent to the project site is rural in character with a posted speed limit of 50 mph in both directions. The posted speed limit in Waimea Town is 25 mph. Parallel parking is permitted along both sides of the roadway within Waimea Town. The section east of the site has a posted speed limit of 50 mph with speed reductions to 35 mph at the key intersections with the Pakala Village Road and the Kaumakani Mill Road.
- **Ala Wai Road, Waimea Town** - This two-lane street intersects Kaumualii Highway at the west end of the Waimea Stream bridge, and is the intersection closest to the Project site within Waimea Town. The roadway connects to Waimea Road, and provides access to the residential areas on either side of Kaumualii Highway, as well as the park area on the makai side. A single traffic lane is provided on each of the four approaches to the intersection.

- **Panako Road, Waimea Town** - This two-lane street extends one block mauka of Kaumualii Highway to provide access to Waimea Road and the commercial uses and parking areas along Waimea Road. The street extends several blocks makai to provide access to the Ishihara Market and the adjacent residential areas. On the mauka side, the approach to Kaumualii Highway is wide enough to permit vehicles turning right to pass by vehicles waiting to turn left or continue straight across the intersection. Only a single lane is provided for the makai-side approach. No turn lanes are provided on Kaumualii Highway although the curb parking is restricted near the intersection, thus allowing use by vehicles turning right or by through vehicles passing by vehicles waiting to turn left.
- **Menehune Road/Hapule Road, Waimea Town** - Menehune Road connects to the west end of Waimea Road commercial area as well as provides access to residential areas mauka of Waimea Road. The intersection with Waimea Road is located only about two car lengths from Kaumualii Highway. The Menehune Road approach to Kaumualii Highway has sufficient width to allow right-turn vehicles to pass by vehicles waiting to turn left. Hapule Road provides access to the commercial uses and residential area makai of Kaumualii Highway.
- **Pakala Village Road** - This gravel roadway provides access to the Pakala Village and Makaweli Post Office on the makai side of Kaumualii Highway and to the Kaawanui Village on the mauka side. Both approaches of this gravel roadway provide sufficient width to allow right-turn vehicles to pass by vehicles waiting to turn left.
- **Kaumakani Mill Road** - This paved two-lane street provides access to the Mill and village on the makai side of Kaumualii Highway. A short right-turn lane has been constructed on the eastbound approach of Kaumualii Highway.
- **Kaumakani Village Road** - This gravel roadway provides access to the Thrifty Mart and adjacent village area. The gravel roadway provides sufficient width to allow right-turn vehicles to pass by vehicles waiting to turn left. The Thrifty Mart has a direct exit driveway connection to Kaumualii Highway located east of the gravel roadway.

EXISTING TRAFFIC VOLUMES

Near the project site, the State of Hawaii Department of Transportation (DOT) periodically makes 24-hour machine counts of traffic along Kaunualii Highway at the intersection with Menehune Road/Hapule Road (Count Station #17-A), and east of Pakala Village Road at the Mahinauli Stream Bridge (Count Station #15-D). The most recent weekday count at Menehune Road was made June 17, 1997, and the most recent weekday count at the Mahinauli Stream station was made June 24, 1997. Based on these counts, the daily volumes of vehicles on area roadways are as follows:

Table 2
Daily Volume Vehicle Counts

Location	Weekday Volumes
Kaunualii Highway	
East of Pakala Village Road	10,200
East of Menehune Road	11,300
Menehune Road	2,300
Hapule Road	720

Source: Wilbur Smith Associates, 1999

The State DOT has not made any weekend traffic counts along Kaunualii Highway in recent years. Saturday and Sunday traffic counts are available for Kuhio Highway at the Count Station #CC-2 near Kilauea on the north side of Kauai. Daily traffic counts were obtained from that location for the month of January 1998. The counts indicated that traffic volumes along Kuhio Highway were higher on Saturdays than for Sundays, with the highest hourly volumes on either day occurring during the midday and early afternoon. For the weekdays, Fridays had the highest volumes, with the afternoon peak hour volumes slightly above those for Saturday.

Wilbur Smith Associates (WSA) conducted special traffic turning movement counts during Friday January 15, 1999 to represent traffic on a weekday afternoon and on January 16, 1999 to represent traffic on a Saturday afternoon. The counts were recorded for each 15-minute period between 6:00 and 8:30 AM and 3:00 and 6:30 PM on Friday, and from 11:00 AM to 4:00 PM on Saturday. The highest one-hour counts in the each of the three periods are used to

represent peak traffic volumes during the two weekday peak hours and for the Saturday peak hour.

Weekday Peak Hour Volumes

The highest weekday morning traffic on Kaumualii Highway near the project site occurred between 6:30 and 7:30 AM, with a total of 724 vehicles in both directions. Traffic volumes along Kaumualii Highway were higher to the east and west of the Project site, with peak hour volumes on those sections approaching 800 vehicles. Traffic volumes were higher in the westbound travel direction, most likely due to workers commuting to Pacific Missile Range Facility at Barking Sands. Within Waimea Town, the traffic on the mauka leg of each intersection was much higher than the volume on the makai side of Kaumualii Highway, with Menehune Road having higher volumes than Panako and Ala Wai Roads.

The highest traffic volumes on Kaumualii Highway during the Friday afternoon generally occurred between 3:45 and 4:45 PM when a total of 964 vehicles were counted near the project site, or about 26% higher than the morning peak hour. As in the morning, the traffic volumes along Kaumualii Highway increased eastward and westward from the project site. Traffic volumes were higher in the eastbound direction in the afternoon.

Within Waimea Town, the traffic volumes on the cross streets were generally two to three times higher than the volumes during the morning peak hour. The highest volumes occurred on the mauka legs of Panako Road and Menehune Road, with totals of almost 300 vehicles on each. These volumes reflect concentration of businesses and parking in the area adjacent to these streets.

Saturday Peak Hour Volumes

The highest volume of traffic on Saturday was recorded between 1:45 and 2:45 PM. The Saturday traffic volumes along Kaumualii Highway were similar to those in the weekday morning peak hour, with 719 vehicles near the Project site. For the cross streets, the Saturday traffic volumes were higher at most locations and for most movements than those recorded during the weekday morning peak hour, but less than those recorded during the Friday afternoon peak hour.

EXISTING TRAFFIC CONDITIONS AT KEY INTERSECTIONS

Traffic conditions were analyzed for the Friday morning and afternoon one-hour periods that have the highest volumes of traffic and for the Saturday afternoon peak hour.

Methodology for Analyzing Levels of Service

The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for use in evaluating the effectiveness and quality of service for roadways and streets. Different methodologies are available for analyzing traffic signal-controlled intersections and other types of roadways.

The TRB evaluation methods use a concept known as level-of-service (LOS). This concept describes facility operations on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively. The methods generally compare traffic volumes on a facility to the facility's theoretical capacity. Capacity is estimated based on the facility's physical characteristics (e.g. number and widths of lanes), traffic characteristics (e.g. types of vehicles), and type of traffic controls. The comparisons are frequently referred to as the volume-to-capacity ratio (V/C). The methodologies are described in the *1994 Highway Capacity Manual* (1994 HCM).

Signal-Controlled Intersections - Traffic conditions at traffic signal-controlled intersections were evaluated using the Operations Analysis methodology described in the 1994 HCM. Using this method, the level-of-service is based on the average delay time per vehicle passing through the intersection. The delay time, calculated in seconds, is the result of the phasing and timing of the traffic signal as well as the intersection's physical layout and the composition of the traffic. Average delay time and level-of-service are estimated for the entire intersection, for each roadway approach, and for each traffic movement or lane group.

The methodology also calculates a ratio of actual or estimated peak hour traffic volumes to the theoretical capacity of the intersection. This ratio indicates the proportion of available capacity being used by traffic volumes and where there is unused capacity available for future traffic increases. This volume-to-capacity ratio (V/C) reflects the physical characteristics of the intersection and the traffic

characteristics, and is somewhat independent of the efficiency of the traffic signal phasing/timing.

Unsignalized Intersections - At intersections with STOP sign controls, the level of service was calculated using the 1994 HCM procedures for intersections with STOP or YIELD signs. In this methodology, the six levels of service, A through F, are used to describe traffic conditions for those movements that must yield to other movements:

- Left-turn out of the side street or driveway;
- Through movement from the side street,
- Right-turn out of the side street or driveway; and
- Left-turn into the side street.

Through vehicles on the major streets are not required to yield to other movements at two-way STOP controlled intersections.

The general indicator of intersection delay is determined by calculating the one-hour capacity for each key movement, based on the conflicting traffic volumes, and then comparing the number of vehicles making that maneuver to the calculated capacity. The unused or "reserve" capacity for the movement is then used to identify a delay time and a level-of-service for that movement. Unlike analysis at signalized intersections, an overall intersection level-of-service is not calculated, but a level-of-service is calculated for each lane group subject to the STOP or YIELD condition.

The level-of-service criteria for unsignalized intersections with STOP or YIELD controls is shown in Table 3.

**Table 3
LEVEL-OF-SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS**

LOS	Average Stopped Delay (seconds/vehicle)
A	<5.0
B	5.1 - 10.0
C	10.1 - 20.0
D	20.1 - 30.0
E	30.1 - 45.0
F	>45

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Chapter 10, 1994.

Intersection Conditions

The traffic conditions at each of the key intersections are summarized in Table 4 for the weekday peak hours and the Saturday midday peak hour. The conditions indicated in the table are for the traffic movement at each intersection that experiences the longest wait time (delay) to travel through the intersection. For these STOP sign-controlled intersections, the longest delay usually occurs for the higher volume left-turn movement from the cross street, such as the left turn movement from Menehune Road at its intersection with Kaumualii Highway.

During the weekday morning peak hour, the left-turn movements at each of the six key intersections included in the study operated with short delays averaging between 9.5 and 11.2 seconds, equivalent to levels of service (LOS) B or C.

Average delays for the left-turn movements during the Friday afternoon peak traffic hour were higher at each of the intersections than the delays for the morning peak hour. This resulted from the higher volume of through traffic along Kaumualii Highway during the afternoon peak hour, which provides fewer gaps for vehicles to exit the side streets, combined with a higher volume of vehicles turning left at several of the cross streets.

The longest Friday afternoon peak hour delays were calculated for the vehicles turning left from makai-bound Menehune and Panako Roads in Waimea Town. The delays for these left-turn movements averaged approximately 22 to 23

seconds, equivalent to LOS D. Field observations indicated that delays by left-turn vehicles on Menehune Road did occasionally interfere with vehicles exiting Waimea Road to turn right onto Kaunualii Highway. The left turn traffic at the other study intersections operated at LOS C conditions.

For the Saturday midday peak hour, the delay for most of the left-turn movements were similar to those for the weekday morning peak hour. The exception was the turns from the Kaumakani Village Road, where the average delay (17.5 seconds, LOS C) was the same as for the Friday afternoon peak hour.

**Table 4
EXISTING CONDITIONS AT KEY INTERSECTIONS**

Kaunualii Hwy. Intersection and Traffic Movement	Friday Morning Peak Hour		Friday Afternoon Peak Hour		Saturday Midday Peak Hour	
	ADPV	LOS	ADPV	LOS	ADPV	LOS
Menehune Road Makai-bound Left Turn	11.2	C	23.0	D	11.9	C
Panako Road Makai-bound Left Turn	9.5	B	21.9	D	10.4	C
Ala Wai Road Makai-bound Left Turn	10.3	C	15.9	C	9.6	B
Pakala Village Road Mauka-bound Left Turn	9.8	B	15.4	C	9.9	B
Kaumakani Mill Road Mauka-bound Left Turn	10.3	C	14.0	C	9.3	B
Kaumakani Village Road Mauka-bound Left Turn	10.5	C	17.5	C	10.2	C

ADPV = Average delay per vehicle, in seconds.
LOS = Level of service for the traffic movement.

Source: Wilbur Smith Associates; 1999.

Probable Impacts

2002 CONDITIONS WITHOUT THE PROJECT

The Kapalawai Resort is planned for completion and full operation by early year 2002. Forecast traffic volumes and conditions are presented for early in year

2002 without the Kapalawai Resort Project as a base from which to identify the incremental effects of the Project.

ROADWAY IMPROVEMENTS

No major modifications are expected for the roadways near the Project site by year 2002. The State DOT plans to construct left-turn lanes on Kaumualii Highway at several intersections that have higher volumes of vehicles turning left from Kaumualii Highway. Left-turn lanes are planned for Kaumualii Highway at the intersection with the Pakala Village/Post Office Road, ~~and with the~~ Kaumakani Mill Road, and with the Kaumakani Village Road. The left-turn lanes should improve traffic safety at these intersections and reduce delays to through traffic caused by vehicles waiting to turn left. The additional lanes should not have a significant effect on the delays to traffic entering Kaumualii Highway from the cross streets at these locations.

TRAFFIC GROWTH WITHOUT THE PROJECT

No major new development projects are anticipated for the areas near the Project site by early 2002. Traffic increases over the next three years are expected to primarily result from increases in activity levels for the existing commercial and recreational uses in the southwest Kauai area, and small infill development or small increments of new developments in the area. An annual area growth factor was used to estimate the traffic increases from these sources. In addition, the Pioneer Hi-Bred facility being constructed near the Project site will add traffic along the adjacent section of Kaumualii Highway.

Area Traffic Growth Factor

The traffic growth factor for the roadways near the Project site was based on the traffic counts for the nearest count station along Kaumualii Highway for which historic count data was available. Traffic count data from State DOT count stations #15-D and #17-A, located along Kaumualii Highway in the study area, was available for the period between 1993 and 1997, which indicated average annual increases of 1.6 to 1.8% along Kaumualii Highway. Based on these counts, the average annual growth rate of 1.8% was used to represent traffic increases for the next three years, both for weekdays and weekends. This annual rate provides an increase of 5.5% over the three years.

Pioneer Hi-Bred Facility

The Pioneer Hi-Bred facility is expected to employ approximately 50 workers. This work force is estimated to generate approximately 23 and 22 peak vehicle

trips during the weekday morning and afternoon peak hours, respectively. The routing for these trips was based on local traffic patterns. No vehicle trips were added to the Saturday midday peak hour.

Weekday and Sunday Peak Hour Volumes

The growth factor was applied to all traffic movements at the key intersections near the Project site, and the Pioneer Hi-Bred trips were added to the weekday traffic volumes.

TRAFFIC CONDITIONS AT KEY INTERSECTIONS

The traffic conditions for the left-turn movements from the cross streets at the key Kaumualii Highway intersections are summarized in Table 5.

**Table 5
2002 CONDITIONS AT KEY INTERSECTIONS WITHOUT PROJECT**

Kaumualii Hwy. Intersection and Traffic Movement	Friday Morning Peak Hour		Friday Afternoon Peak Hour		Saturday Midday Peak Hour	
	ADPV	LOS	ADPV	LOS	ADPV	LOS
Menehune Road Makai-bound Left Turn	12.4	C	27.6	D	13.0	C
Panako Road Makai-bound Left Turn	10.3	C	26.5	D	11.2	C
Ala Wai Road Makai-bound Left Turn	11.2	C	18.1	C	10.3	C
Pakala Village Road Mauka-bound Left Turn	10.8	C	18.0	C	10.6	C
Kaumakani Mill Road Mauka-bound Left Turn	11.4	C	15.6	C	9.8	B
Kaumakani Village Road Mauka-bound Left Turn	11.5	C	20.1	D	10.9	C

ADPV = Average delay per vehicle, in seconds.
LOS = Level of service for the traffic movement.

Source: Wilbur Smith Associates, 1999.

In the weekday morning peak hour, the critical left-turn movement from each of the study intersections is forecast to operate at LOS C.

In the weekday afternoon peak hour, the critical left-turn movements at the Menehune and Panako Road intersections would remain at LOS D, although the delay times would be approaching the threshold for LOS E (30 seconds). The additional traffic at the Kaumakani Village Road intersection would worsen conditions to LOS D for the left-turn traffic at that intersection. The other left-turn movements would remain at LOS C.

The delays to left-turns at each of the intersections would increase by around one second or less for the Saturday midday peak hour. Left-turn traffic conditions would worsen to LOS C for the intersections with Ala Wai and Pakala Village Roads (from LOS B). The other intersections would remain at their existing LOS B or C conditions.

2002 CONDITIONS WITH THE PROJECT

Construction Period Impacts. During construction of the project, there will be an increase in the number of trucks and other construction vehicles, including employees, that will be entering and exiting the property. Construction employees will probably enter the property from the existing main driveway. Employees would exit the property either at ascend existing gate about 300 feet west of the Aakukui Stream Bridge, or from an existing driveway servicing the 8 plantation homes on the property. Heavy trucks would use the gate closest to the bridge.

Vehicles making left turns into the property from Kaumualii Highway could cause traffic to back up behind them. This potential impact should be minimized because direction of travel will be counter to peak directional flow, and the duration of disruption would be temporary, for the approximate one-year construction period.

Operational Period Impacts. The Kapalawai Resort is planned for completion and full operation by early-year 2002. The traffic assessment reflects a peak season level of use of the project for both a weekday and a Saturday.

Access to the Kapalawai Resort will be provided by two one-way driveway connections to Kaumualii Highway. The existing paved driveway to the Robinson family residence, located near the western (Waimea) boundary of the site, will serve as the entrance driveway. The exit driveway will intersect Kaumualii Highway at the location of the existing driveway to plantation homes, located about 480 feet east of the entrance driveway.

VEHICLE TRIP GENERATION

The number of vehicle trips to/from the Project was estimated using the average trip generation rates for a full-service resort hotel (land use category #330) as compiled in *Trip Generation* by the Institute of Transportation Engineers (ITE). The ITE trip rates for a resort hotel are generally higher than those for either Waikiki or Neighbor Island hotels. Therefore, the use of the ITE trip rates should provide a conservative (high) estimate of the number of trips generated by the Kapalawai Resort project.

The trip rate selected for weekdays was based on the number of occupied rooms, rather than other available rates based on total rooms or total number of employees. The rate based on occupied units is more reflective of peak season. The ITE Saturday rate for occupied units is about twice the weekday rate. This large differential was due to only one observation for Saturday for this rate basis, which may have included unique features that resulted in higher weekend use unrelated to the number of guest units. The ITE Saturday rate was used since it should fully reflect any weekend use of the Resort's dining and other facilities by local residents, as well as visitors to the museum. The estimated numbers of weekday and Saturday vehicle trips was based on an occupancy level of 90% of the units, which reflects a high usage day in the peak season.

In addition, public access would be permitted to the beach areas of the site. For forecast purposes, it was assumed that a peak of approximately 40 parking stalls would be used by residents using the beach areas. The trip rates per parking space are based on typical usage rates for these types of uses.

The Project is estimated to generate a total of about 1,880 vehicle trips on a weekday during the peak visitor season and about 3,180 vehicle trips on a Saturday. In the weekday morning peak hour, about 108 vehicle trips would be generated to or from the Project, including arriving and departing employees. Higher levels of guest activity in the afternoon peak hour would result in 143 vehicle trips to or from the site, with the trips almost evenly split between vehicles entering and exiting the Project. A total of 297 vehicle trips could be generated by peak use on a Saturday afternoon, which would reflect a special event at the site that attracts local residents and/or visitors from other resort areas.

PEAK HOUR TRAFFIC VOLUMES

The project vehicle trips were distributed and assigned to the adjacent roadway system based on the existing traffic patterns in the study area. Slightly more trips

were assigned to/from areas east (Lihue/Poipu side) of the Project than to the west (Waimea Town side).

The project is estimated to increase the peak hour volumes on Kaumualii Highway just to the east of the site by 8% during the weekday peak hours and by 20% on a Saturday with special events at the site. To the west, the project traffic would add an estimated 6% increase to the weekday peak hour volumes and 18% to the Saturday peak hour volumes on Kaumualii Highway near the site.

TRAFFIC CONDITIONS AT KEY INTERSECTIONS

Traffic conditions during the weekday and Saturday peak hours with the Project is summarized for each key intersection in Table 6.

Project Driveways

The left-turn movements into and out of the Project driveway connections to Kaumualii Highway are forecast to operate at very acceptable conditions for each of the peak hour periods. As listed in Table 6, the vehicles turning left from the mauka-bound exit driveway would operate at LOS C during each period. The left-turn movement from westbound Kaumualii Highway would operate at LOS A with the forecast volumes.

Based on the forecast peak hour volumes and traffic conditions, STOP sign controls would be appropriate for the exit driveway.

Nearby Key Intersections

In the weekday morning peak hour, the conditions for the critical left-turn movement from each of the study intersections is forecast to remain at LOS C. The Project would increase the average delay by about one second or less for the left-turn movement at each intersection.

**Table 6
2002 CONDITIONS AT KEY INTERSECTIONS WITH PROJECT**

Kaunualii Highway Intersections and Traffic Movement	Friday Morning Peak Hour		Friday Afternoon Peak Hour		Saturday Midday Peak Hour	
	ADPV	LOS	ADPV	LOS	ADPV	LOS
Menehune Road Makai-bound Left Turn	13.3	C	31.4	E	16.0	C
Panako Road Makai-bound Left Turn	11.0	C	31.2	E	14.2	C
Ala Wai Road Makai-bound Left Turn	12.1	C	20.3	D	12.8	C
Project Driveways Mauka-bound Left Turn	11.7	C	19.6	C	16.6	C
Westbound Left Turn	3.5	A	4.4	A	3.7	A
Pakala Village Road Mauka-bound Left Turn	11.8	C	20.7	D	13.6	C
Kaumakani Mill Road Mauka-bound Left Turn	12.5	C	17.6	C	12.2	C
Kaumakani Village Road Mauka-bound Left Turn	12.7	C	23.0	D	13.8	C

ADPV = Average delay per vehicle, in seconds.
LOS = Level of service for the traffic movement.

Source: Wilbur Smith Associates, 1999.

In the weekday afternoon peak hour, the project traffic would increase average delay for the critical left-turn movements at the Menehune and Panako Road intersections by about 4 to 5 seconds. This increase would worsen the conditions to LOS E, from LOS D. Given the forecast LOS E conditions, the afternoon conditions at these two intersections were checked against the warrants for installation of traffic signal controls (see "Mitigation").

For the weekday afternoon peak hour, the additional traffic at the Pakala Village Road intersection would increase average delay to LOS D for the left-turn traffic at that intersection. The left-turn movements at the other intersections would remain at LOS C.

The delays to left-turns at each of the intersections would increase by about 2 to 3 seconds for the Saturday midday peak hour. Left-turn traffic conditions would

worsen to LOS C for the intersection with the Kaumakani Mill Road (from LOS B). The other intersections would remain at the LOS C conditions forecast without the Project.

Mitigation

Construction Period. In an effort to minimize traffic disruptions during the morning and afternoon peak hours, the start and finish times for work crews should be timed to avoid these periods. Likewise, delivery of materials and heavy equipment should also avoid morning and afternoon peak hours.

It is recommended that the left-turn storage lane discussed below (to mitigate operational period traffic impacts) be constructed as soon after final permit approvals as is practicable. This action will also mitigate stacking of vehicles making left turns into the property during employee arrivals.

It is also recommended that personnel be stationed at the exit points to the property during periods of high volume of deliveries and arrival of heavy equipment to assist in the direction of traffic.

Operational Period. Mitigation actions were considered at the Kaumualii Highway intersections with the project driveways and with Panako and Menehune Roads.

Project Driveways

The analyses indicate that STOP sign control is appropriate for the exit driveway approach to Kaumualii Highway for the year 2002 peak hour conditions.

Left-turn storage lanes are typically considered for locations where 100 or more vehicles turn left in a one-hour period. Because of the high speeds along this section of Kaumualii Highway, it is recommended that a left-turn lane be provided for the vehicles waiting to turn left from westbound Kaumualii Highway into the project entrance driveway. This would reduce the potential for accidents as well as delays to through traffic. The length of the left-turn storage lane should be sufficient to accommodate at least 3 or 4 waiting vehicles, or a minimum of 100 feet in length.

Separate left- and right-turn lanes are recommended for the exit driveway at the intersection with Kaumualii Highway to minimize any delay to vehicles turning right from the driveway.

A right-turn deceleration lane is recommended on westbound Kaumualii Highway at the entrance driveway for the Project for safety purposes and to minimize delays to through traffic.

Panako and Menehune Roads

The analyses indicate that the increased volume of project and non-project traffic at these two intersections with Kaumualii Highway would result in increased delays by vehicles turning left from the cross streets. The traffic turning left from the makai-bound approach of each street is expected to experience delays equivalent to LOS E for the Friday afternoon peak traffic hour. The conditions for traffic turning left from the mauka-bound approaches are forecast as LOS D at Panako Road and LOS C for Hapule Road (opposite approach of Menehune Road).

Installation of a traffic signal at one or both of these intersections would be one method of facilitating this left-turn movement, given the delays in waiting for a gap in Kaumualii Highway traffic. The State DOT would have to approve any installation of a traffic signal along a State highway. Except for rare exceptions, the State DOT will not approve a traffic signal for a location unless it satisfies one or more "warrants" for installation of a traffic signal.

Highway officials have adopted a series of these "warrants" that govern consideration of a traffic signal at a location.⁹ If a location does not satisfy one or more of the warrants, a traffic signal is not appropriate; if it satisfies one or more warrants, a traffic signal *may be considered* as a potential action to improve operations or safety.

The forecast conditions at the two intersections with Kaumualii Highway were assessed relative to two of the warrants:

- **Warrant #10 Peak Hour Delay**

The initial criteria for this warrant is that the minor street approach must experience total delay of at least four vehicle hours for a

⁹ *Manual on Uniform Traffic Control Devices*, U. S. Department of Transportation, Federal Highway Administration, 1988.

single lane approach and five vehicle hours for a two-lane approach, during the peak one-hour period.

Neither of the intersections satisfy this requirement since the estimated total delay in the worst peak one hour (Friday afternoon peak hour) is 0.54 vehicle hours at the Panako intersection and 0.52 vehicle hours at the Menehune Road intersection, with these total delays substantially below the minimum requirement for either a single- or two lane approach.

- **Warrant #11 Peak Hour Volume**

For the number of lanes at this intersection and the Friday peak hour volumes along Kaumualii Highway, this warrant would require either:

1. A minimum of 75 vehicles exiting the higher volume approach of the cross street in the peak hour if that approach has only a single approach lane.
2. A minimum of 100 vehicles exiting the higher volume approach of the cross street in the peak hour if that approach has two approach lanes (separate left- and right-turn lanes).

The makai-bound approaches on both streets have a single wide lane that permits right-turn vehicles to pass by the waiting left-turn vehicles, thereby functioning as two approach lanes. The Panako Road approach has 75 peak hour vehicles, while the Menehune Road approach has 143 vehicles in the afternoon peak hour. However, the left-turn and through volumes, those with the long delays, amount to only 31 vehicles at Panako Road and 48 at Menehune Road.

The Panako Road intersection does not satisfy this warrant, while the Menehune Road intersection does meet the minimum volume warrant as a result of the very high volume of vehicles turning right from this approach.

The Menehune Road approach would pose a traffic operations problem with the installation of a traffic signal. The traffic signal would result in the queue of

waiting vehicles stacking beyond and blocking the left-turns from the Waimea Road approach to Menehune Road. The Panako Road intersection provides the better geometric layout for installation and operation of a traffic signal as a result of its slightly longer block length between Kaumualii Highway and Waimea Road.

Due to the marginal satisfaction of the minimum warrants and the potential queuing problems on the mauka side of the intersections, a traffic signal does not appear appropriate at the intersections for year 2002. If a traffic signal is installed in the future, the Panako Road intersection would likely provide the better location due to the longer block length. A signal at Panako Road would also benefit the Menehune Road traffic by providing gaps in the westbound traffic flow along Kaumualii Highway. If a signal were to be installed at Panako Road, the 2002 Friday peak hour volumes would approximate 54% of intersection capacity and would operate at LOS B.

The installation of STOP signs on all four approaches (four-way STOP control) would not be appropriate for either intersection due to the much higher volumes on Kaumualii Highway as compared to either of the cross streets.

6.2 Utilities

A civil engineering report was prepared for the EIS by Wagner Engineering Services and included a discussion of existing and future utility demands. Their complete report is attached as Appendix I.

Existing Conditions

Electric/Telephone/Cable. Electric, telephone and cable television service from Kauai Electric, GTE Hawaiian Tel, and Garden Isle Telecommunications, respectively, are readily available from overhead lines on Kaumualii Highway (Wagner Engineering Services, 1999).

Water. Water Service from the Kauai Department of Water (DOW) is not available for the project site. DOW's Waimea system ends at the Waimea River, 0.8 miles west of the Kapalawai. Even if water transmission lines were extended to Kapalawai, the DOW system does not have source capacity to serve Kapalawai. DOW's system serving the Hanapepe area ends four miles to the east of Kapalawai (Nance, 1999)

Probable Impacts

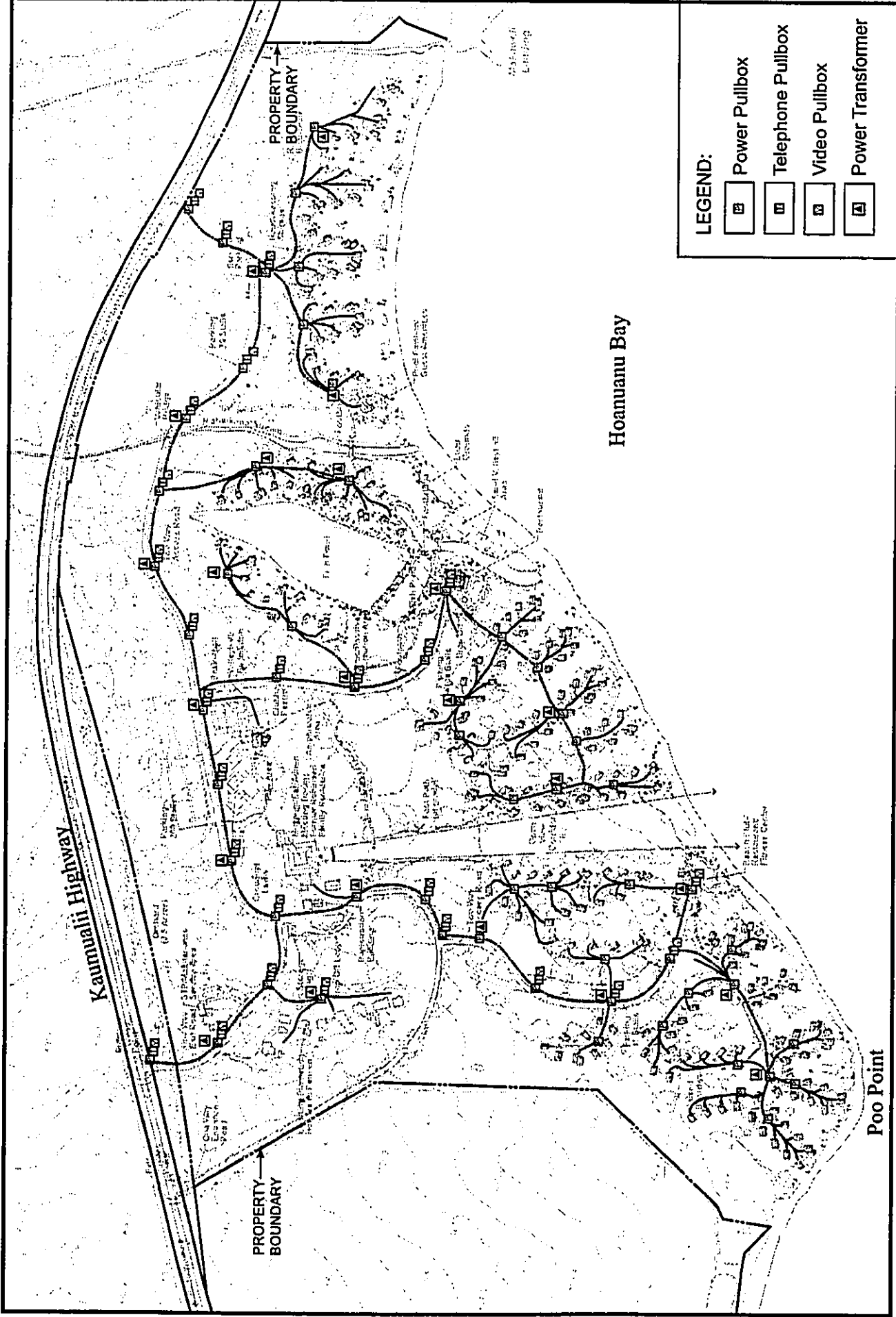
Electric/Telephone/Cable. Utility services will be brought underground from one or more of the several utility poles fronting the project site on Kaumualii Highway, and looped through the development to serve the various buildings within the project. High voltage primary electric service will be extended to several points within the property and transformed for service to all facilities. The individual cottages are to be serviced with power only and telephone and cable service will be extended to common areas such as the restaurants, tennis facilities, and the administrative facilities, and other guest services. A schematic drawing depicting the proposed underground service is shown on Figure 21.

Water. A dual, private, potable/irrigation water system is proposed for the Kapalawai Resort. Both systems will be privately developed and operated because service from the Kauai Department of Water (DOW) is not available in this area (Nance, 1999).

The choice to develop a dual (potable and irrigation) water system will take advantage of the supply potential of the spring-fed fishpond. Drawing water from this pond will augment its natural turnover rate, improving its water clarity while providing irrigation supply. It also allows elements of the potable system to be downsized accordingly (Nance, 1999).

Based on use rates in accord with DOW standards, it is estimated the year-round average potable water use to be approximately 0.12 million gallons per day (MGD). Peak seasonal use could be about 50 percent higher, or approximately 0.18 MGD (Table 7) (Nance, 1999).

In order to determine irrigation water needs year-round and peak season evapotranspiration data was collected from nearby Station 962.00. An additional 10 percent allowance for application inefficiencies was used. Based on these data, irrigation application rates in the summertime may be as high as 10,200 gallons per acre per day. Year-round irrigation use for the project is estimated to be 0.36 MGD. In the summer months, the rate could be as high as 0.66 MGD (Nance, 1999).



LEGEND:

	Power Pullbox
	Telephone Pullbox
	Video Pullbox
	Power Transformer

Proposed Underground Utility Service

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 21

Source: Wagner Engineering Services, 1999 Prepared by Helber Hastert & Fee, Planners

Table 7
Projected Potable Water Requirements of the Kapalawai Resort

Land Use	No.	Units	Use Rate (GDP/Unit)	Projected Water Use	
				Year-Round Avg. (MGD)	Peak Season (MGD)
Cottages	250	Each	350	0.0875	0.1312
Restaurants (2)	240	Seats	40	0.0096	0.0144
Fitness Center	2,000	Sq. Ft.	LS	0.0050	0.0075
Snack Bar	50	Seats	40	0.0020	0.0030
Tennis Clubhouse	2,000	Sq. Ft.	LS	0.0050	0.0075
Administration	11,132	Sq. Ft.	200/1000 sf	0.0022	0.0033
Registration Bldg.	NA	NA	LS	0.0010	0.0015
Car Storage	NA	NA	LS	0.0010	0.0015
STP/Maintenance	NA	NA	LS	0.0020	0.0030
Existing Plantation Homes	8	Ea	400	0.0032	0.0048
Total				0.1185	0.1777

Source: Nance, 1999

Figure 22 illustrates the main elements for the proposed potable and non-potable systems for Kapalawai.

6.3 Wastewater

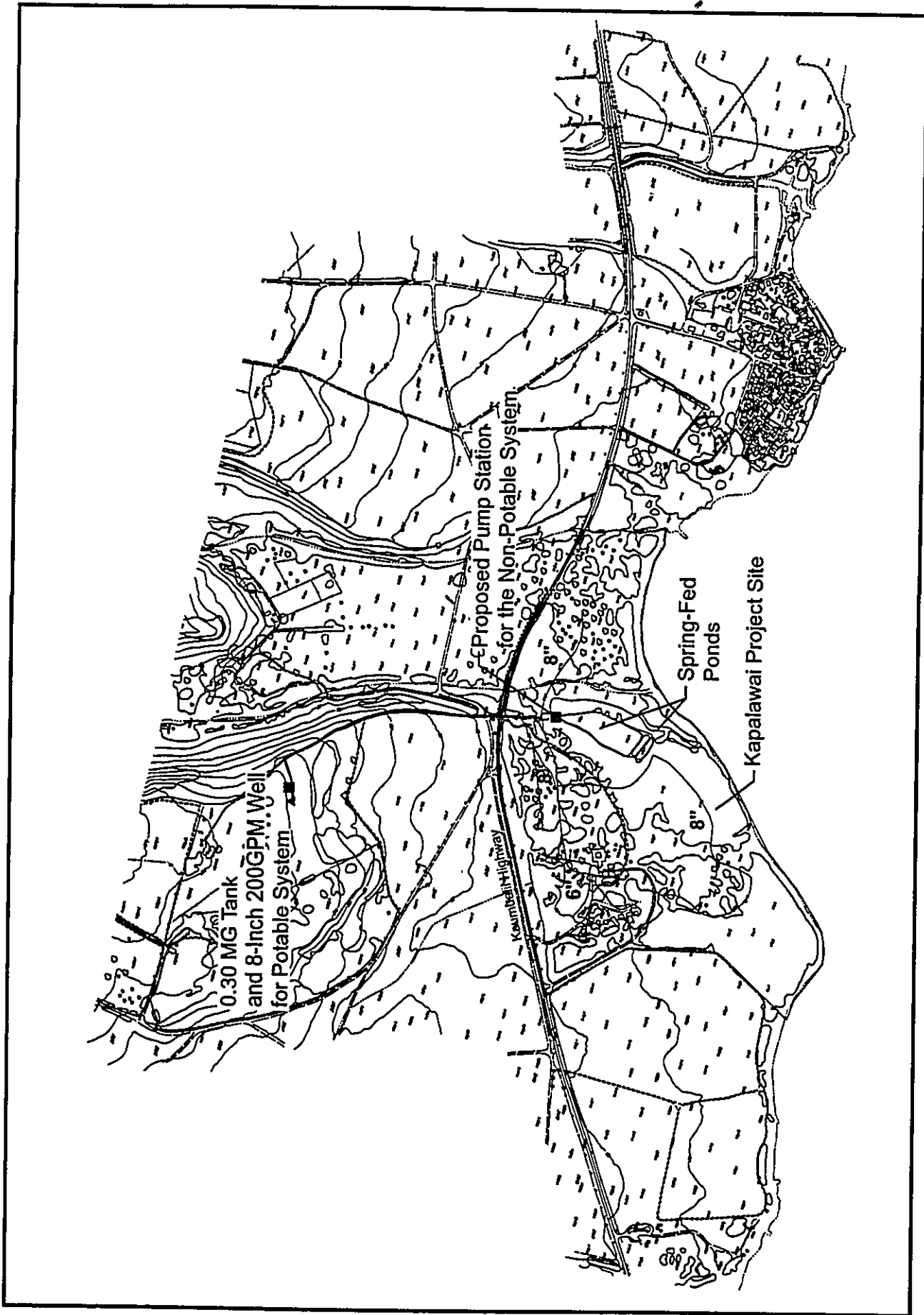
A civil engineering report was prepared for the EIS by Wagner Engineering Services and included a discussion of wastewater demands. Their complete report is attached as Appendix I.

Existing Conditions

The County of Kauai operates a wastewater treatment plant (WWTP) in Waimea, about one mile from the project site. The service area for this WWTP stops at the Waimea River, about 0.5 miles from the project site. The design flow for this facility is 0.3 million gallons per day (MGD). The WWTP is presently operating at capacity, and there are no plans to include the project site in its service area.

Probable Impacts

A private WWTP will be constructed on-site to handle all wastewater generated by the proposed resort. A description of the proposed system follows.



Proposed Water Systems

KAPALAWAI RESORT
Kapalawai, Kauai, Hawaii

Figure 22



Not to Scale
Prepared by Heiber Hastert & Fee, Planners

Source: Tom Nance Water Resources Engineering, 1999

6-22



Collection System. The proposed wastewater collection system includes the following elements:

- 14,600 linear feet of gravity sewer main;
- 15,500 feet of sewer laterals;
- 4,200 linear feet of force main;
- 44 sewer manholes,
- 4 sewage pumping stations, and
- 1 wastewater treatment plant.

Three of the pumping stations are located in the makai portion of the project site in order to receive flows from the cottages and other proposed facilities in that area. These pumping stations will lift wastewater to a main pumping station, which will lift and transmit wastewater to the WWTP. The proposed collection system is illustrated in Figure 23.

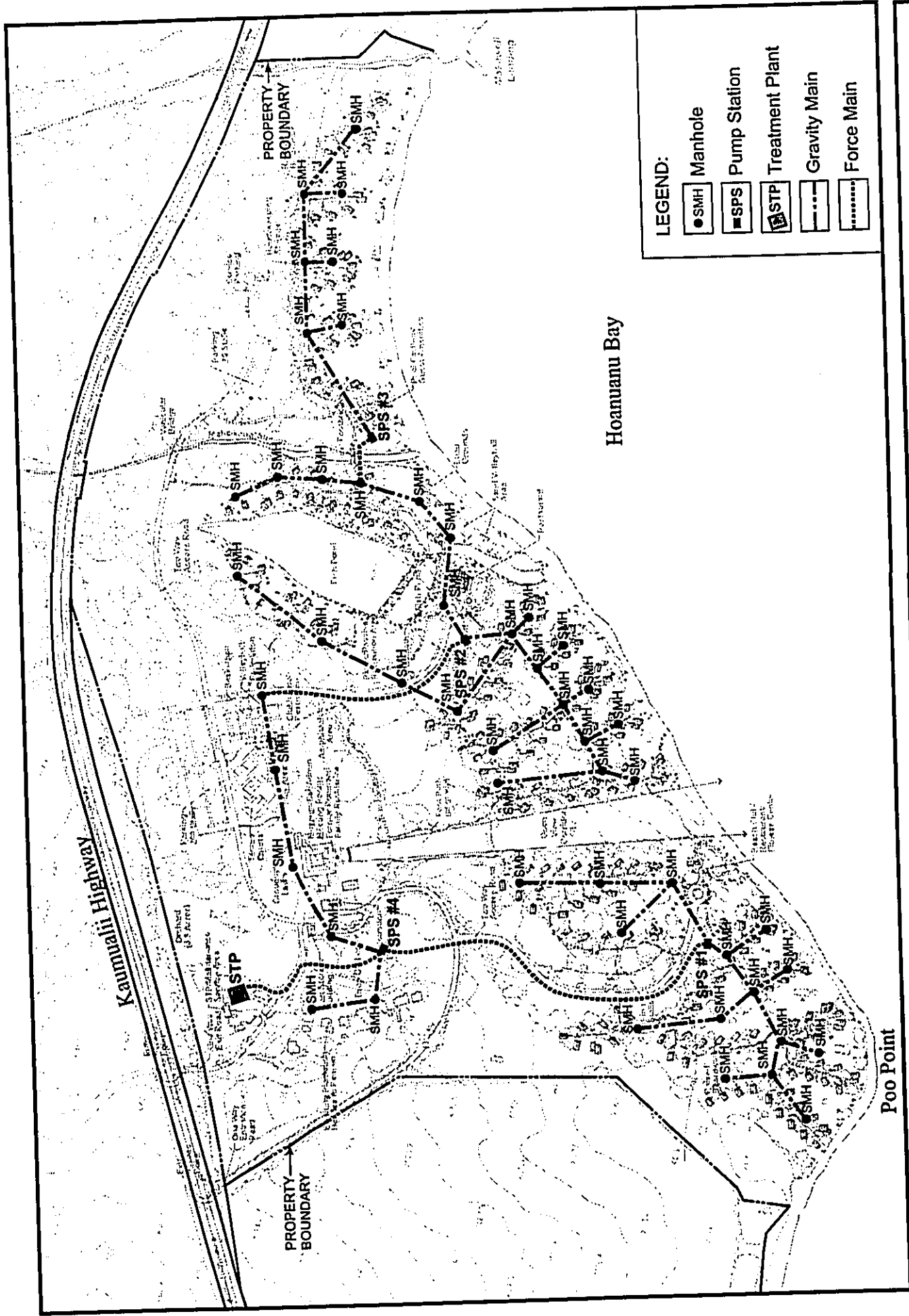
Proper design, operation, and maintenance of the pumping stations will assist in controlling odor problems. In order to prepare for the possibility of unforeseen odor problems, the stations will be designed to accommodate the addition of odor scrubbers, biofilters, or other appropriate odor-inhibiting appurtenances.

Wastewater Treatment Plant (WWTP). Wastewater flows can be estimated by considering return of potable water to the sewer system based upon certain return factors, as shown in Table 8.

**Table 8
Projected Wastewater Flows for the Kapalawai Resort**

Land Use	No.	Unit	Use rate (GPD/Unit)	Projected Water Use			Projected Wastewater Flow	
				Year Round Average (MGD)	Peak Season (MGD)	Return Factor	Year Round Avg. (MGD)	Peak Season (MGD)
Cottages	250	ea.	350	0.0875	0.1313	55%	0.0481	0.0722
Restaurants (2)	240	seats	40	0.0096	0.0144	65%	0.0062	0.0094
Fitness Center	2,000	sq. ft.	LS	0.0050	0.0075	65%	0.0033	0.0049
Snack Bar	50	seats	40	0.0020	0.0030	65%	0.0013	0.0020
Tennis Clubhouse	2,000	sq. ft.	LS	0.0050	0.0075	65%	0.0033	0.0049
Administration	11,132	sq. ft.	200 per 1,000 sq. ft.	0.0022	0.0033	65%	0.0014	0.0022
Registration Bldg.			LS	0.0010	0.0015	65%	0.0007	0.0010
Cart Storage			LS	0.0010	0.0015	65%	0.0007	0.0010
WWTP/Maintenance			LS	0.0020	0.0030	65%	0.0013	0.0020
Existing Plantation Homes	8	ea.	400	0.0032	0.0048	55%	0.0018	0.0026
			Totals	0.1185	0.1778		0.0680	0.1020

Source: Wagner Engineering Services, 1998



LEGEND:

●	SMH	Manhole
■	SPS	Pump Station
▣	STP	Treatment Plant
—		Gravity Main
---		Force Main

Figure 23

Proposed Wastewater System
KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii

Source: Wagner Engineering Services, 1999 Prepared by Heiber Hastert & Fee, Planners

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

Collection System. The proposed wastewater collection system includes the following elements:

- 14,600 linear feet of gravity sewer main;
- 15,500 feet of sewer laterals;
- 4,200 linear feet of force main;
- 44 sewer manholes,
- 4 sewage pumping stations, and
- 1 wastewater treatment plant.

Three of the pumping stations are located in the makai portion of the project site in order to receive flows from the cottages and other proposed facilities in that area. These pumping stations will lift wastewater to a main pumping station, which will lift and transmit wastewater to the WWTP. The proposed collection system is illustrated in Figure 23.

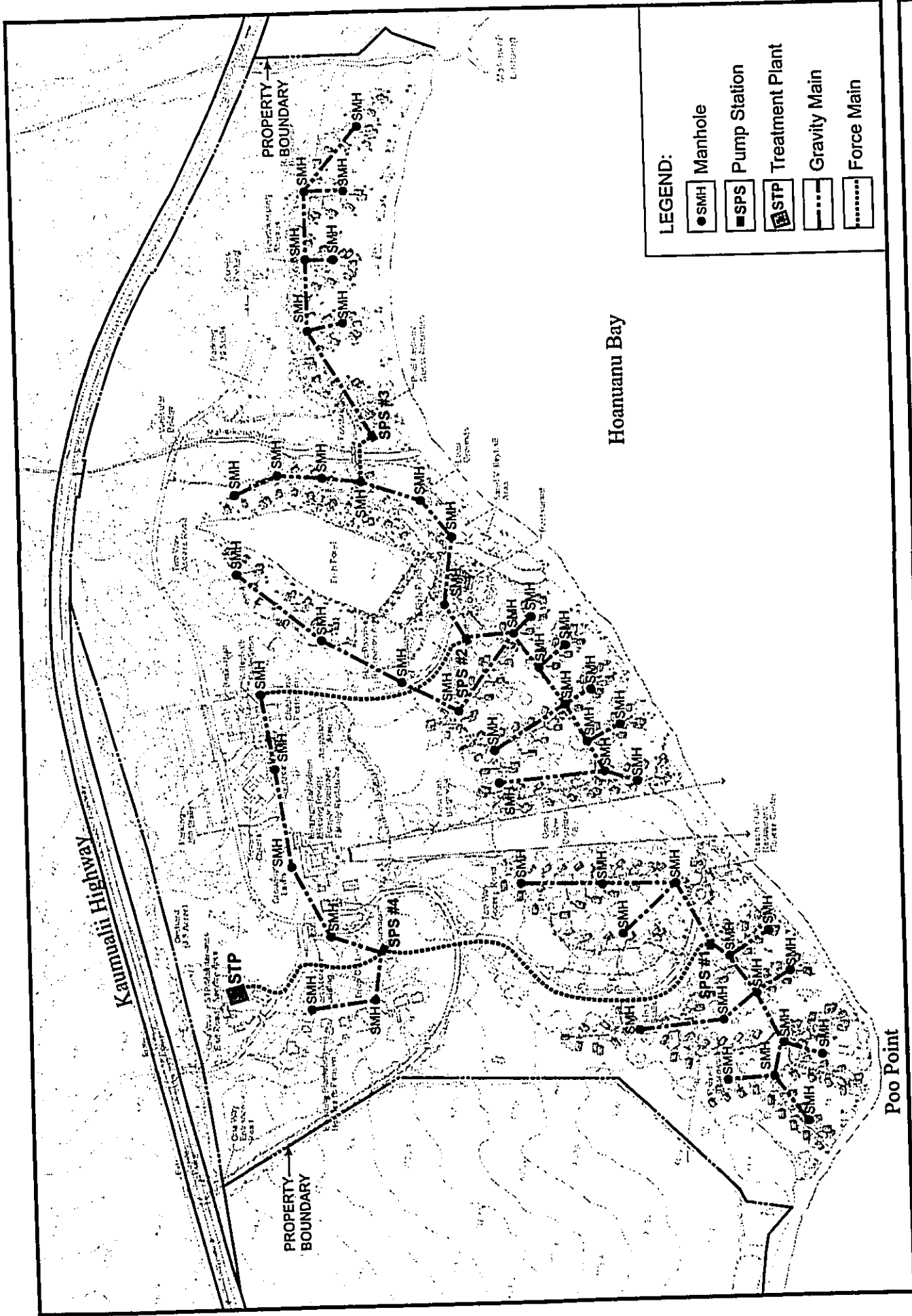
Proper design, operation, and maintenance of the pumping stations will assist in controlling odor problems. In order to prepare for the possibility of unforeseen odor problems, the stations will be designed to accommodate the addition of odor scrubbers, biofilters, or other appropriate odor-inhibiting appurtenances.

Wastewater Treatment Plant (WWTP). Wastewater flows can be estimated by considering return of potable water to the sewer system based upon certain return factors, as shown in Table 8.

**Table 8
Projected Wastewater Flows for the Kapalawai Resort**

Land Use	No.	Unit	Use rate (GPD/Unit)	Projected Water Use			Projected Wastewater Flow	
				Year Round Average (MGD)	Peak Season (MGD)	Return Factor	Year Round Avg. (MGD)	Peak Season (MGD)
Cottages	250	ea.	350	0.0875	0.1313	55%	0.0481	0.0722
Restaurants (2)	240	seats	40	0.0096	0.0144	65%	0.0062	0.0094
Fitness Center	2,000	sq. ft.	LS	0.0050	0.0075	65%	0.0033	0.0049
Snack Bar	50	seats	40	0.0020	0.0030	65%	0.0013	0.0020
Tennis Clubhouse	2,000	sq. ft.	LS	0.0050	0.0075	65%	0.0033	0.0049
Administration	11,132	sq. ft.	200 per 1,000 sq. ft.	0.0022	0.0033	65%	0.0014	0.0022
Registration Bldg			LS	0.0010	0.0015	65%	0.0007	0.0010
Cart Storage			LS	0.0010	0.0015	65%	0.0007	0.0010
WWTP/Maintenance			LS	0.0020	0.0030	65%	0.0013	0.0020
Existing Plantation Homes	8	ea.	400	0.0032	0.0048	55%	0.0018	0.0028
			Totals	0.1185	0.1778		0.0680	0.1020

Source: Wagner Engineering Services, 1999



LEGEND:

- SMH Manhole
- SPS Pump Station
- ▣ STP Treatment Plant
- - - Gravity Main
- Force Main

Proposed Wastewater System
KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii

Figure 23
 Source: Wagner Engineering Services, 1999 Prepared by Heiber Hasfert & Fee, Planners
 6-24

Any WWTP must also be capable of accommodating peak diurnal flows from the development. According to the County Kauai's Maximum Rate of Flow Chart, a peaking factor of 5.0 should be applied to the peak season flow of 0.1020 MGD, for a peak flow of 0.51MGD.

Estimates for wastewater flow must also include infiltration. A common limit for an acceptable level of infiltration in a sewer system is approximately 500 gallons per day per inch-mile of pipe.¹⁰ This results in an estimated infiltration rate of about 20,000 gallons per day, or 0.02 MGD. The WWTP must therefore be sized for an average flow of approximately 0.12 MGD, and a peak flow of 0.53 MGD.

Wastewater Treatment By-Products. A WWTP produces a solid product (sludge, or biosolids), and a liquid product (effluent) for disposal or reuse. The biosolids can be safely disposed at the County of Kauai's Kekaha Municipal Landfill, as the County does with the biosolids from its own wastewater treatment plants. The biosolids must pass a "Paint Filter Test" at the landfill to ensure that it is sufficiently dewatered prior to disposal. The biosolids can also be used in a small on-site composting operation. Combined with green waste generated from landscaping maintenance operations on the project, compost could then be reused for the development's landscaping.

Traditional options for disposal of effluent include ocean outfall, injection well, rapid infiltration and irrigation. The best possible use of the effluent, especially on the west side of Kauai, where weather is hot and dry and water is a precious resource, is to recycle the effluent as irrigation water. Irrigation will be the method of choice at Kapalawai.

The use of reclaimed water will be accomplished in compliance with the State Department of Health's *Guidelines for the Treatment and Use of Reclaimed Water*. If the effluent is treated to the R-1 level, it may be used to spray irrigate the project site with few restrictions, whereas R-2 quality effluent could be used for drip irrigation.

¹⁰ "Inch-mile" refers to total length of a certain diameter pipe. For example 5,280 lineal feet of 6-inch pipe is 6 inch-miles.

6.4 Grading and Drainage

A civil engineering report was prepared for the EIS by Wagner Engineering Services and included a discussion of grading and a preliminary drainage study. Their complete report is attached as Appendix I.

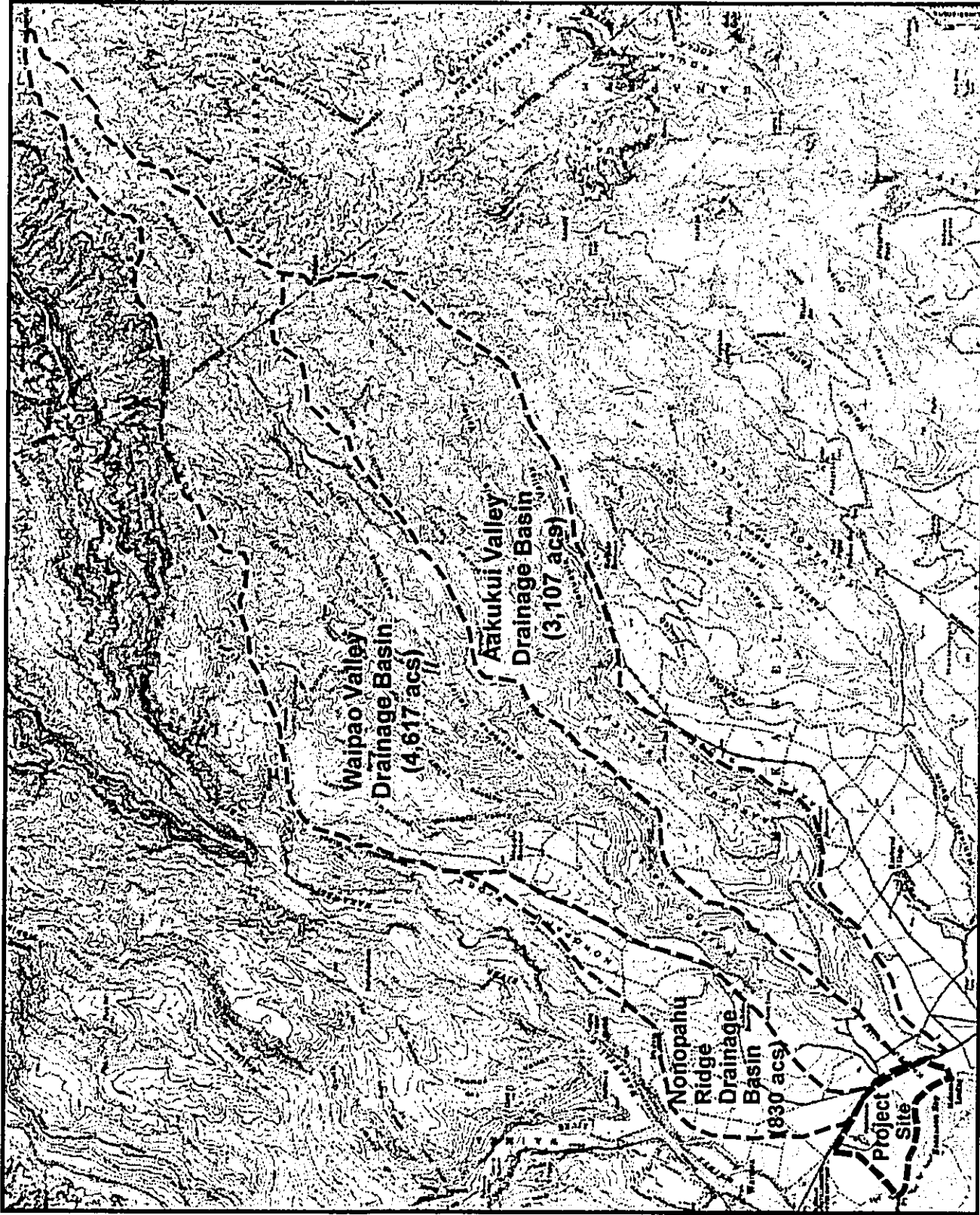
Existing Conditions

Off-Site Drainage. Three off-site drainage basins are tributary to the project site. According to the United States Geological Survey Map, Hanapepe Quadrangle, they are, from west to east, the Nonopahu Ridge drainage basin (830 acres), the Waipao Valley drainage basin (4,617 acres), and the Aakukui Valley drainage basin (3,107 acres) (Figure 24). All three drainage courses drain under Kaumualii Highway to the project site.

Nonopahu Ridge Drainage Basin. During the 100-year storm event, the Nonopahu Ridge drainage basin generates a peak flow of 1,578 cubic feet per second (cfs). Stormwater from the drainage basin sheetflows makai and is also collected in a manmade ditch found in the Gay & Robinson, Inc. Akia field system. Two existing 36-inch culverts convey runoff under Kaumualii Highway and into a manmade ditch on the western side of the project site. These culverts do not have the capacity to accommodate the 100-year storm event, so the highway will be overtopped during the 100-year event.

Waipao Valley Drainage Basin. During the 100-year storm event, the Waipao Valley drainage basin generates a peak flow of 5,491 cfs. The watercourse for the drainage basin is conveyed under an overpass on Kaumualii Highway, and then into a well defined, rock wall reinforced drainage channel (Mahaikona Stream), all the way to the ocean. The existing watercourse is approximately 36 feet wide, three to four feet deep, and clear of flow obstructions. During the 100-year storm event, the watercourse will overtop its banks.

Aakukui Valley Drainage Basin. During the 100-year storm event, this drainage basin generates a peak flow of 3,794 cfs. The drainage basin watercourse (Aakukui Stream) is conveyed under an overpass on Kaumualii Highway all the way to the ocean. The existing watercourse is approximately twelve feet wide, two to three feet deep, and overgrown in places. During the 100-year storm event, it is predicted that the watercourse will overtop its existing banks.

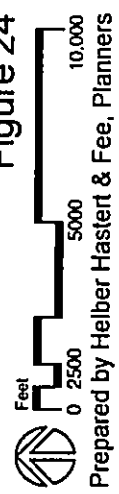


Off-Site Drainage Areas

KAPALAWAI RESORT

Kapalawai, Kauai, Hawaii

Figure 24



Prepared by Helber Hastert & Fee, Planners

Source: Wagner Engineering Services, 1999

On-Site Drainage. Aside from the three existing watercourses which traverse the project site, the remainder of the site slopes from the highway to the ocean at approximately four percent immediately makai of the highway, to approximately one percent at the shoreline. Sheet flow of the runoff to the ocean tends to minimize erosive effects on the property. Peak flow runoff for a 100-year storm event is approximately 310 cfs, which comprises about 2.7 percent of the total 11,173 cfs generated within the tributary drainage basins (including the project site) that reach the project site.

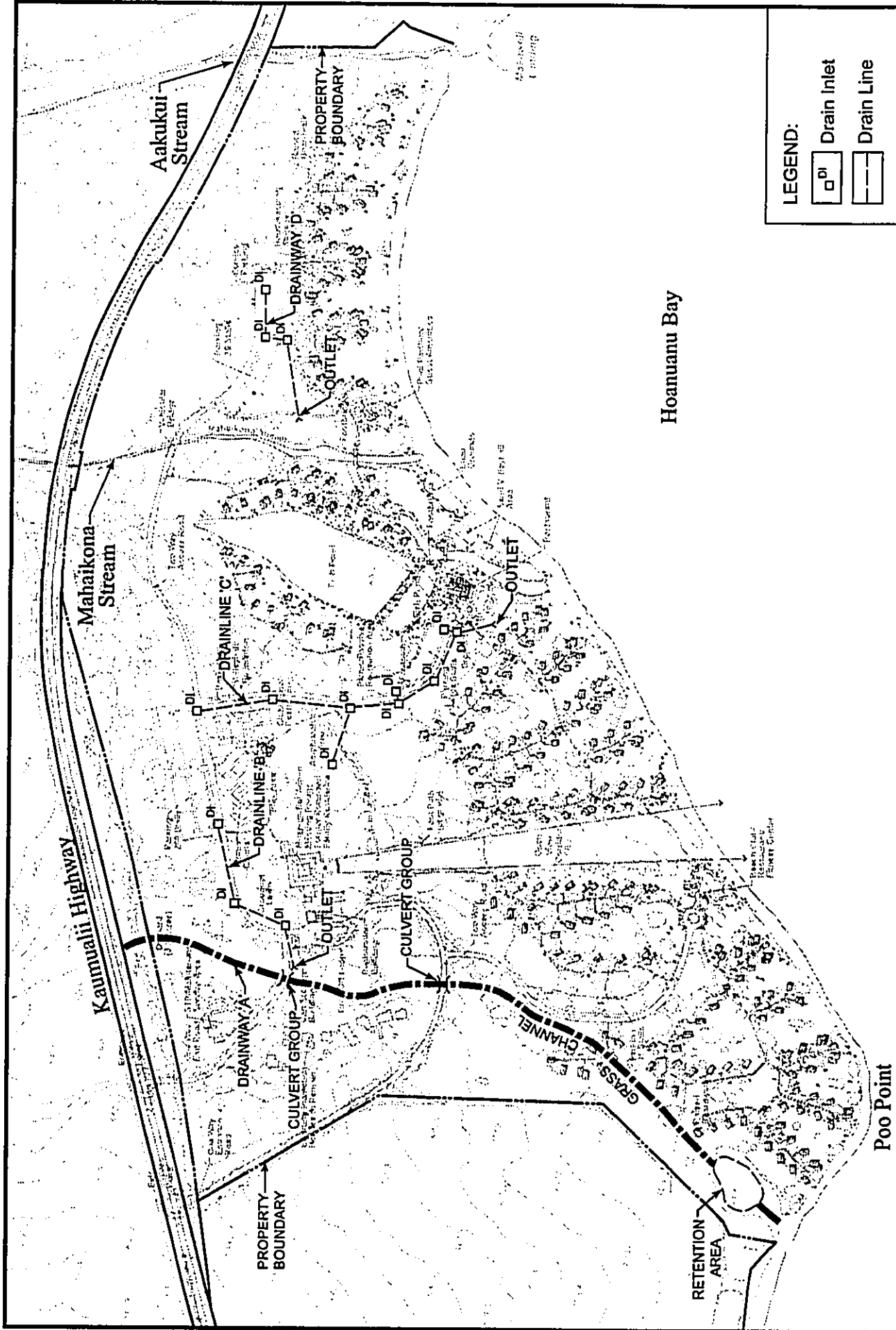
Makai of the highway the ditch discussed above continues and conveys runoff (and sugar cane irrigation filter discharge) to an area on the project site used as a settling basin by the plantation.

Gay & Robinson, Inc. is presently constructing a new retention basin mauka of the highway within the Nonopahu Ridge drainage basin for the collection of irrigation filter discharge and stormwater runoff. After settling, collected water will be pumped mauka for reuse. The retention basin will eliminate the irrigation discharge and most stormwater runoff from the Nonopahu Ridge System from reaching the project site.

Probable Impacts

Drainage systems are proposed in certain areas to control stormwater runoff for access roads and parking areas. Peak flow runoff for a 100-year storm event from the overall project site will increase from about 310 cfs in an undeveloped condition to about 589 cfs in a developed condition. The increase of 279 cfs for the 100-year storm event is insignificant (2.5%) when compared to the total peak offsite flow of 10,863 cfs from the three mauka watersheds which are tributary to the property. Therefore, impacts to near coastal water quality will not be significant.

Figure 25 illustrates a preliminary drainage plan for the proposed resort. Drainway "A" is a six-foot deep trapezoidal grass channel, with a bottom width of 30 feet and an overall top width of 54 feet. This drainway will follow the same draincourse as the existing man-made ditch. The new channel will route runoff through the west portion of the site and outlet into a retention basin mauka of the shoreline, which will allow for sediment collection and controlled release. This grass channel will accommodate the 100-year storm with two feet of freeboard.



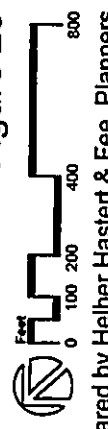
LEGEND:

	Drain Inlet
	Drain Line

Proposed Drainage System

KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii

Figure 25



Source: Wagner Engineering Services, 1999 Prepared by Helber Hastert & Fee, Planners

Drainline "B", is a storm drain system that will drain the western portion of the main parking lot. This drainline will empty into Drainway "A." Drainline "C," a storm drain system for the eastern portion of the main parking lot, the roadway to the main restaurant, and its parking lot, will outlet to an open lawn area downstream of the fishpond. Drain line "D," a storm drain system for the parking area and roadway on the eastern portion of the property, will outlet into Mahaikona Stream. The remainder of the site shall be graded to approximate the existing condition, to promote sheetflow runoff from the property.

Mitigation

Proper and regular maintenance of the existing streambeds and the proposed grass-lined channel is essential to ensure maximum flood protection for the project. Maintenance of Aakukui Stream, which is currently overgrown in some places, will significantly improve its capacity. Also, inclusion of best management practices (BMPs) in the design of the drainage system will reduce the potential for sediments and other pollutants to reach the ocean and on-site streams. These BMPs include: grass channels; filter strips; and bioretention areas. Other more direct options, such as sand filters, will also be considered. Selection of final BMPs, which could include a combination of those listed, will be made at the time of detailed project design.

6.5 Solid Waste

Existing Conditions

The County of Kauai's only municipal solid waste landfill is located in Kekaha, approximately seven miles to the northwest. The capacity and life span of the landfill was severely shortened after receiving waste and debris generated by Hurricane Iniki in 1992. At present, the landfill has approximately 5-1/2 years of capacity remaining.

Probable Impacts

Base upon other resorts in Hawaii, a project the size of Kapalawai can be expected to generate 70 to 90 cubic yards (cy) of waste per week.

Mitigation

According to the provisions of Article 7 (Landfills) of the Kauai County Code, the following materials are not allowed at the Kekaha Landfill from non-residential sources:

- Corrugated cardboard;
- Ferrous and non-ferrous metal objects;
- Loads with more than 20% green wastes; and
- Liquid waste.

The Kapalawai Resort will implement an aggressive recycling program to minimize its impact on the County's diminishing landfill capacity. Much of the 70 to 90 cy of solid waste anticipated for Kapalawai is recyclable, as follows:

**Table 9
Recyclable Waste**

Item	Primary Source	Approximate Weekly Volume
Cardboard	Delivery of packaged goods	5 to 10 cy
Glass	Food and beverage storage containers from restaurants	3 cy
Aluminum cans	Beverage containers	1 cy
Paper	Administration and registration offices	1 cy

Source: Wagner Engineering Services, 1999

Garden Island Disposal is the only commercial solid waste hauler on the Kauai. Garden Island has contracted with the County of Kauai to handle recycling of the above materials. The key to any successful recycling program is maintaining a clean, uncontaminated waste stream. The proposed resort should be able to recycle about 15% of its solid waste, as indicated above. In addition, the following items may also be diverted from the landfill:

- **Plastic.** Currently only number 2 plastics are recyclable on Kauai. Though not a significant portion of the waste stream, recycling of plastic fits in well as part of a larger recycling program, and may grow to include other types of plastic in the future.
- **Food Waste.** Restaurant food waste can be composted on-site and reused in project landscaping.

- **Green waste.** The volume of green waste generated from landscape maintenance can be significant. The green waste can be composted on-site, or delivered to the Kekaha landfill where the County of Kauai already has a green waste program in operation, provided the volume of green waste does not exceed 20% of any individual load.

Liquid wastes (other than wastewater) will be collected by a vendor and shipped off-island for recycling. In addition, the County of Kauai is currently evaluating proposals from private entities to handle large portions of the island's solid waste to avoid its placement in landfills.

6.6 Recreational Facilities

Existing Conditions

The West Kauai community is blessed with some of the most diverse and spectacular recreational resources in Hawaii. There are a number of federal, state, and county facilities that offer Kauai residents and visitors the opportunity to boat, fish, hike, swim, surf, picnic, camp, snorkel, and otherwise enjoy the outdoors. These facilities include:

**Table 10
Public Recreational Facilities in the Waimea District**

Federal Facilities¹¹	State Facilities	County Facilities
Nohili Point	Polihale State Park	Salt Pond Beach Park
Kinikini	Waimea Canyon State Park	Lucy Wright Beach Park
Majors Bay	Kokee State park	Kekaha Beach Park
	Na Pali Coast State Park	Hanapepe Beach Park
	Port Allen Small Boat Harbor	
	Kikiaola Small Boat Harbor	

In addition, as discussed in Section 6.7, below (Shoreline Access), access to the shoreline is provided through the project site to the "Pakalas" ("Infinities") surf break.

¹¹ These facilities all represent beach access through the U.S. Navy's Pacific Missile Range Facility at Barking Sands

Probable Impacts

The existing recreational resources in West Kauai are diverse, vast, and exceptional, and contribute to the overall quality of life for its residents. The addition of about 365 persons per day (Kapalawai Resort guests on an average day) to the defacto population of the Waimea District, will add to the demand on recreational resources. However 365 people represent only a 3.9% increase above the 1995 resident population of 9,220 for the Waimea District, and a 0.5% increase to the defacto population of 69,900 for the entire island (Department of Business Economic Development and Tourism, 1996). Many of the recreational facilities in the Waimea District (such as Waimea Canyon State Park, Kokee State Park, Na Pali Coast State Park, Polihale State Park) attract users from all over Kauai, including visitors. In this context, the increased demand resulting from potential Kapalawai Resort guests will be marginal. This is particularly evident when examining the area of many of these facilities. For example, Kokee State Park and Waimea Canyon State Park are 4,345 acres and 1,866 acres in size, respectively, and offer numerous hiking, picnicking, hunting, and camping opportunities.

The project site will offer some recreational amenities to guests, thereby minimizing off-site impacts. These activities include tennis, swimming, beachcombing and walking. Therefore, some recreational demand for Kapalawai guests will be met on the property. As a result, overall impact to any single off-site recreational resource is not expected to be significant.

The development of a resort at Kapalawai will also provide on-site recreational opportunities for Kauai residents, in the form of increased shoreline access (Section 6.7, below), to pursue activities such as fishing, diving, beachcombing, and picnicking, in addition to surfing. As a result, there will be a beneficial impact on recreational opportunities for Kauai residents.

6.7 Shoreline Access

Existing Conditions

At the present time, there is an informal agreement between the Robinson family and the County of Kauai that allows beachgoers access to the shoreline on the southern side of the project site in the vicinity of Aakukui Stream. This access is primarily for surfers who want surf at Pakalas. Other shoreline access in the

region is provided at various Federal, State, and, County beach facilities from Hanapepe to Polihale.

Probable Impacts

At the very least, current access to the Pakalas surf break will remain as-is. Discussions with community members indicate there may be a difference of opinion concerning the most appropriate form of beach facilities for Kapalawai at the Aakukui Stream end of the property. Various facilities have been proposed including, a parking area, restroom, shower, and a formal path to the ocean. Other suggestions have been to leave the current access as-is, with no additional formal facilities.

Additional access will be available from parking areas within the resort, where some parking spaces will be reserved for public use. In this context, access to the shoreline will be improved.

Mitigation

Discussions with community representatives, officials from the County of Kauai, the landowners, and the developers are necessary to develop an overall access plan for the property that meets the needs of the community and satisfies the requirements of Chapter 205A, HRS.

6.8 Police/Fire and Emergency Services

Existing Conditions

Police. The Waimea District (Hanapepe-Polihale/Kokee) has one beat officer on patrol at any time. There are three nine-hour shifts (6am-3pm, etc.), so there is some overlap between the patrol officers. One sergeant oversees four officers from Koloa to Polihale, and provides backup to the beat officers during evening and late night shifts. During the day shift, the district commander takes care of administrative matters at the Waimea Substation, and provides additional backup response to the beat officer and sergeant.

Existing police manning and facilities are adequate to serve current conditions (Ihu, Personal Communication, Sept. 28, 1999).

Fire. Fire protection services are provided by Station 6 in Hanapepe and Station 7 in Waimea. Either or both stations would respond to structural fires on the property. Only Station 7 would respond to brush fires, unless additional back up was required. Each station has a 5-man crew. Response time from Waimea to the project site would be about 3 minutes; from Hanapepe about 6 minutes (Kanno, Personal Communication, Sept. 28, 1999).

Emergency Services. Emergency services on Kauai are contracted by the State to American Medical Response. The Waimea unit ("Medic 20") serves the project area. Its service area runs from Polihale and Kokee in the west to near Kalaheo in the east. It is an advanced life support unit with one paramedic and one emergency medical technician (EMT). The unit usually transports patients to Kauai Veterans Memorial Hospital I Waimea. Severe trauma and isolated orthopedic cases are transported to Wilcox Hospital in Lihue, or to Honolulu (Maiava, Personal Communication, Sept. 29, 1999).

The Waimea unit responds to about 280 calls per year, or 31 calls per 1,000 population. This is the lowest incident rate on Kauai. The average response time of 10.5 minutes is considered excellent. If backup response is needed (e.g., the unit is already on a call), the Poipu unit will respond. The Fire Department co-responds on all calls (Maiava, Personal Communication, Sept. 29, 1999).

Probable Impacts

Police. The Police Department has indicated that there are problems in the district with car break-ins in isolated areas. Increased traffic in the region could result in more traffic accidents. (Ihu, Personal Communication, Sept. 28, 1999). However, having on-site security personnel would reduce impact to police services. In general, impacts to police services are not anticipated to be significant, provided the resort provides on-site security, based on experience with other facilities in Koloa and Poipu.

Fire. The Fire Department has indicated that if the developer provides a private fire protection system consisting of storage tanks, lines, stand pipes, and access roads (to the cottages), existing fire protection equipment and manning should be sufficient to serve the development. (Kanno, Personal Communication, Sept. 28, 1999).

Emergency Services. Emergency services staff indicated the proposed project would not require the addition of staff or equipment to the Waimea Unit.

6.9 Interrelationships and Cumulative Impact: Public Facilities and Service

The proposed resort will have marginal impacts to the public facilities and services of the region. Electricity and phone services are adequate to meet demand. Wastewater treatment will occur on-site, with reclaimed water being recycled as an irrigation source. Potable and irrigation water will be provided with the development of a private source and delivery system. Traffic will increase slightly in the vicinity of the resort, including consideration of general increases in traffic attributable to background growth. Impacts will be mitigated by the construction of improvements to Kaumualii Highway at the entry to the resort. However, longer-range development on West Kauai could include another low-density resort of similar size to the proposed project, on land owned by Kikiaola Land Company. Development of a second resort could require traffic improvements within Waimea Town.

Recycling efforts will keep generation of solid waste to a minimum. Shoreline access will be improved with the provision of on-site parking.

Wastewater generated by the project will be handled via an on-site wastewater treatment plant, with effluent recycled on the property as irrigation water. Hence, impacts are limited to project boundaries.

Other utility demands are modest, and can be met by existing infrastructure systems. There are no pending projects that would otherwise require upgrading capacity.

As more properties return to visitor facility inventories, and new properties develop additional visitor units (Alexander & Baldwin's Kukuiula project), there will be an increase in the number of visitors who travel to West Kauai for sightseeing from other areas on Kauai. These visitors will increase the number of people at some recreational facilities, particularly the larger, more spectacular attractions such as Kokee State Park, Waimea Canyon State Park, and Polihale Beach Park. Other recreational facilities, such as County beach parks, should not be impacted as much.

Police/Fire and Emergency Service infrastructure appear adequate for the foreseeable future.



7

ALTERNATIVES TO THE PROPOSED ACTION

7.0 ALTERNATIVES TO THE PROPOSED ACTION

As discussed in Chapter 1, four development alternatives and one non-development alternative ("no-action") were considered in place of the proposed action. Each of the alternatives discussed represents a realistic concept to develop the property. Each of these alternatives is discussed below, including the major anticipated impacts of each alternative as compared to the proposed action.

Although the no-action alternative was considered, it was determined to be an unrealistic expectation of the landowner's ultimate disposition of the property. It is appropriate to assume, and within the rights of the landowner to expect, that the property will realize a return. Thus, eventual development of the property will occur. While some of the alternatives are more feasible than others, none compared to the proposed project in terms of impacts to the environment. For this reason, the proposed action was determined to be the best use of property with the least impact.

7.1 High Density Resort

The overall density of the proposed resort is approximately 1.5 units per acre. The property is capable of handling much higher densities. If buildings containing conventional hotel rooms were constructed at 4-6 stories, it would be possible to accommodate 1,700 hotel rooms on the property, which would be consistent with the RR-10 Hotel Zoning District. A resort of this size would also include some commercial space, a number of restaurants, and a greater number of recreational amenities on-site.

Traffic impacts would be significantly greater than the proposed action. Signalization would probably be required on Kaunualii Highway, and intersections in Hanapepe and Waimea Town would also be negatively affected. Physical changes to property would be more severe, with much larger building footprints required, resulting in greater excavation, and a higher percentage of impervious surfaces devoted to roadways and parking areas. Higher investments would be required to provide adequate wastewater treatment and potable water.

In addition, the overall volume of employees and guests would overwhelm Waimea Town, and would require the evaluation of existing County and State services in the region.

7.2 Golf Course

The overall size of the project site (~~170~~ 153.696 acres) is suitable to accommodate a golf course. Under this development scenario, the former family residence could be preserved and used as a clubhouse, and the fishpond could be incorporated into the course as a water feature. It is probable that sufficient water for irrigation would be available from the fishpond.

If a golf course were developed, the property would retain its character as open space, although it would require a much more intensive level of management in order to maintain the health and integrity of the course turf. The course could be designed to accommodate significant storm events on-site without sheet flow into the ocean. Although golf courses require the application of fertilizers and pesticides to promote turf health, recent trends in golf course management limit the leaching of these chemicals to groundwater, and eventual seepage to the nearshore marine environment.

Although the overall environmental impacts of a golf course are favorably compared to the proposed action, the economics of golf course construction and maintenance as stand-alone developments are questionable in today's market conditions. Therefore, a golf course was not considered as the most appropriate use of the property.

7.3 Mixed Use Resort/Commercial/Residential

A mixed use development is typical of many areas in Hawaii, such as Kapalua, Wailea, Kaanapali, and Poipu. This type of resort is considered more of a "self-contained" unit, and attempts to keep its guests within the resort. This allows the resort to capture dollars spent by its guests, instead of promoting guests to spend dollars outside of the resort, within the regional community. The overall scale of this type of development would be consistent with the scale discussed in Section 7.1 (High Density Resort), and environmental impacts would be similar. In addition, in terms of economic impact, there would be a higher percentage of expenditures that "leaked" out of the region.

One objective of the developer of the proposed resort is to provide economic stimulus to existing local businesses and service providers, in addition to creating new opportunities for local entrepreneurs. The development of a higher density mixed use project does not meet these objectives.

7.4 Residential Development

Another possible use of the property would be to create a residential subdivision. If an average lot size of 10,000 to 15,000 square feet is achieved, it would be realistic to estimate upwards of 300 lots available for residential development. The immediate impact of 300 single-family dwellings (assuming there is a market for that many homes), would be to add over 600 people to the resident population of the Waimea District. In terms of physical environmental impacts, development of a residential subdivision would be similar in nature to a high density resort. Traffic impacts would not be as significant. However, project area devoted to roadways and sidewalks would be probably be higher, resulting in increased stormwater runoff. In addition, 300 individual properties with extensive lawn areas would result in a large variance in fertilizer and pesticide application, with some property owners using considerably more chemicals than actually required. Also, the number of new permanent residents would place heavier burdens on public infrastructure systems, including wastewater treatment, potable water, and public schools.

Further, the historic context of the family residence and the fishpond would be significantly compromised. For these reasons, this alternative was rejected.

7.5 No-Action

The no-action alternative would leave the property in its present condition. Two immediate consequences of the no-action alternative would be that: (1) the Robinson family would have to continue expend resources to maintain the present condition of the former family residence, or it would deteriorate; and (2) the condition of the fishpond would continue to degrade with the accumulation of silt and noxious vegetation, resulting in the ultimate loss of this resource. These two consequences are not acceptable to the Robinson family, and, therefore, do not meet their objectives for the long-term management of the property.

A third consequence of the no-action alternative would be that the balance of the property formerly used as pasturage for livestock would become available for that use once again, allowing for limited agricultural use of the property. The number of bulls formerly accommodated on the property was limited in number (20), and other pasturage, of higher quality, is available to be used for this purpose. In addition, the remainder of the property would continue to be overgrown with vegetation, and would not be managed in a manner meeting the Robinson family's expectations.

For these reasons, the no-action alternative was rejected.



8

IRREVERSIBLE
AND IRRETRIEVABLE
COMMITMENTS
OF RESOURCES

8.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The construction of the proposed project will result in an irreversible and irretrievable commitment of capital, labor and energy for the design and construction of the project. In addition, the operation of the resort will require the expenditure of energy and the consumption of some natural resources.

However, the overall project should also be seen in the context of how operations strive to reduce commitments of resources. Wastewater reclamation, and other recycling activities, not only reduce overall consumption, but will educate guests about the opportunities to reduce consumption in their daily lives when they return home.

Although land will be used and occupied during the development and operation of the project, the overall character of the property will remain in open space. The point is that development of the project site as proposed offers a low-impact use of the property (particularly in contrast to alternative uses) which would operate on a basis of low resource consumption and recyclability.



9

RELATIONSHIP BETWEEN
LOCAL SHORT-TERM USES
OF THE ENVIRONMENT
AND MAINTENANCE
AND ENHANCEMENT
OF LONG-TERM
PRODUCTIVITY

9.0 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The undeveloped nature of the project site suggests a low level of use and environmental impact. In addition, during the last few decades, management of the property has been reduced, resulting in a degradation of the fishpond, and continued growth of non-native species, including the recent discovery of a particularly destructive species of kiawe, which has gained a foothold on the makai portions of the property. The long-term benefits of the development of a low-density resort at Kapalawai will include:

The fishpond will be improved and managed, providing appropriate habitat for endangered native waterbirds;

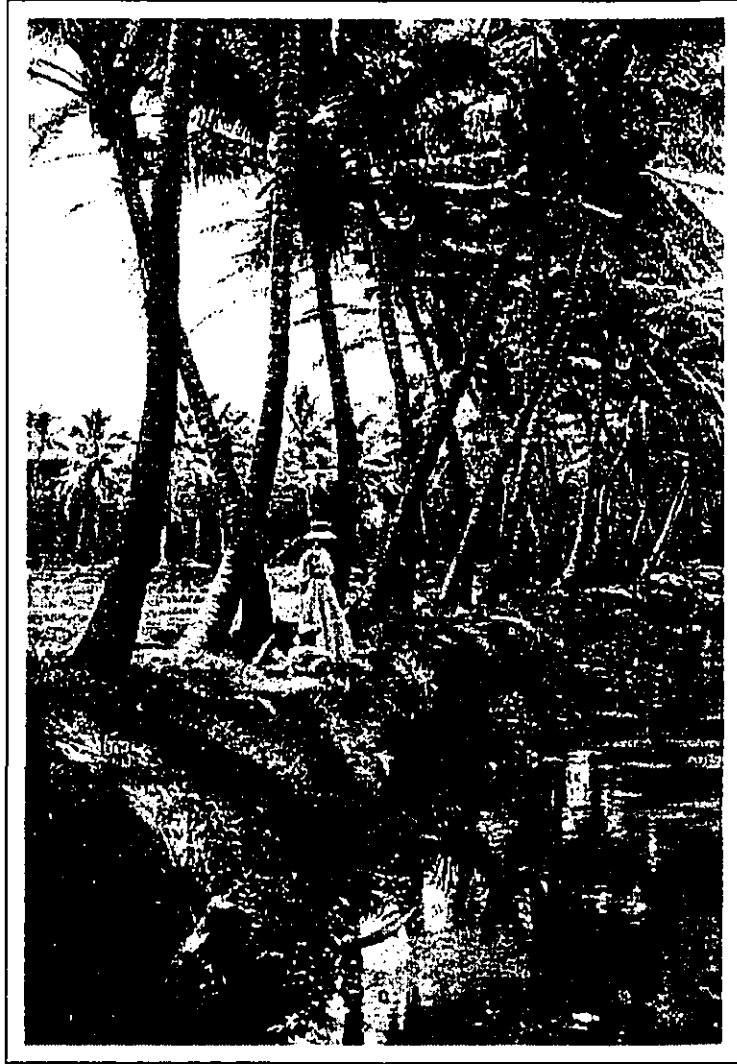
The grounds of property will also be managed, reducing the exposure of soil to the effects of erosion, thereby reducing impacts to the nearshore environment related to sedimentation;

The former Robinson family residence will be renovated, restored, and maintained, with a major portion of its floor area devoted to a museum, thereby preserving an important aspect of the history of Kauai and the State of Hawaii;

The project will generate about 200 jobs on-site, and over \$36 million in annual expenditures, statewide;

The Kapalawai Resort will support agricultural operations in the region, thus enhancing the long-term productivity of the agricultural sector; and

Recycling efforts, including wastewater reclamation, will reduce consumption of natural resources.



10

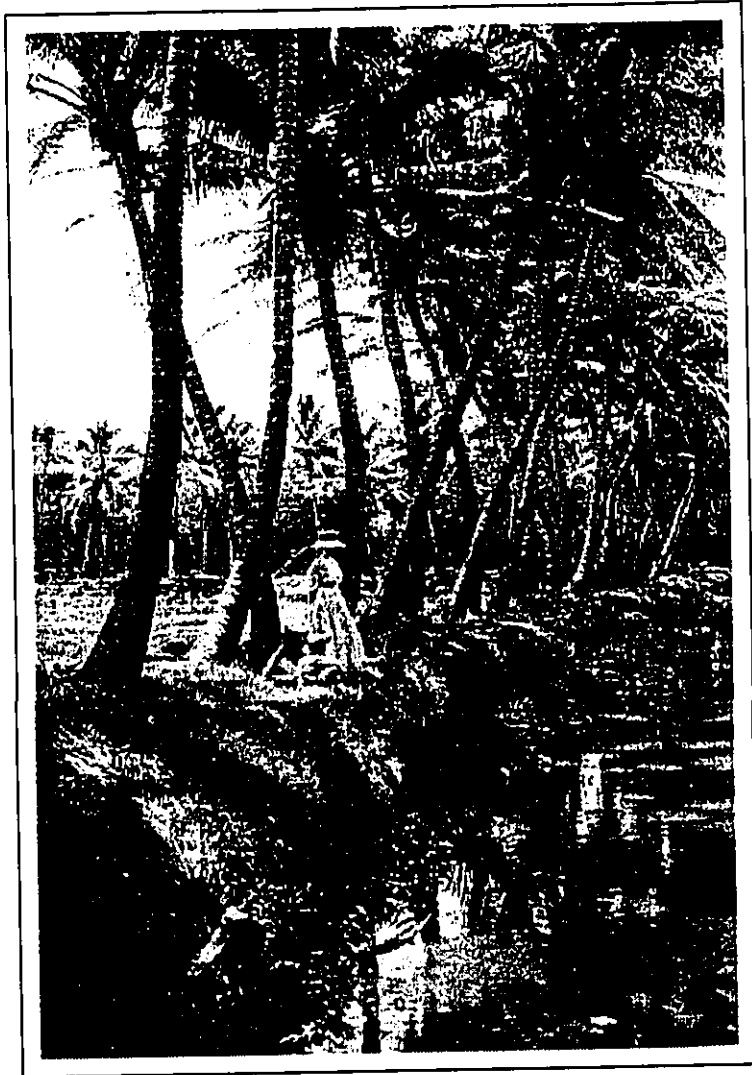
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11

PREPARERS OF THE EIS

11.0 PREPARERS OF THE EIS

This environmental impact statement was prepared for the applicant, Destination Villages Kauai, LLC by Helber Hastert & Fee, Planners. The following list identifies individuals and organizations involved in the preparation of this EIS and their respective contributions.

Helber Hastert & Fee, Planners

Scott Ezer (Project Manager and Principal Author)

Michael Garris (Physical Planning)

Sherrie Dodo/Lori Oumaye (Graphic Presentation)

Technical Consultants

Consultant

Char & Associates
 Phil Bruner
 Marine Research Consultants
 Cultural Surveys Hawaii
 Tom Nance Water Resources Engineering
 Wagner Engineering Services
 Cultural Surveys Hawaii
 Mikiko Corporation
 Wilbur Smith Associates
 Mason Architects

Technical Area

Botanical Resources
 Terrestrial Fauna
 Marine Biology
 Archaeology
 Hydrogeology
 Civil Engineering/Surveying
 Traditional Cultural Practices
 Fiscal/Economic Impact
 Traffic Analysis
 Architectural Analysis of Structures



12

PARTIES CONSULTED
DURING THE PREPARATION
OF THE
DRAFT ENVIRONMENTAL
IMPACT STATEMENT

12.0 PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

The County of Kauai of Planning Department (accepting authority) determined that the proposed project may have a significant effect on the environment. By letter dated July 9, 1999, the Planning Department notified the Office of Environmental Quality Control (OEQC) that it had determined an EIS was required for the project. Notice of this determination was published in the July 23, 1999 edition of the *Environmental Notice*, commencing a 30-day public review period that ended on August 23, 1999. A copy of the environmental impact statement preparation notice (EISPN) and/or notice of the project was mailed to the agencies and organizations listed below. The list contains parties believed to have an interest in the project.

A total of 23 agencies, organizations, or individuals provided written comments on the EISPN. The parties who responded to the EISPN are identified by an asterisk (*) and their respective comments are reproduced in the following pages, along with response letters to the comments. Parties identified by a double asterisk (**) were not on the original mailing list but sent in comments or requested to be considered a consulted party.

Elected Representatives

The Honorable Avery B. Chumbley, Hawaii State Senator District 6
 The Honorable Jonathan Chun, Hawaii State Senator, District 7
 The Honorable Hermina Morita, Hawaii State Representative, District 12
 The Honorable Ezra Kanofo, Hawaii State Representative, District 13
 The Honorable Bertha Kawakami, Hawaii State Representative, District 14
 The Honorable Maryanne W. Kusaka, Mayor, County of Kauai
 The Honorable Ronald Kouchi, Chair, Kauai County Council
 The Honorable Bryan J. Baptiste, Kauai County Council
 The Honorable Gary Hooser, Kauai County Council
 The Honorable Daryl Kaneshiro, Kauai County Council
 The Honorable William Swain, Kauai County Council
 The Honorable James Kunane Tokioka, Kauai County Council
 The Honorable Randal Valenciano, Kauai County Council

Federal Agencies

Department of Agriculture, Soil Conservation Service
 Department of Defense
 Department of the Army, Army Corps of Engineers*
 Department of the Navy, Pacific Missile Range Facility, Barking Sands
 Department of the Interior
 Fish and Wildlife Service*
 Geological Survey*
 Department of Commerce
 National Marine Fisheries Service*

State Agencies

Department of Accounting and General Services*
Department of Agriculture
Department of Business, Economic Development, and Tourism
 Land Use Commission*
 Librarian, DBEDT Library
 Office of Planning*
 State Energy Office*
Department of Defense*
Department of Education
 Superintendent*
 Hawaii State Library
 Hanapepe Public Library
 Waimea Public Library
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 Kapaa Library
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 Lihue Regional Library
 Hawaii Kai Regional Library
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 Hilo Regional Library
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Department of Hawaiian Home Lands*
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 Historic Preservation Division*
Department of Transportation*
Office of Hawaiian Affairs*
Legislative Reference Bureau
University of Hawaii
 Environmental Center
 Hamilton Library
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County of Kauai Agencies

Office of the County Attorney
Fire Department*
Department of Planning
 Chair, Planning Commission
 Historic Preservation Review Commission
Police Department
Department of Public Works*
Department of Water*
Civil Defense Agency*
Office of Economic Development

Public Utilities

GTE Hawaiian Tel*
Kauai Electric Company

Community Organizations/Individuals

Amfac Sugar Company
Hanapepe Business Association
Hanapepe Bay Association
Hanapepe Professional Businessmen's Association
Hanapepe Economic Alliance, Inc.
ILWU (Kauai Division)
Judy Naumu Stewart
Kauai Chamber of Commerce
Kauai Economic Development Board
Kauai Visitors Bureau
Kikiaola Land Co., Ltd.
Life of the Land*
Sierra Club
West Kauai Development Corporation
West Kauai Main Street
Dorothea Hayashi**

Newspapers

The Garden Island Newspaper
Kauai Business Report
Honolulu Advertiser
Honolulu Star-Bulletin

PHONE (808) 594-1888

FAX (808) 594-1865



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

August 23, 1999

Mr. Keith Nitta
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, HI 96766

EIS #329 (99)

Re: Environmental Impact Statement Preparation Notice (EISPN)
Kapalawai Resort, TMK: (4) 1-7-05:01

Dear Mr. Nitta,

Thank you for the opportunity to comment on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Kapalawai Resort in Makaweli, Kauai, Hawaii. The 170-acre project site will include 250 visitor units with no cooking facilities, phones, or televisions. In addition, amenities such as: two restaurants; a snackbar; museum; bar/lounge; three swimming pools; fitness center/beach club; sport courts; and an amphitheater will be provided.

According to the EISPN, the Hawaiian Islands are vulnerable to hurricanes, especially the island of Kauai which suffered tremendous damage from Iwa (1982) and Iniki (1992). The coastal area of the proposed project site is within the Hurricane Iniki Inundation. The Office of Hawaiian Affairs (OHA) suggests the creation of a mitigation plan for the proposed resort site in the event of another hurricane.

Also, 30% of the project site is considered "Prime" agricultural land. It would be inappropriate to rezone this portion of agricultural land. Moreover, the State of Hawaii classifies that resort uses are not permitted on Agricultural and Conservation Districts, and Open or Agricultural Zoning Districts for the County of Kauai.

According to the botanical survey done on the project site in March 1999, none of the plants on the project site are threatened or endangered. However, shrubs of the native *tiima* are common on the project area.

Mr. Keith Nitta
August 23, 1999
PAGE 2

In addition, no native land-birds were recorded during a survey conducted in March 1999, by Phillip Bruner. However, the Hawaiian Duck or *Koloa*, and the endemic Hawaiian Hoary Bat were observed during the survey.

The Office of Hawaiian Affairs (OHA) urges that appropriate mitigative efforts be taken to preserve Hawaii's native flora and fauna. OHA anticipates the draft Environmental Impact Statement (EIS) for our further review and comment of the botanical and avifaunal surveys conducted on the project site.

In addition, five archaeological sites in the project area were identified and recorded with the State Historic Preservation Division (SHPD). Again, OHA urges that appropriate mitigative efforts be taken to preserve these sites. We anticipate the Draft EIS for our further review and comment of the draft archaeological inventory survey conducted on the project site.

OHA urges that a cultural impact statement with detailed sections on gathering and religious rights be prepared and included with the Draft EIS. In addition, we suggest that the Hawaiian cultural expert chosen to work on the statement should be a person who is recognized within the Hawaiian community for their cultural expertise. The concerns of the community will not be addressed if the cultural impact statement contains information and analysis provided solely by a person whose knowledge of Hawaiian culture is limited to a study of archaeology or anthropology.

Lastly, since shoreline resources must be made available to the public, we suggest there should be a formal agreement between the developers of the project and the County of Kauai to provide for public access to the shoreline.

If you have any questions, please contact Mark A. Mararagan, Policy Analyst-Government Regulations at 594-1945.

Sincerely,

C. Sebastian Abood
Hawaiian Rights Division Director
Colin Kippen
Deputy Administrator

cc: OHA Board of Trustees
Mr. Lewis Geyser, Destination Villages Kauai, LLC
Mr. Scott Ezer, Helbert Hastert & Fee, Planners
Kauai CAC

Helber Haster
Planners

November 5, 1999

Mr. C. Sebastian Aboot, Hawaiian Rights Division Director
Mr. Colin Kippen, Deputy Administrator
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813-5249

Dear Messieurs Aboot and Kippen:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 23, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

For ease of reference, we will respond to comments in the order they appear in your letter.

Hurricane Inundation. The DEIS will include a discussion of coastal inundation related to Hurricane Iniki. We obtained aerial photos of the project site taken a week after the hurricane, which clearly shows the mauka reach of the Iniki storm surge. Structures will be setback beyond this area. The State Department of Defense has recommended that a warning siren be erected on the property for the safety of resort employees and guests.

Agricultural Land. The area of the project site designated as "Prime" under the Agricultural Lands of Importance to the State of Hawaii (ALISH) rating system surrounds the residential compound. Because this land has been used by the Robinson family for residential and related purposes since 1897, this land has never been used for commercial agriculture, and is of negligible importance to agricultural production. In order to incorporate the several buildings of the residential complex into the resort, the State land use designation will need to be changed. This is of critical importance in consideration of the need to preserve these valuable historic resources.

"Ilima. The complete botanical survey prepared for the project by Char & Associates will be appended to the DEIS. In addition to the 'ilima, several other native plants were found on the property, including po'uuehue, kupala, naupeka kahakai, milo, 'ilie'e, and 'aki'aki, among others.

Helber Haster & F
Greenway Center, Makai Tower
733 Hihopu Street, Suite 2570
Honolulu, Hawaii 96813
Telephone: 808 545-2055
Facsimile: 808 545-2050

Helber Haster
Planners

Mr. C. Sebastian Aboot
Mr. Colin Kippen
November 5, 1999
Page 2

Historic Sites. The five historic sites identified during the archaeological inventory survey will be preserved. Several will be incorporated into the development program of the resort, and others will be preserved "as-is." The archaeological inventory survey will also be appended to the DEIS.

Cultural Impact. The firm of Cultural Surveys Hawaii also prepared a traditional customs and practices report, which will be appended to the DEIS.

Shoreline Access. Section 6.7 of the DEIS will discuss current and future considerations for shoreline access. We have suggested that final determination of an acceptable method of formal shoreline access on the eastern end of the property needs to be resolved. There are differing views in the community concerning how access should be provided, and what kinds of facilities are appropriate in the area, if any at all. We believe that a thorough discussion of this issue between community representatives (including surfers), county officials, the landowners, and the developer will be necessary to develop a plan that is acceptable to a majority of stakeholders.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

BENJAMIN J. CAVEIANO
DEPUTY DIRECTOR
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DIRECTOR
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Telephone: (808) 587-2946
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OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Ref. No. P-8230

August 16, 1999

Mr. Dee Crowell
Director
Planning Department
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Attention: Keith Nitta

Dear Mr. Crowell:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kapalawai Resort, Waimea, Island of Kauai, TMK (4) 1-7-05:01

The proposed resort includes 250 visitor cottages dispersed throughout the 170-acre site. The project would restore the former homestead of the Robinson family, the fishpond, and grounds as a reflection to a bygone era in Kauai's history. Resort amenities include two restaurants, snack bar, museum (in the homestead), bar/lounge (in the homestead), three swimming pools, fitness center/beach club, sport courts (tennis, basketball, volleyball, badminton) and amphitheater. We have reviewed the project and have the following comments.

The property extends along the shoreline for approximately one mile and is within the Agriculture and Conservation State Land Use Districts. A narrow band along the shoreline is within the Conservation District. The remainder is in the Agricultural District. A State Land Use District Boundary Amendment must be obtained from the State Land Use Commission. The EISPN should discuss the number of jobs created during the construction and operation of the resort at buildout and the adequacy of existing and/or planned affordable housing to meet demand. The EISPN should discuss the project's impact on existing schools from workers (construction and operational) moving into the nearby communities and the impact on diversified agricultural pursuits, land availability and agricultural labor resources.

The State Land Use Five-Year Boundary Review recommended reclassification of Russian Fort Elizabeth State Historical Park from the Agricultural District to the Conservation District. The EISPN should discuss the impacts of the resort on this adjacent resource. There should also be a discussion on the lessee and/or fee owner's plans for the remainder of the property (approximately 20 acres) which, if left undeveloped, would buffer Russian Fort Elizabeth State Historical Park from the proposed resort.

Mr. Dee Crowell
Page 2
August 16, 1999

We commend the restoration of the 6.5-acre fishpond that is presently half-filled with silt and overgrown vegetation. The fishpond, Aaukui Stream, and Mahiokona Stream and existing wetland areas on the property are habitats for the endangered Common Moorhen (*Gallinula chloropus*) and the endangered Hawaiian Duck (*Anas wyvilliana*). The native Black-crowned Night Herons (*Nycticorax nycticorax*) were also found on the property. We hope the restoration of the fishpond and sensitive landscaping of the streams and wetland areas would encourage native wildlife. The EISPN should discuss best management practices as outlined in Hawaii's Coastal Nonpoint Pollution Control Program Management Plan to mitigate contamination of coastal waters and wetland resources from construction debris, drainage, and chemical/pesticides used for ground maintenance.

The following should also be addressed in the EISPN:

- A shoreline access plan from the highway for swimmers, fishermen, and other recreational or traditional users.
- A plan to incorporate recycling provisions within the project during the construction and completed phases of the project.
- Evacuation/protection plans to ensure the safety of visitors during emergencies (tsunamis, hurricanes).
- Documentation of community support for the project.
- The relationship of the project to various plans and policies: State Tourism Plan, County General Plan, State Plan, and the Coastal Zone Management objectives and policies.

If there are any questions, please contact Christina Meller of our Coastal Zone Management Program at 587-2845 and Judith Henry of our Land Use Division at 587-2803.

Sincerely,

David W. Blane
Director
Office of Planning

c: Office of Environmental Quality Control
Destination Villages Kauai, LLC
↓ Helber Hastert & Fee

Heller-Hanstert
Planners

November 5, 1999

Mr. David Blane
Director
Office of Planning
Department of Business, Economic Development & Tourism
235 South Beretania Street, 6th Floor
Honolulu, HI 96813

Dear Mr. Blane:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 16, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared. For your ease of reference, we will respond to your comments in the order they appear in your letter.

State Land Use District Boundary Amendment. We acknowledge the requirement to petition for a State Land Use Boundary Amendment for the proposed resort. We intend to keep the strip of land mauka of the shoreline within the Conservation District. We will ask to designate the remainder of the property as Urban.

Jobs/Population. A fiscal and economic impact assessment was prepared for the project by Mitoko Corporation. The findings of this report will be described in the DEIS, and the entire report will be appended to the DEIS. In response to your question, we estimate that approximately 710 person-years of labor for construction at Kapalawai, and about 200 full time equivalent positions will be created for the operation of the resort. In-migration will be negligible, and we anticipate that most jobs will be filled by Kauai residents. Therefore, there will be no significant impacts to area schools.

Diversified Agriculture. The project site has never been used for commercial agriculture. As such, no land will be taken out of agricultural production. There are eight plantation-era homes on the property that will remain. Four of these homes are currently occupied, and there is some subsistence crop growing by these residents, which will continue.

Heller-Hanstert & Co.
Governor Center, Makai Tower

733 Bishop Street, Suite 2500
Honolulu, Hawaii 96813

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Facsimile: (808) 545-2029

Heller-Hanstert
Planners

Mr. David Blane
November 5, 1999
Page 2

Russian Fort Elizabeth State Historical Park. This park is approximately ¼ mile west of the project site. The area between the two parcels is currently in active agricultural production, and there are no plans to discontinue these activities. As such, there will be a significant buffer between the properties. The area of the land in agricultural production is closer to 85 acres, rather than 20 acres.

Best Management Practices. During construction, traditional best management practices will be employed to reduce wind erosion and fugitive dust, such as: watering exposed soil; covering all moving, open-bodied trucks transporting materials which may result in fugitive dust; use of wind screens; prompt removal of earth or other temporarily stockpiled material; and limiting the land area exposed by construction. Drainage systems will be designed to retain stormwater on-site to allow for settling of sediment before reaching the ocean. Plant materials will be selected for their ability to tolerate the locally dry climate, thus reducing requirements for fertilizer and pesticides. Native species will be given the highest priority during the development of a landscape plan for the project site.

Shoreline Access Plan. Section 6.7 of the DEIS will discuss current and future considerations for shoreline access. We have suggested that final determination of an acceptable method of formal shoreline access on the eastern end of the property needs to be resolved. There are differing views in the community concerning how access should be resolved, and what kinds of facilities should be provided in the area, if any at all. We believe that a thorough discussion of this issue between community representatives, county officials, the landowners, and the developer will be necessary to develop a plan that is acceptable to a majority of stakeholders.

Recycling. Recycling will be a fundamental operating principle for the resort. Reclaimed water from the on-site wastewater treatment plant will be reused as irrigation on the property. Green waste will be composted and reused. An aggressive recycling program for other solid waste will also be implemented (cans, bottles, paper, plastic), to reduce solid waste volume.

Evacuation/protection. The State Department of Defense has recommended that the project install a warning siren on the property for the safety of resort employees, guests, and others in the region. Regional shelters and evacuation routes will be included in printed materials that are placed in all cottages, and all



Helber Haster &
FEE, Planners

Mr. David Blane
November 5, 1999
Page 3

employees will be made aware of these plans during training periods before beginning work.

Documentation of Community Support. We have had several meetings and open forums within the West Kauai community to present the project to the community and discuss it with them. We believe the project has been well-received and that we have responsibly made information available to residents. The EIS process will allow additional information to be available to all residents of Kauai, as we begin the permitting process to allow development of the resort.

Public Plans and Policies. Chapter 3 of the DEIS will include a discussion of the project and its relationship to public plans and policies, including the State Tourism Plan, the County General Plan, the State Plan, and Coastal Zone Management objectives and policies.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



Ma Mau Ke Ea O Ke Aua I Ke Pua
Hawaii's own local Community Action Group
Protecting our Fragile Natural & Cultural Resources
through Research, Education, Advocacy & Litigation

**LIFE
OF
THE
LAND**

August 22, 1999

Scott Ezer
Helber Haster & Fee, Planners
713 Bishop Street, Suite 2190
Honolulu, HI 96813

Keiha Niha
Department of Planning
County of Kauai
444 Rice Street, Suite 473
Lihoe, Hawaii 96766

re Kapalewa'i Resort Environmental Impact Statement Preparation Notice

How many projects are there?

As Life of the Land read this Environmental Impact Statement Preparation Notice ("EISP") one thing really stood out. There are two proposed eco-camps on Agriculturally-Zoned Land: Kapalewa'i Resort (Kaua'i) and Puaena Eco-Camps (O'ahu). These two proposals have the same Applicant and the same Consultant! This was really shocking because we specifically asked if Puaena was one-of-a-kind or part of a larger vision. We were assured that it was one-of-a-kind. Currently the Applicant has released the Kapalewa'i Resort EISP, while the Puaena Resort plan has been sent to the County Council without a recommendation by the Department of Planning and Permitting.

Zoning

Zoning Laws are designed to bring about an orderly, well-defined change. Planning allows for adequate development of infrastructure (roads, utilities, schools, emergency services). The alternative is spot zoning where developers build whatever they want wherever they want. The extreme case are cities without zoning laws (Houston, Texas). As the Kauai 2020 Vision Plan (CAC Draft 3: 1/7/99) states:

"Land use regulations specifically provide for rural residential communities, with design standards to preserve open space and landscape features. Regulations and tax incentives are structured to promote legitimate agriculture enterprises and to increase opportunities for small farmers. ... We support our farm entrepreneurs in helping to keep Kauai green. Large- and small-scale agriculture and aquaculture operations occupy substantial tracts of prime agricultural land throughout the island. Forest plantations are situated on large and smaller tracts of land. County land use regulations and property tax incentives promote active agricultural and forestry use of agricultural lands."

• 76 North King Street • Suite 203 • Honolulu, Hawaii • 96817 • phone: 633-3464 • fax: 633-0993 •
• email: slh@hoboken.com •

Comprehensive planning and sound reasoning should be used to develop General Plans, Regional Plans and Development Plans. Comprehensive planning forces the municipality to focus on sound planning reasons when it makes its decision. As the Hawaii Supreme Court has noted: "Zoning ordinances are in derogation of the common law, and their provisions must be strictly construed."

Current Zoning

"The current [Kauai] General Plan designations for the project site are Open and Agriculture" (EISPN page 36). "The land use map of the *Waimea-Kula Regional Development Plan* was intended to establish a 10 to 15 year policy on moderate growth and development of the region. Land use designations for the project site were identified as Agriculture and Open Space." (EISPN page 38) "The Comprehensive Zoning Ordinance for the County of Kauai (CZO) define the allowable uses of land within Kauai County. ... the project site is a mix of "Open" and "Agriculture" zoning. Resort uses are not permitted in either the Open or Agriculture zoning districts." (EISPN page 39) "Approximately 80 percent of the property list within the SMA" (EISPN page 39)

"Agriculture is keeping Kauai green and economically healthy through a variety of crops and products from both large corporate and small farms. Aquaculture is also a strong and growing industry contributing to local markets and exports. ... The market for organically grown crops is increasing. ... Kauai now produces 50 percent of its own food, reducing food imports and keeping more money in the community. Small farmers on Kauai are thriving and profitable. ... Kauai's larger corporate agriculture and aquaculture businesses are volume exporters for niche markets. ... Their ability to weather varying market conditions lends stability to the Kauai economy. ... State and county government support diversified agriculture by offering tax incentives, maintaining the agricultural irrigation and road infrastructure on State-owned lands, and managing affordable agricultural parks." The *Kaui 2020 Vision Plan* (CAC Draft 3: 1/27/99)

"Need for its low-key development, dry and sunny climate, and laid-back lifestyle, the West Side offers surprising diversity. It includes small-town communities; vast agricultural lands; the unique resources of Waimea Canyon, Keoke and other meads wilderness areas; and the high-technology Pacific Missile Range Facility. ... Agricultural lands have been preserved from sprawling subdivisions." *Vision for the West Side Planning District* (Draft 199)

Resort Zoning

The Kapalawai project has far more restrictive zoning than the Puaena project. Both projects test the same principle. Can a developer propose a project which directly violates zoning laws that were just enacted or are in the process of being enacted. The Kapalawai project goes one step further: can the developer propose to look only at alternatives which violate the current zoning for the property? These are heavy issues. The EISPN MUST look at the CUMULATIVE IMPACT of proposing a series of eco-tourism developments that propose altering the way agricultural lands are used. Agricultural lands are protected by the State Constitution. This must be part of the analysis.

1. How are the projects in line with court rulings, Land Use Commission rulings, and Administrative rulings?

Similarities/Differences

Each facility (Puaena, Kapalawai) was originally designed to have eating facilities, fitness facilities, sports courts and swimming pools on site leading to the obvious question.

2. How much will the guests contribute to the local economy?

3. Do you have an economic model that shows this?

The Difference is that Kapalawai appears to have larger, more secure facilities. Kapalawai was designed to be slightly less dense in units. (250 units on 170 acres as opposed to 252 units on 144.5 acres [Puaena DEIS]). However, Puaena had a limit of 6 people/unit while Kapalawai has an unstated upper number/unit.

Alternatives

Before a developer can apply for a variance under Oahu's Land Use Ordinance (LUO), the developer must show that there is no REASONABLE use currently permitted.

4. Is Kauai's CZO the same?

5. Why were only four Resort alternatives looked at?

Life of the Land would like to see fully developed alternatives reviewed. These alternatives should include ALL less intensive uses for the land such as: (1) AG-2 Agricultural Use Subdivision; (2) Livestock Operations; (3) Diversified Agricultural Operations; (4) Agricultural Service Center; (5) Historical Site; and (6) Rural Residential.

Questions

6. What will be the increase in traffic expected on Kaunuaui Highway?

7. How will trespassers be changed (landmarks, cottages) as seen from the ocean?

8. Will the beach be more or less accessible to local residents?

9. How close will the nearest cottage be from the ocean?

10. How will the ocean be affected from normal operations?

11. How will the ocean be affected from non-point source pollution?

12. What interment urethans are on the property?

"Elements of a healthy economy: Preservation of our special environment and culture; Expanding and building local markets and reducing imports, resulting in more money remaining in the local economy; More jobs, with higher wages reflecting a variety of profitable businesses seeking qualified employees; A strong education system which prepares Kauai's children, teens, college students and adults to work in the diversified economy." The *Kaui 2020 Vision Plan* (CAC Draft 3: 1/27/99)

13. Will Kapalawai Resort preservation of our special environment? How?

14. Will Kapalawai Resort preservation of our culture? How?

15. Will Kapalawai Resort expand and build local markets? How?

16. Will Kapalawai Resort reduce imports? How?

17. Will Kapalawai Resort increase the amount of money remaining in the local economy? How?

18. Will Kapalawai Resort create local jobs for local residents that pay higher wages? How?

19. Will Kapalewai Resort help diversify the economy? How? Please be specific.
20. Will the county economy be more or less diversified if your project is approved? How?
21. Will Kapalewai Resort strengthen the educational system on Kauai? How?
22. How does a resort on agricultural land, which violates the General Plan, the Regional Plan, and the CZO, push the community-based values supporting the promotion of agriculture?
23. How does a resort on agricultural land, which violates the General Plan, the Regional Plan, and the CZO, help to diversify the economy?
24. Does a resort on agricultural land, which violates the General Plan, the Regional Plan, and the CZO, lead others to believe that zoning laws are only for the little guy while variances are for the elite? Or should variances be issued whenever someone wants something different than the existing law? If that is so, why have zoning laws in the first place?
25. Have there been any archeological reviews of the property? When? By whom?
26. Have there been any cultural (non-archeological) reviews of the property? When? By whom?
27. Please include the Office of Environmental Quality Control's Cultural Impact Guidelines in your Draft EIS. Please detail how the project conforms to each section of the guidelines.
28. Historically, have there been fishponds, shipponds, stranas, etc on the property?
29. Please explain the non-conformance of the project with each section of the General Plan, Regional Plan and CZO
30. Are there phases to the project?
31. Do you have a map of the full build-out?
32. Will non-potable water enter the ocean under any circumstances?

Please have copies of old maps, aerial photographs and military documents in the Draft EIS

APPENDIX
(underlined and bold added for emphasis)

A) Pe'a'ena/Kapalewai Comparisons

Project	<u>Pe'a'ena Eco-Camps</u>	<u>Kapalewai Resort</u>
Consultant	<u>Herber Hattori & Fee</u>	<u>Herber Hattori & Fee</u>
Consultant contact	<u>Scott Ezer</u>	<u>Scott Ezer</u>
Applicant	<u>Destination Resorts</u>	<u>Destination Resorts</u>
Applicant Contact	<u>Lewis Groyer</u>	<u>Lewis Groyer</u>
EIS	<u>(March 1996-May 1999)</u>	<u>(June 1999)</u>

Name of Project	Resort	Resort
Land Designation	Urban (Star) Agriculture (County)	Agriculture/Conservation (Star) Agriculture/Open Space (County)
Permits Required	SMA, CUP	SMA
Zone Changes	LUD	CZO, LUC
Variances Required		General Plan, Regional Development Plan
Alternatives	Agricultural Agricultural Agricultural Residential	Resort Resort Resort Resort

B) The Kaa'i 2020 Vision Plan (CAC Draft 3: 10/1991)

A. Strong, Diverse Economy

Kauai's economy is strong, stable and diversified. While the visitor industry still provides the largest number of jobs (40-55 percent of total jobs), new businesses in diversified agriculture, aquaculture and high technology provide an increasing proportion of total jobs.

Job opportunities are many and varied, with wages that allow people to comfortably support their families. Unemployment is at an all-time low of 3-5 percent. Kauai has a four-year college with agricultural, business, and high-technology programs to support our youth in finding well-paying, rewarding careers on Kauai.

Carrying on community traditions, some Kauaians provide a substantial portion of their own food and subsistence through hunting, fishing, gathering and subsistence. These activities support the traditions of aboriginal jobs of family and community working together, sharing the work and the bounty of land and ocean.

DIVERSIFIED AGRICULTURE AND AQUACULTURE

Agriculture is keeping Kauai's green and economically healthy through a variety of crops and products from both large corporate and small farms. Aquaculture is also a strong and growing industry contributing to local markets and exports.

Kauai is exporting coffee, seed crops, papaya and exotic fruits, and seafood, as well as refined sugar and other value-added food products. In addition, small farmers grow a variety of unique crops such as lava, hemp, herbs, nutmeg, turmeric, exotic flowers, and perfume ingredients. The taro industry is the largest in the state and a major supplier to O'ahu and to the mainland markets. Many taro products are produced on Kauai, including chips and poi. Other value-added food products are produced for both local consumption and export, including roasted coffee and refined sugar. Range-fed Kauai beef

Kauai residents support the farmers by buying locally-grown fruits, vegetables, taro and other basic foods. The market for organically-grown crops is increasing. In place of imported meat, Kauaians enjoy grass-fed beef from cattle raised in Kauai's beautiful pastures and prepared in local processing facilities. Kauai now produces 30 percent of its own food, reducing food imports and keeping more money in the community.

HIGH TECHNOLOGY

Kauai's high quality of life attracts knowledge-based businesses working in high technology enterprises. These businesses are linked with the college and the high schools, providing internship and training opportunities for Kauai students. After attending college, students are able to find well-paying high-technology jobs on Kauai. All parts of the island are served with fiber optic cable, allowing high-speed communications.

The entire island has access to fiber optic and the latest technological advances, accommodating large regional headquarters facilities as well as small businesses. These businesses, and the supporting programs provided in our schools and university, have encouraged our youth to stay on Kauai. Many residents have been trained in technological skills. A large number of them have their own businesses. Many work from their homes and service a world-wide market through global computer communications systems.

New high-technology businesses include a computer animation facility for the movie industry, and a solar energy research and development facility, and a bio-engineering company. Kauai has also become a center for electronic marketing, and several large national companies operate marketing centers here. Electronic marketing allows people to work from their homes, taking advantage of Kauai's excellent communications system. High-technology businesses employ two to three percent of our workforce.

The Pacific Missile Range Facility is a major federal research and development facility, supporting civilian as well as military projects. As one of the most important marine and space research centers in the Pacific, it attracts other high-technology businesses to locate on Kauai. Benefiting from a protracted period of peace among major world powers, PMRF is making a transition away from military applications into scientific and commercial research. With a proactive program to hire current and returning residents, PMRF provides training programs and works in cooperation with the college and the high schools. Continuing agriculture and aquaculture operations on adjacent State lands provides a buffer and uses surface water that would otherwise inundate the base.

State and county government support technology through funding research and development, providing solar tax credits and other tax incentives, making land and infrastructure available with appropriate zoning, and subsidizing the telecommunication infrastructure. They provide assistance in reaching global markets, in encouraging local employment and business ownership, in stimulating the development and use of alternative power generation, and in educating Kauai students so that they can fill high-technology jobs.

BUSINESS DIVERSITY

Small business is the foundation of Kauai's economy, employing the largest percentage of the population. There is a variety of opportunities: Small retail businesses, meeting resident and visitor needs; Outdoor recreation, including environmental tourism and sports facilities; Entertainment industry support facilities for movies and television; Kauai as a healing destination and health care provider for residents, both in the alternative health fields and in annexed living facilities for retirees; Innovative power generation; Light manufacturing and food processing; Authentic Hawaiian cultural businesses and cultural education; Home-based cottage businesses networked with shared marketing.

Some of the former sugar mills are now commercial centers with shops, museums, crafts and artisan areas, and restaurants. They are preserved for their historical significance and promote local products and culture.

State and county government have streamlined. They encourage small businesses by offering tax incentives and consulting assistance, especially during start-up. New businesses are nurtured to ensure their success. Financing is available. Regulations are simplified. Business education is subsidized.

Small farmers on Kauai are thriving and profitable. They are known for their high-quality products, including exotic fruits not available elsewhere. They are supported by a high local demand and exports to Asia and the Mainland. Many farmers work directly with restaurants and the visitor industry. Local agricultural products are an important attraction for visitors. The visitor industry stimulates Kauai's agricultural and aquacultural products, and stimulates marketing for export products.

Small farmers work together in co-ops, collaborating to control costs and effectively market their products. By developing strong local demand, they minimize their vulnerability to transportation problems and fluctuation in overseas markets.

Kauai's aquaculture businesses produce shrimp, frog legs, trout, and fish for local consumption and export to Asia and the mainland. Located mostly on the West Side, aquaculture farms employ 150-200 people and are still growing. State and county government support aquaculture with leases of government lands, low water rates, tax incentives, a supportive and proactive permitting process, improvement districts, and education and training. Prime aquacultural land is identified and preserved.

The college, as well as other organizations, help farmers to acquire business skills essential for success. There are specialized programs for tropical agriculture and aquaculture. Many of Kauai's youth are finding careers in these fields.

Kauai's larger corporate agriculture and aquaculture businesses are volume exporters for niche markets. Locally-managed, they work in cooperation with small independent producers. Their financial strength provides for new crop research and extensive marketing, resulting in increased demand for unique Kauai products. Their ability to weather varying market conditions leads stability to the Kauai economy.

The forest products industry is growing hardwoods in a number of locations throughout the island. Kauai's sawmill cuts the rough timber to provide local building materials, as well as to provide fine woods for local craftspeople making and exporting wood bowls, musical instruments, furniture and other wood products.

State and county government support diversified agriculture by offering tax incentives; maintaining the agricultural irrigation and road infrastructure on State-owned lands; and managing affordable agricultural parks. They promote cooperatives and partnerships for rental processing; provide facilities for disinfection and shipping; and offer technical and marketing support. Almost facilities have been improved to facilitate the direct shipment of Kauai agricultural products to the mainland. State and county government maintain rights to irrigation water and oversee shared usage and maintenance of irrigation systems. They also walk the talk by buying local products.

While 4-10 percent of residences continue to be built in agricultural areas, there is still an ample amount of prime agricultural land for existing use and future cultivation. Through a government-private landowner partnership, an inventory of small agricultural lots, with irrigation water, is maintained for lease to individual farmers and small cooperatives. This public-private partnership is supported through innovative tax incentives and zoning regulations.

Land, facilities and systems of the former sugar plantations are used primarily for farming, forestry, and aquaculture. Some mill buildings are now food processing centers. Sugar irrigation systems are maintained and enhanced. They are managed by joint government/private boards and supply Kauai's diversified agriculture industry island-wide. Enough water is available to return some to stream systems for tukuena, ahupua'a and recreational use.

THE IMPACT OF DIVERSIFICATION

Kauai's diverse economy has provided its residents with more challenging work at a variety of skill levels, better paying jobs, and greater economic stability. The cost of living has gone down and the standard of living has gone up for the average resident. People have more time with their families and to provide services to their communities.

Crime and drug use are down. In general, there is a greater sense of stability, peace of mind, and hope for the future. The diverse economy fosters the expansion and improvement of our education system, so that our youth can fill the available jobs.

Kauai's businesses and government work together to combine the key ingredients of a successful island economy. Government supports business by providing tax incentives and business assistance, and by minimizing regulation and controls.

Elements of a healthy economy: Preservation of our special environment and culture. Expanding and building local markets and reducing imports, resulting in more money remaining in the local economy. More jobs, with higher wages reflecting a variety of profitable businesses, seeking qualified employees. A strong education system which prepares Kauai's children, teens, college-grads and adults to work in the diversified economy.

A Vibrant, Stable Visitor Industry

Kauai has a vibrant, stable visitor industry, with high occupancy rates and a high rate of return visitors. Kauai is known not only as the Garden Island of a place of outstanding mountain and coastal scenery, but also as a community friendly to visitors. Kauai is known as a place where residents and businesses both respect and nurture the natural environment and their cultural heritage. Visitors can choose among a variety of activities: relaxed recreation and entertainment, in a more basic or luxury accommodations; viewing by motorized vehicle or by bicycle; adventures in ocean and wilderness exploration; and unique cultural experiences. Kauai is known for its extraordinary variety of activities.

While it is a major visitor destination, Kauai maintains a rural, laid-back atmosphere. Limited in height and size, visitor accommodations and attractions are located primarily in the major resort areas of Princeville, Waimea-Kapa, and Poipu. Visitor attractions and accommodations are designed to complement the rural setting. The island is safe, and commercial and public facilities are clean and well-maintained. People visit to enjoy the environment, culture, and authentic hospitality. They enjoy our parks, recreation areas, accommodations, restaurants, shopping and special events. Development is managed to feature the natural environment, using tropical Hawaiian architecture and natural materials. Traffic flow is controlled to minimize noise and crowding.

Kauai's residents, businesses, and government care for visitors and nurture the visitor industry. They share a common understanding that "The environment is the economy, our natural capital, the basis of our economic survival and success." Together, they plan for visitor industry development which is compatible with the environment, supports the community's quality of life, and sustains the qualities which attract visitors.

Kauai attracts over one million visitors per year. On average, there are 19,000 to 24,000 people visiting Kauai each day. Visitors occupy various types of accommodations, buy from local businesses, and bring outside money into the Kauai economy. The average length of stay per visitor is over six days, the highest among the Hawaiian Islands. Hotels and other resort accommodations have an average occupancy of 75 percent. Average wages and benefits for industry employees are the highest in the state.

Native Hawaiian organizations have assumed management and care of Hawaiian cultural sites, such as heiaus, and have developed cultural centers near important sites, where dance, language, and arts are practiced and taught. People trained in Hawaiian culture interpret the history and meaning of the sites as a paid service to visitors. The centers also market native crafts and other products.

Hotels and resort accommodations are located in designated Visitor Destination Areas (VDAs). The original VDAs of Poipu, Lihue/Hakohi, Waimea-Kapa, and Princeville continue to experience moderate growth.

In existing VDAs, older buildings have been renovated or replaced, consistent with architectural guidelines and environmental requirements. With the exception of a few larger hotels, resort accommodations built since the year 2000 are smaller, more low-key and intimate. New visitor accommodations on the West Side, designed with community input, consist of inn- and residential-style buildings.

New resort structures are required to maintain a deep setback from the coast, in order to avoid potential tsunami or hurricane damage, to preserve dunes and other important physical features, and to preserve views along the shoreline.

Vacation rentals, inns, and bed and breakfasts provide alternative visitor accommodations. They are licensed and monitored by professional associations, which promote cooperative relationships with neighbors.

AIRPORT & HARBORS

Lihue Airport supports the desired level of visitor industry development and the export of agricultural products to the mainland.

Several cruise lines visit Kauai and serve the travel industry and local residents with cruises of varying lengths and cost. Cruise ships are welcomed in Nawiliwili and Port Allen Harbors. Passenger reception areas are attractive and well-designed, with easy circulation among visitor welcome centers and ground transportation staging areas. Some communities also welcome cruise ships to moor off the coast and ferry visitors ashore, using small boat harbors.

Our small boat harbors accommodate boat tours and rentals, popular visitor recreation activities. Commercial use of the small boat harbors is managed by the State, assuring that facilities are adequate to accommodate resident fishermen and boating recreation. The Department of Land and Natural Resources manages and regulates boat tours and use of rental boats on the Waimea River, assuring that commercial boating does not degrade natural or recreational resources and does not crowd out resident use and enjoyment of the river. The DLNR regulates use of other rivers under the same principles. Limits on boat tour landings in wilderness coastal areas are strictly enforced.

Helicopter tours are another popular way that visitors experience Kauai. Tour companies work closely with residents to minimize negative impact and employ the latest technology to reduce noise. They limit flights to provide one quiet day each week in the various parts of the island. They control their routes to prevent intrusion on communities, sacred sites, and wilderness areas such as Kalanui Valley. Helicopter tour operations are centralized at Lihue Airport. To avoid imposing impacts on other communities, no additional heliport sites have been developed elsewhere on the island.

The visitor industry has contributed to a healthy economy by encouraging many new businesses and activities on Kauai. Our guests, as well as residents, can enjoy guided hiking, biking, horseback-riding, boat rides, and cultural tours. They can enjoy water sports and athletic parks, or attend classes on Hawaiian culture.

People visit Kauai to learn about Hawaiian culture. Ancient Hawaiian sites and cultural practices are preserved with respect and authenticity. They are protected, restored and interpreted appropriately. Some areas are off-limits and visited only under approved circumstances. Cultural sites and centers are managed by native Hawaiians and preserved by laws and regulations of the State and the County.

The people of Kauai appreciate the many benefits the visitor industry brings to the island. They, in turn, give the gift of aloha, encouraging guests to return and to stay longer. Residents support the industry's role in strengthening the economy, preserving the culture, and protecting the environment. In general, residents agree that a healthy, well-managed visitor industry is a major contributor to the quality of life on Kauai.

A Rural Landscape

Kauai is a place of great natural beauty and green open spaces, valued by residents and visitors alike. Rural and urban development are carefully planned and regulated to ensure that Kauai continues to be "The Garden Island".

About 55 percent of Kauai's lands, including waterbodies, mountains and wilderness areas, are preserved through the State Conservation District. About 40 percent of lands are devoted to agricultural and rural uses.

URBAN DEVELOPMENT

Business, residences, and other urban uses are concentrated in Kauai's towns. These compact communities occupy only four to five percent of the total land area. To minimize highway traffic and avoid urban sprawl, new residential communities are sited around existing major transit and job centers in Lihue and Koloa. In the past two decades, the largest number of new residences have been built in two new developments on either side of Lihue: Peaia-Pali on the west side of Lihue and an extension of Lihue town to the east and north, filling in around the airport and Hanalei. Another new residential/retail community has developed at Kalahele, near the Poipu resort area.

Expansion of urban areas, particularly new shopping centers and other retail developments, which attract a large amount of vehicular traffic, are controlled to avoid urban sprawl and strip development along the highway. Town edges are clearly defined and greenbelts are maintained between towns.

RURAL DEVELOPMENT

Rural areas are characterized by broad expanses of open space, a mixture of pastures and large-scale agricultural plantations, small farms, and clusters of residences. Land use regulations specifically provide for rural residential communities, with design standards to preserve open space and landscape features. Regulations and tax incentives are structured to promote legitimate agriculture enterprises and to increase opportunities for small farmers.

Rural residential development includes larger lots and clustered housing surrounded by open land dedicated to conservation or agriculture. Development standards require new residential development to match the character of the rural landscape. Roads and structures are integrated into the topography, compatible with the lay and look of the land. Large trees and important natural features, such as streams and hills, are preserved. Residences and other structures are sited and designed so that they do not visually dominate the landscape. Building height, size, color and materials are carefully controlled.

We support one farm enterprise in Lihue in Kauai, large- and small-scale agriculture, and some other agricultural uses. Substantial areas of prime agricultural land throughout the island. Forest plantations are sited on large and smaller tracts of land. County land use regulations and property tax incentives promote active agricultural and forestry use of agricultural lands. (See the DIVERSE ECONOMY section of the Vision Statement.)

RURAL ROADS AND HIGHWAYS

Our rural roads retain their "country character." They are limited to two lanes, bordered with natural vegetation. Speed limits are kept low for safety reasons. The right-of-way may include graded drainage swales, but there are no sidewalks, curbs or gutters. Only the vehicle travel lanes are paved, except where there is a paved bicycle route. One-lane bridges have been preserved, both for their historic value and because they slow traffic. Road signage is minimal. Safe bicycle and pedestrian routes are provided.

Highways in rural areas are designed to retain a natural appearance, affording unobstructed views of the ocean and the countryside. State and county agencies have adopted "flexible highway design" in order to enhance scenic and historic qualities and to strike a balance between flow of automobile traffic and safe facilities for buses, bicycles and pedestrians. Highway signage is minimized and is designed to enhance the travel experience. Electrical utility poles and lines are designed to be unobtrusive, and, where feasible, utility lines are placed underground. Trees and other plantings have been added along highways in places where they enhance scenic qualities. Scenic pull-outs, built with natural materials, are placed in key locations. Where four lanes are required to carry traffic in a particular corridor, the roadway is divided by a landscaped median or separated into two smaller roadways. Long stretches of highway between towns, such as the expanded section of Nāmouli Highway between Lihue and Mahia Road and the Kapaa Bypass, are designed as scenic parkways.

Keeping our roads and highways beautiful is a successful public-private effort. State and county agencies ensure proper roadside maintenance. Highways are bordered by low-care landscaping that does not require herbicide control. The County and community groups maintain an effective litter control program.

Most of what is seen along Kauai's rural highways is open land in active agricultural and natural uses, such as farming, ranching, wild areas and forest. To avoid the appearance of sprawl, County land use regulations require new residential development to observe wide setbacks from the highway. New commercial developments outside of existing towns are required to limit highway frontage, screen parking lots from the highway with landscaping, and provide access from a side road where feasible.

SHORELINE

Visitor industry development along the shoreline provides well-marked, easy-to-use public access and clean shorefront recreation facilities, with ample parking. Buildings are set well back from the shoreline, providing an open, landscaped area with a street or walkway facilitating public access up and down the beach. Residents and visitors share the beaches comfortably.

Development along the shoreline is designed and landscaped to moderate visual impact. There is a transition zone which allows increased building height with larger setbacks, up to the four-story height limit.

Residential and other buildings are generally excluded from undeveloped shoreline lands which are in the State Conservation District or which are designated "Open" under the Kauai General Plan. In newly zoned areas, residential and resort development has been required to set back beyond the historic hurricane inundation zone and beyond areas at hazard of chronic beach erosion. We have also landscaped oceanfront whenever possible, to protect views, and open space. Residences along the shoreline are required to meet special design standards for height, size, setback, and color.

Increased setbacks have reduced the need for seawalls or artificial hardening of the shoreline. Along sandy shorelines, shore protection structures are allowed only in special instances as a last resort.

C) Vision for the West Side Planning District (Draft 1993)

Kauai's West Side covers the area from Eleele to Kekaha. Noted for its low-key development, dry and sunny climate, and laid-back lifestyle, the West Side offers surprising diversity. It includes small-town communities, vast agricultural lands, the unique resources of Waimea Canyon, Kokee and other mauna wilderness areas, and the high-technology Pacific Missile Range Facility.

The West Side maintains an active sugar plantation, preserving the vast green sugar fields and the working sugar mill at Olokele. The "historic sugar corridor" is a major visitor attraction, linking the plantation and mill with the towns and other historic sites. Visitors come to the West Side to see the sugar corridor attractions, shop in the towns, gain access to the Waimea Canyon and Kokee parks and trails, and to enjoy ocean activities out of the small boat harbors. During the last 20 years, businesses and employment have increased due to the sugar corridor, the addition of small lots and residential-style visitor accommodations, expansion of aquaculture and diverse agriculture, and increased use of the harbors by cruise ships and visitor excursions.

The West Side prides itself on its small towns and lack of urban sprawl. Agricultural lands have been preserved from sprawling subdivisions. Retail shops and commercial businesses are contained within the towns. New resort developments occur in village clusters hidden from the highway. Kumuiahi Highway between Hanalei and the Puuinau Forest affords its visitors broad views of sugar fields and natural features, looking both mauna and makai.

Eleele and Hanalei are the gateway to the West Side. As Kumuiahi Highway turns south and descends from the uplands of Kahaione, views of the ocean open up together with views of mountains, valleys and the Hanalei River valley. Over the years, residential developments in Eleele and on Hanalei Heights have brought more families to the area. Eleele's businesses serve local residents, while visitors are especially attracted to Old Hanalei Town. The historic character of the town is cultivated through careful renovation of historic buildings and appropriate design of new buildings. Hanalei is a center for artists and craftspeople, offering numerous shops, galleries, and restaurants.

Puuinau is a center for industrial and port activities. Expanded and improved commercial harbor facilities accommodate the new generation of large cruise ships and their large passenger loads. Around the small boat harbor, new harbor facilities and adjacent commercial developments attract cruise passengers and other visitors to patronize commercial fishing charters, boat tours and other recreational activities, while still providing ample access to commercial fishermen and recreational boaters.

Waimea is the vital civic center of the West Side, home to the high school and other community facilities as well as to a variety of restaurants and retail stores. As the gateway to Waimea Canyon and Kokee State Parks, the town serves a large number of visitors from visitors as well as from residents. Waimea also attracts visitors because of its many historic sites. The community continually seeks to enhance its historic sites, to improve walking connections among the sites and businesses, and to reinforce the historic character of the town. Historic buildings are well-maintained, and new buildings are designed to be consistent with the historic architecture. Well-located parking and good walkways help to minimize traffic congestion. A new visitor center occupies a central location and serves as the starting point for walking tours of historic sites. The expanded High-Tech Center attracts a wide range of both mainland- and locally-based companies. An expanded and improved Kilauea Harbor, with adjacent commercial facilities, supports ocean recreation and fishing for both residents and visitors. Increased small-scale visitor accommodations in and around Waimea bring jobs and prosperity, while contributing to the historic and open space character of the region.

NATURAL RESOURCES

Kauai's most abundant natural resources are its lands and waters, clean rivers, blue skies and open fields. Our protected natural resources in non-agricultural open space are vital to the environment, which is the foundation of our economy. These resources provide recreation for residents, aesthetic value and land enjoyment, affect agricultural lands, and support self-sufficiency. Kauai County works closely with State and Federal agencies to conserve our natural resources for future generations.

PARKS

The County Parks Program supports driving youth and adult sports leagues, as well as providing a diverse range of recreational and social opportunities for people of various ages and interests. The Parks program also recognizes the need to support the visitor industry and to balance visitor and community needs. An alliance between the County Parks Division and the visitor industry ensures that park facilities used by visitors are well-maintained, supported by visitor fee revenues and industry revenues.

The updated County Parks Master Plan is used to prioritize capital improvements and development of new parks and indoor recreation facilities. The Master Plan is fiscally-conscious, balancing projected capital expenditures and long-term operating costs against projected available financial resources. The Master Plan's priorities are adjustable, based on a combination of community benefits and consideration of the degree to which costs are offset by user fee revenues and/or community work.

Visitors share Kauai's parks, natural areas, and waters in harmony with residents and the environment. The County is implementing a park master plan which is regularly updated and sets priorities for park operations and capital improvements. Each of the major State parks also has an up-to-date master plan, prepared in collaboration with the community. Increased funding to maintain and expand parks comes from State tax revenues as well as user fees paid by out-of-state visitors. Parks are safe, welcoming and clean. Parking is ample. Facilities are available for local gatherings and public events.

ACCESS

We manage the access to public lands and shoreline by enforcing laws, writing our solutions with all concerned, and establishing dedication and acquisition programs funded by developers. Landowners are offered incentives such as easement, tax credits for access, and limits on liability for public access. Conveyance taxes are used to acquire public lands, parks, and shoreline areas. We plan ahead for access by purchasing areas deemed necessary, using clear guidelines established through community-based planning.

Towns and Commercial Development

The County has completed major actions to revitalize and improve central Hanalei and Kauai's historic small towns and communities. Actions include upgraded sewer and water facilities, public parking, sidewalks and other pedestrian-friendly improvements. These were coordinated with County zoning, private landowner initiatives, and highway and road development through collaborative planning among County agencies, community and business organizations, and the State Highways Division.

Under the General Plan, new commercial development has been focused on meeting community shopping needs while supporting local small businesses and older business areas. With strategic decisions about highway development and new commercial zoning, the County has brooked trip development and urban sprawl.

framed by the ocean and by large open spaces being cultivated in various agriculture and aquaculture crops. Kihaha retains its simple, small-town charm. Diversified agriculture companies and small farmers now cultivate the beach once used by the Kihaha Sugar Company. The town looks out on a well-maintained beach park, which has perling, comfort stations, and "oases" of plantings and picnic facilities. The beach is enjoyed by residents and visitors from all over the island. Small-scale accommodations provide hospitality for a limited number of visitors. Good pedestrian walkways connect the beachfront with town squares located a few blocks inland. The renovated sugar mill houses shops, a museum about West Side culture and history, and an area devoted to the making and sale of hand-craft items. A small industrial area, set apart from residences, provides opportunities for manufacturers and other industrial businesses. The parks and streets are landscaped with trees and other vegetation that is suited to the sunny, dry climate and can be maintained with minimal irrigation.

Issues for West Side Communities

1. Kihaha Landfill. Kawi needs to expand the Kihaha Landfill or develop a replacement landfill facility within the next 5-10 years. Selecting the appropriate option is an islandwide issue, involving trade-offs on environmental impacts, costs of operation and other factors.
2. Use of Burns Field. The State has proposed construction of a heliport at Burns Field. Community groups such as the Managers' Improvement Association are opposed to increased helicopter operations and recommend instead that the airfield be converted to park use. This would allow for expansion of the well-used Salt Pond Park.
3. Commercial Boating. These businesses are growing and will provide job opportunities on the West Side. There is concern, however, that fisherman and recreational boaters may be squeezed out. State small boat harbor facilities need to be expanded and improved.

Opportunities

1. Access to mountains and beaches. Between Wahiawa and Waimea, access to the mountains and beaches is controlled by private landowners. Allowing limited access to some beaches and some hiking trails could provide new recreation opportunities for residents and economic opportunities for landowners.
2. Kihaha Bypass Road. A main bypass road could relieve traffic on the beachfront highway, providing a better route for heavy trucks traveling to and from the landfill as well as for other through traffic to PMPJF and agricultural operations. If the County decides to expand the landfill, building a bypass road is one way to mitigate impacts and support improvement of the beachfront roadway.
3. Kokee State Park. The State Department of Land & Natural Resources is preparing a new Master Plan for Kokee. Its attentiveness to "ecotourists" and the many recreational activities at Kokee could support increased visitors and new business opportunities on the West Side.

D) Kauai County Code

(This Kauai County Code is made available [on the Web] by the Kauai Board of Realtors. The County of Kauai neither warrants, guarantees, nor assures the accuracy or completeness of this version of the Kauai County Code, or that this version of the Code is up-to-date.)

Article 1. General Provisions

Sec. 8-1.1 Title. This Chapter shall be known as and may be cited as "The Comprehensive Zoning Ordinance for the County of Kauai" and its official abbreviated designation shall be "CZO".

Sec. 8-1.2 Purpose. This Chapter is adopted for the purpose of: (a) Implementing the intent and purpose of the adopted General Plan. (b) Regulating the use of buildings, structures and land for different purposes. (c) Regulating location, height, bulk and size of buildings and structures, the size of yards, courts and other open spaces. (d) To maintain the concept of Kauai as "The Garden Isle", thus assuring that any growth will be consistent with the unique landscape and environmental character of the island. (e) To insure that all physical growth is carried out so as to maintain the natural ecology of the island to the extent feasible. (f) To create opportunities for a greater fulfillment of life through the development of a broad spectrum of educational and cultural pursuits. (g) To promote and protect the health, safety and welfare of all residents. (h) To provide opportunities for desirable living quarters for all residents in all income levels. (i) To recognize those aspects of the island and its people which are historically significant, and to preserve and promote them as a continuing expression of the island's physical and social structure. (j) To guide and control development to take full advantage of the island's form, beauty and climate, and preserve the opportunity for an improved quality of life. (k) To protect, maintain and improve the agriculture potential of land located in the County.

Sec. 8-1.3 Nature Of County Zoning Ordinance. (a) This Zoning Ordinance consists of the establishment of six (6) major Use Districts in conjunction with two (2) Special Districts within the territory of the County of Kauai. (This Chapter includes regulations concerning the uses permissible within each of the six (6) Use Districts and concerning the special conditions under which the uses may be developed or created within each of the two (2) special districts.) The boundaries of the Use Districts are established on the Zoning Maps of the County as specified in Sec. 8-2.3 of this Chapter. The boundaries of the special districts are established on the Zoning Maps or on the Constituent Map.

(b) The districts established and located by this Chapter are based upon the findings and analysis utilized in the General Plan for the County of Kauai. The designations of the Use Districts reflect in part the elements of the environment and society and, in addition, reflect appropriate interrelationships of land use, transportation, utilities, public services, existing development, recreational and employment opportunities, economic conditions, resource management, and population.

(c) The designations of the Constituent and Special Treatment districts reflect: (1) The capability of the land within the County to accommodate disturbances; (2) Potential threats to health, safety and welfare, social and aesthetic natural resources.

(d) The intent of the regulations governing all districts is to be permissive within the minimum requirements and performance criteria specified for each district. Development, use or construction should be permitted where it can be established by following the provisions of this Chapter so that the development and construction for a specific use or combination of uses can be accommodated within the specific physical and social conditions of a particular location in such a manner that it will not create the inadequate, harmful or disruptive conditions that formed the basis of the establishment of regulations of any district.

(e) The Use Districts allocate and regulate the various functions necessary to a diverse and viable society and specify the performance required to develop land and create improvements consistent with those functions and their interrelationships.

(f) The Residential District regulates the number of people living in a given area by specifying the maximum allowable number of dwelling units that may be developed on any given parcel of land. In order not to differentiate between economic groups or life-styles, a reasonable flexibility in the type of dwelling units and their placement on the land has been provided.

(g) Commercial, Industrial and Resort Districts recognize the specific nature of such uses and allocate their location in relation to land suitability and established or potential patterns of residential uses and other activities, such as transportation and community facilities.

(h) The Agriculture District establishes means by which land needs for existing and potential agriculture can be both protected and accommodated, while providing the opportunity for a wider range of the population to become involved in agriculture by allowing the creation of a reasonable supply of various sized parcels.

(i) The Open District is established and regulated to create and maintain an adequate and functional amount of predominantly open land to provide for the recreational and aesthetic needs of the community or to provide for the effective functioning of land, air, water, plant and animal systems or communities.

(j) Overlaying the regulation of development or use in any or all of the Use Districts are additional special regulations which relate more specifically to the land and the existing community structure. These special regulations have been defined in the Coastal District and the Special Treatment District and may modify the manner in which uses regulated under the Use Districts may be developed or may require special performance in the development.

(k) The Coastal District specifies the additional performance required when critical or valuable physical, ecologic, or biologic characteristics of the environment exist on the same parcel where particular functions or uses may be developed.

(l) The Special Treatment District specifies the additional performance required when critical or valuable social or aesthetic characteristics of the environment or community exist in the same area as a parcel where particular functions or uses may be developed.

(m) Any or all of these districts may envelop any Use Districts, creating accumulated regulations which more nearly relate to the conditions of the specific location where the development or use may occur.

(n) Since the degree and type of the development or use may determine the magnitude of public concern, the procedures for administering the requirements of use and condition have been structured to permit smaller developments, while insuring that the effects of larger developments are adequately examined. (Ord. No. 164, August 17, 1972; Sec. 8-13, R.C.O. 1976)

Sec. 8-1.4 Application Of Regulations. (1) For the purposes of this Chapter, the County of Kauai shall include the districts of Waimea, Koloa, Lihue, Hanalei and Hanalei as described in Section 4-1(4), H.R.S. (2) Unless otherwise expressly prohibited by law, the provisions of this Chapter shall apply to all areas within the County boundaries.

Sec. 8-1.5 Definitions.

When used in this Chapter the following words or phrases shall have the meaning given in this Section unless it shall be apparent from the context that a different meaning is intended:

"Agriculture" means the breeding, planting, nourishing, curing for, gathering and processing of any animal or plant organism for the purpose of nourishing people or any other plant or animal organism; or for the purpose of providing the raw materials for non-food products. For the purposes of this Chapter, Agriculture shall include the growing of flowers and other ornamental crops and the commercial breeding and raising for animals as pets.

"Aquaculture" means the growing and harvesting of plant or animal organisms in a natural or artificial aquatic situation which requires a body of water such as a pond, river, lake, estuary or ocean.

"Compatible Use" means a use that, because of its manner of operation and characteristics, is or would be in harmony with uses on adjoining properties in the same zoning district. In judging compatibility the following shall be considered: intensity of occupancy as measured by dwelling units per acre; pedestrian or vehicular traffic generated; volume of goods handled; and other factors such as, but not limited to: vibration noise level, smoke, odor or dust produced or light or radiation emitted.

"Taxi Cab Campgrounds" means land or premises designed to be used, let or rented for temporary occupancy by campers traveling by automobile or otherwise and which contain such facilities as tent sites, bathrooms or other sanitary facilities, piped water installations, and parking areas, but not including mobile home parks. Developed campgrounds may include facilities for the temporary placement of camp trailers and camping vehicles which are utilized for non-permanent residential uses at no more than six (6) vehicles per acre.

"Diversified Agriculture" means the growing and harvesting of plant crops for human consumption which does not involve a long-range commitment to one (1) crop. Diversified Agriculture includes truck gardening and the production of fresh vegetables, and minor fruit or root crops such as guava or taro.

"Open Space" means the portion or portions of a parcel unoccupied or unobstructed by buildings, paving or structures from the ground upward.

"Organized Recreation Camps" means land or premises containing structures designed to be used for organized camping. The structures include bunk houses, tent platforms, mess halls and cooking facilities, and playfields. Examples include Boy Scout Camps and summer camps.

"Outdoor Amusement, Commercial" means land or premises designed to be used by members of the public, for a fee, that contain outdoor amusement facilities such as miniature golf courses, merry-go-rounds, car race tracks, and outdoor motion picture theaters.

"Outdoor Recreation" means uses and facilities pertaining primarily to recreation activities that are carried on primarily outside of structures.

"Outdoor Recreation Concessions" means uses and facilities ancillary to outdoor recreation uses, such as gasoline pumps at piers and marinas, and boat rental and food and beverage facilities at public beaches.

"Private Recreation Areas" means lands or premises designed to be used exclusively by owners and renters of dwelling units, that contain such facilities as tennis courts, playfields, swimming pools, clubhouses, tennis beaches, and piers.

"Transient Vacation Rentals" means rentals in a multi-unit building for visitors over the course of one (1) or more years, with the duration of occupancy less than thirty (30) days for the transient occupant.

"Underground Campground" means land or premises designed to be used for temporary occupancy by campers arriving by foot or horse which may contain facilities and fireplaces, but do not contain facilities as are provided at developed campgrounds.

E) Pua'eoa Eco-Camp

Project Name: Pua'eoa Eco-Camp. **Location:** Haleiwa, Hawaii, U.S.A. **Client:** Destination Villages, LLC. The Pua'eoa Eco-Camp represents a project that underscores the operating philosophy of its developer, world-renowned Stanley Sclinger: to provide intimacy with the outdoors in a beautiful setting with facilities that allow some comfort and convenience. In addition, the construction and operation of these facilities must be conducted in an environmentally sensitive manner, including the recycling of waste and trash. The focus is to demonstrate that enhance a vacation experience. Heiber Hutzler & Fre, Planners' task was to design a master plan for the project while remaining faithful to its operating philosophy. The result is a 144.5-acre site that includes 232 cottages, an on-site nursery to provide native plants to regenerate the site, a multi-purpose building, open-air pavilion, recreational facilities, catering, the preservation of a 14-acre wetland, interpretation of on-site historic sites, and an on-site wastewater treatment plant that will provide irrigation water for the project. HH&F also managed the production of and was the principal author for the project's environmental impact statement." www.ahh.com/projects/puaeoa.htm


F) Waimea Plantation Cottages

"Visitor Accommodations. Waimea Plantation Cottages has served, since 1983, as the only "resort" at West Kona. The 48 unit complex is made up of rehabilitated plantation housing from Waimea, Kikaha and Maau. The community events and festivals have outgrown this small resort and there is a need another low-key development or expansion of the cottages. Waimea, especially during the winter months, has become a popular getaway for visitors from off-island as well as from the rainy North and East Shores. Families with roots in the plantations of West Kona's hold family reunions, some annually, in these nostalgic historic homes. Gay & Robinson, Inc. is looking at a similar style of development at the Kapehuwai Homestead near the Kaula Point. They have leased the land to Louis P. Geyer of Destination Villages. Possible plans include a messroom, 125 cottage units and low-key resort amenities. Along with these resort facilities there are vacation rental, bed & breakfast and camping facilities available to accommodate visitors." waimea.hawaii.gov/waimea/visitors/waimeaprofile.html

G) Robison Family Partners

"Robison Family Partners. Chairman: Warren Robison. Size of Kona's Land Holdings: 51,000 acres. Primary Land Uses: Agriculture, cattle. Organization: Private Corporation with Board of Directors. Headquarters: GAR Sugar, Makawili, HI 96769. History: Because the family member, Francis Sinclair, was not content with the climate and living conditions on Ni'ihau, she purchased the ahupua'a (large land division) of Makawili on Kona's which belonged to Victoria Kamahele, a granddaughter of Kamehameha I.

The family land holdings increased further with additional land purchases in Hualapepe, Kaibua, Waipua, and small suberfluous lots in scattered locations. The latter purchases occurred between the late 1800s and the 1960s." www.hawaiilife.com/databook/kona/land.html

Sincerely,

Henry Curtis
Executive Director

Heiber Haxert
Planners

November 5, 1999

Mr. Henry Curtis
Executive Director
Life of the Land
76 North King Street, Suite 203
Honolulu, HI 96813

Dear Mr. Curtis:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 22, 1999 on the above environmental impact statement preparation notice (EISP). Your letter will be included in the draft environmental impact statement being prepared. For your ease of reference, we will respond to your comments in the order they appear in your letter. However, before proceeding with these responses, we would like to make clear that the proposed development at Kapalawai is a resort. Land use approvals for the resort will include a State Land Use District Boundary Amendment, a County of Kauai General Plan Amendment and Zoning Amendment, in addition to a Special Management Area Use Permit. No variances are being sought for this project. Further, we respectfully submit that any comments or questions you have concerning the proposed development on Oahu are inappropriate and irrelevant to the consideration of the EISP and the DEIS for this project, and should be addressed to appropriate agencies with jurisdiction on Oahu.

1. How is the project in line with court rulings, Land Use Commission rulings, and Administrative rulings?

As discussed in the EISP, and elaborated upon in the DEIS, the proposed project must obtain a number of County and State land use approvals. These approval processes have long-established legal procedures that will be followed, as many other similar projects have followed in the past.

Heiber Haxert & Fre
Creator Center, Mahai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
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Heiber Haxert
Planners

Mr. Henry Curtis
November 5, 1999
Page 2

2/3. How much will the guests contribute to the local economy?/Do you have an economic model that show this?

An economic and fiscal impact analysis has been prepared for this project and will be appended to the DEIS. This report indicates (using accepted economic models referenced in the report) that in total, direct visitor expenditures are estimated to represent \$17.8 million in 2002, increasing to about \$21.2 million by 2004. Including the indirect and induced multiplier effects within the state, visitors attracted by Kapalawai could account for over \$36 million in new annual visitor expenditures by the time of project stabilization.

4. Does the Kauai CZO require that one must show there is no reasonable use of the property currently permitted before a variance can be submitted?

No zoning variances are contemplated for the Kapalawai Resort.

5. Why were only four Resort alternatives looked at?

Four alternatives will be discussed in the DEIS: (1) high density resort; (2) golf course; (3) mixed use Resort/commercial/residential; and (4) Residential. The consideration of various alternatives was based on several factors, including the preservation of existing historic resources and the necessity to provide the Robinson family with necessary income to supplement agricultural operations. The chosen alternative meets these objectives with the least environmental impact, while fitting in with the scale of development on West Kauai.

6. What will be the increase in traffic expected on Kaunualii Highway?

A traffic impact assessment was prepared for the project and will be summarized in the DEIS, and appended in its entirety.

7. How will viewplanes be changed (landmarks: cottages) as seen from the ocean?

The cottages will be setback from the shoreline at least 100 feet. The property is blessed with a large number of mature trees, many located at

the shoreline. The cottages will be situated within the trees and landscaping and will be visually screened from the ocean.

8. Will the beach be more or less accessible to local residents?

The shoreline will be more accessible to local residents.

9. How close will the nearest cottage be from the ocean?

See #7, above.

10. How will the ocean be affected from normal operations?

Impacts to the ocean will be minimal. Over the past few decades, the Robinson family has not been able to maintain the property as had been the practice during the past. With development, planting of appropriate landscape elements, and irrigation, the entire property will be less susceptible to wind and stormwater runoff. Runoff that is generated will be detained on-site until sediments have settled. Overall, the effects of sedimentation will actually be reduced.

11. How will the ocean be affected from non-point-source-pollution?

A marine resources survey was prepared for this project, and its findings determine that the ocean fronting the property is affected by sediments delivered from mauka lands. This is clear from the observation of specific coral species which are abundant in the nearshore region fronting the property, and the normal range of environmental conditions where these corals are found. As indicated in #10, above, sedimentation from the property itself will be negligible. The marine resources survey will be appended to the DEIS.

12. What intermittent streams are on the property?

Two streams are found on the property: (1) the Mahaikona Stream in the center of the property; and (2) the Aakuku Stream on the eastern end of the property.

- 13/14 Will Kapalawai Resort preserve our special environment/culture?

The development objectives of the project are deeply rooted in a commitment to preserve an important part of Kauai's (and Hawaii's) history. The primary focus of this preservation effort are the physical reminders of the Robinson's family use of the property as a primary residence for over one century. These include the main residence and its accessory buildings. These structures will be renovated, restored, and incorporated into the design of the project. The residence will have a significant portion of its floor area devoted to a museum. Another important resource on the property is a degraded inland fishpond that will be improved as a result of the project. Further, the project is scaled to complement the region's existing development patterns.

In terms of historic resources, in addition to the main house complex and the fishpond, three other historic sites will be preserved as-is and integrated into the site plan.

- 15/16 Will Kapalawai Resort expand and build local markets?/Create local jobs for local residents that pay higher wages?

In addition to the 200 full time jobs estimated to be created by the resort, a total of 120 induced or indirect, full time jobs are expected. These jobs will be created in service industries that serve the resort directly, or through companies that do business with the companies that do business with resort directly. A large number of these opportunities will be created in West Kauai.

- 16 Will Kapalawai Resort reduce imports?

It is unclear from your question what kind of imports you are referring to. The resort can help diversified agricultural on Kauai by purchasing produce and other foodstuffs available on Kauai from Kauai producers. In this context, they will be increasing demand for local products.

- 17/19 Will Kapalawai Resort increase the amount of money remaining in the local economy?/Will Kapalawai help diversify the economy?

We believe this question relates to concerns about "leakage" of dollars spent on Kauai out of Kauai. Kapalawai Resort will not directly provide

many of the services and activities associated with similar projects. Instead, local entrepreneurs will be asked to provide these services. In this manner, dollars spent by guests will go directly into the pockets of local residents. A policy of buying local produce and other food products available will also ensure that leakage is kept to a minimum.

20. Will the county economy be more or less diversified if the project is approved?

The development of the Kapalawai Resort will add a unique hospitality product to the Kauai market. The low-density (250 units on 170 acres), residential-scale (cottages), and historic nature of the property will provide an ambience that is not found anywhere else, and will broaden the appeal of Kauai to a more diverse travel group.

21 Will the Kapalawai Resort strengthen the educational system on Kauai?

The development of the Kapalawai Resort will strengthen the educational system on Kauai. In particular, the culinary program at Kauai Community College is recognized for its excellence. The two restaurants at Kapalawai will provide opportunities for graduates of this program. In addition, the resort will offer additional travel industry management positions to residents of Kauai.

22. How does a resort on agricultural land, which violates the General Plan, the Regional Plan, and the CZO, push the community-based values supporting the promotion of agriculture?

Earlier, we pointed out that the project must obtain several County and State land use approvals. If obtained, the project would then be in conformance with land use policies. In addition, we also pointed out that the project site has never been used for commercial agricultural production. In fact, the property is not attractive for agricultural classification systems. It is rated poorly by the ALISH and Land Study Bureau

23. How does a resort on agricultural land, which violates the General Plan, the Regional Plan, and the CZO, help to diversify the economy?

See #19, above.

24. Does a resort on agricultural land, which violates the General Plan, the Regional Plan, and the CZO, lead others to believe that zoning laws are only for the little guy while variances are for the elite? Or should variances be issues whenever someone wants something different from the existing law? If that is so, why have zoning laws in the first place?

No variances are being requested for the Kapalawai Resort. All applicable procedures and regulations for land use approvals will be followed.

25/26 Have there been any archaeological/cultural review of the property? When? By whom?

An archaeological inventory survey and traditional customs and practices report were prepared for the DEIS by Cultural Surveys Hawaii in 1999. Both reports will be appended to the DEIS.

27. Please include the Office of Environmental Quality Control's Cultural Impact Guidelines in the DEIS. Please detail how the project conforms to each section of the guidelines.

The Office of Environmental Quality Control (OEQC) prepared a pamphlet in 1997 entitled *Guidelines for Assessing Cultural Impacts*. In OEQC's own words "The Environmental Council encourages [emphasis added] preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance [emphasis added] for any assessment of a project that may significantly affect cultural resources."

In following the intent of this guidance, we enlisted the services of Cultural Surveys Hawaii (CSH) to prepare two reports for this DEIS: (1)

Helber Haster
Planners

Mr. Henry Curtis
November 5, 1999
Page 7

an archaeological inventory survey; and (2) a traditional customs and practices assessment. Both of these reports are appended in their entirety to the DEIS. CSH is familiar with *Guidelines for Assessing Cultural Impacts*, and has prepared numerous studies that have been accepted by the Department of Land and Natural Resources, State Historic Preservation Division. The traditional customs and practices report prepared for this project is consistent with the guidelines, and in compliance with the intent of Chapter 343, Hawaii Revised Statutes, and Title 11, Chapter 200, Hawaii Administrative Rules.

28. Historically, have there been fishponds, saltponds, streams, etc., on the property?

The DEIS will document the two streams identified above (#12), in addition to the existing fishpond.

29. Please explain the non-conformance of the project with each section of the General Plan, Regional Plan and CZO.

Chapter 3 of the DEIS will contain a discussion of the project in relation to these public plans and policies.

30. Are there phases to the project?

The project will be constructed in one phase.

31. Do you have a map of the full build-out?

Figure 4 in the DEIS will portray the development plan for the project.

32. Will non-potable water enter the ocean under any circumstances?

It is probable that during periods associated with intense storm events, that stormwater from the property will enter the ocean.

33. Please have copies of old maps, aerial photographs and military documents in the DEIS.

The DEIS will include aerial photos from 1953 and 1992, in addition to photographs of the property between 1897 and 1930. We do not

Helber Haster
Planners


Mr. Henry Curtis
November 5, 1999
Page 8

understand your reference to military documents as the property has never been under the jurisdiction of the Department of Defense, or any other federal agency.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



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

August 19, 1999

99-166/epo

BRUCE S. JACKSON, P.L.D., M.P.H.
DIRECTOR OF HEALTH

BY FAX, PLEASE REFER TO:

Mr. Kenneth Nitta
August 19, 1999
Page 2

99-166/epo

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems," and to the "Guidelines for the Treatment and Use of Reclaimed Water," November 1993. The Department will need to review and approve the wastewater plans before construction begins.

Should you have any questions on this matter, please contact the Planning/Design Section of the Wastewater Branch at 586-4294.

Safe Drinking Water

1. Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules, Title 11, Chapter 20, Rules Relating to Potable Water Systems.
2. Chapter 11-20, Section 11-20-30 requires that new or substantially modified distribution systems for public water systems be approved by the Director of Health. However, if the water system is under the jurisdiction of the County of Kauai, the Department of Water will be responsible for the review and approval of the plans.
3. Chapter 11-20, Section 11-20-29 requires that all new sources of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set forth in Section 11-20-29.
4. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses, performed by a

Mr. Kenneth Nitta
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

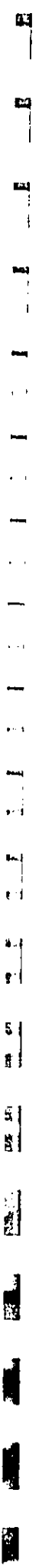
Dear Mr. Nitta:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kapalawai Resort
Waimea, Kauai
TMK: 1-7-5: 1

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer.

Wastewater

As there is no existing sewer service system in the area and none will be constructed in the near future, the Department of Health concurs with the proposed construction of a private wastewater treatment facility. We also concur with and encourage plans for the use of treated effluent for irrigation. We do recommend that wastewater be treated to R-1 standards, as there are less restrictions on the types of reuse and setback distances which must be met with lower quality reclaimed water.



laboratory certified in the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional tests may be required by the Director of Health upon his review of the information submitted.

5. The Safe Drinking Water Act Amendments of 1996 introduced a number of new mandates and initiatives that emphasize the prevention of contamination through improved water system management. Two such programs will impact the proposed water system:

- a. **Capacity Assurance:** By October 1, 1999, all new public water systems must demonstrate adequate technical, financial, and managerial capacity necessary to reliably produce and deliver drinking water meeting all State and Federal drinking water regulations prior to commencing operations.

Technical capacity refers to the management structure of the water system, including but not limited to the adequacy of the source water, infrastructure (source, treatment, storage, and distribution), and the ability of system personnel to adequately operate and maintain the system and to otherwise implement technical knowledge.

Financial capacity refers to the financial resources of the water system, including but not limited to revenue sufficiency, credit worthiness, and fiscal controls.

Managerial capacity refers to the management structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages to customers and regulatory agencies.

- b. **Operator Certification:** EPA has established guidelines specifying minimum standards for certification and recertification of the

operators of community water systems and nontransient, noncommunity water systems. Every water system must have an operator to perform certain key compliance functions, and who is trained and certified to the level that the State determines is appropriate to the functions, facilities, and operations of that system.

6. The Environmental Impact Statement Preparation Notice indicates that the proposed development will have a dual water system. The potable and nonpotable water systems must be carefully designed and operated to prevent cross-connections and backflow conditions. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow preventers to avoid contaminating the potable water supply. All nonpotable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption of nonpotable water.

If you have any questions concerning these comments, please contact Mr. Stuart Yamada of the Safe Drinking Water Branch at 586-4258.

Sincerely,


GARY GILL
Deputy Director for
Environmental Health

c: OEQC
Destination Villages Kauai, LLC
Helber Hastert & Fee
WWB
SDWB

Helber Haster
/Name/

November 5, 1999

Mr. Gary Gill
Deputy Director for
Environmental Health
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, HI 96813

Dear Mr. Gill:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 19, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

Wastewater. We appreciate your recommendation to treat wastewater to R-1 standards, because there will be less restrictions on its reuse. We understand that all wastewater plans must conform to the Department of Health's Administrative Rules (HAR), Chapter 11-62 ("Wastewater Systems"), and to the *Guidelines for the Treatment and Use of Reclaimed Water*. We also recognize that the Department will need to review and approve wastewater plans before construction begins.

Safe Drinking Water. We acknowledge the need to comply with the *Rules Relating to Potable Water Systems* (Title 11, Chapter 20, HAR) for the potable water system to be constructed for Kapalawai. We also acknowledge other requirements related to engineering reports, and the provisions of the Safe Water Drinking Act Amendments of 1996 (capacity assurance, operator certification).

Dual Water System. We note that dual water systems must be carefully designed and operated to prevent cross-connections and backflow conditions.

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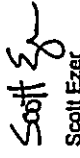
Helber Haster
/Name/

Mr. Gary Gill
November 5, 1999
Page 2

If you have any questions regarding this project, please call me at 545-2055.

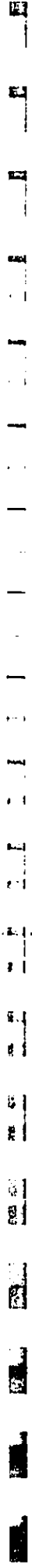
Sincerely,

HELBER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



Dorothea Hayashi
P. O. Box 76
Hanapepe, Hawaii 96716

August 23, 1999

Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Aloha:

Subject: Comments on Kapalawai Resort
Environmental Impact Statement Preparation Notice

In light of the size and anticipated impacts of the proposed Kapalawai Resort, I concur that an Environmental Impact Statement is needed. The Draft Environmental Impact Statement (DEIS) should address the following:

- (1) Project description. While the Preparation Notice provided a description of the project, it provided no information on the context of this proposal. The applicant should provide information on how does this project fits in with the current and future plans for the site and the surrounding Robinson lands. What is the eventual buildout of the project? What other components or phases are being considered, which have not been disclosed in the Preparation Notice?
- (2) Consultant reports. The DEIS should include the consultant reports in their entirety.
- (3) Water. The applicant should disclose the impact of meeting the project's water needs on the landowner's current agricultural activities and future agricultural options for the landowner's remaining lands.
- (4) Recreational resources and recreational uses. The recreational uses of the subject property deserves more attention. A description of the recreational resources of the subject property and ocean are warranted. The significance of these resources should also be disclosed.
- (5) Coastal resources. A description and significance of the coastal resources should be provided.

- (6) Native Hawaiian gathering practices. The DEIS should provide information on native Hawaiian gathering practices on the property and nearby areas, and how native Hawaiian gathering rights will be accommodated.
- (7) Burials. The DEIS should address the possibility of burial on the property.
- (8) Flooding. The DEIS should disclose how the project will mitigate flooding.
- (9) General Plan. It is important to note that the property is not a designated Visitor Destination Area. It is not clear what the applicant plans to do about the designation and what the implications are to the residents of the region.
- (10) Impacts. The DEIS should include a comprehensive assessment of the potential impacts of the project and appropriate mitigating measures or options.

Very truly yours,

Dorothea Hayashi
Dorothea Hayashi

cc: Office of Environmental Quality Control
Destination Villages Kauai, LLC
✓ Helber Hastert & Fee, Planners
State Land Use Commission
Office of Planning

Heller HANBERT
Planners

November 5, 1999

Ms. Dorothea Hayashi
P.O. Box 76
Hanapepe, HI 96716

Dear Ms. Hayashi:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 23, 1999 on the above environmental impact statement preparation notice (EISP). Your letter will be included in the draft environmental impact statement (DEIS) being prepared. For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. **Project Description.** The project described in the EISP and the DEIS is being proposed by Destination Villages Kauai, LLC and not by the Robinson family. The project is self-contained and involves no other phases or components. We are aware that proposals have been presented by the Robinsons on other agricultural land as part of the review and revision of the Kauai General Plan. The Kapalawai project is not tied to any other proposal. While the Robinsons have made public these proposals, they remain just that: proposals. The General Plan revision must undergo a rigorous public review and hearings. Any fundamental changes to this important public policy document are many months away.

2. **Consultant Reports.** A total of 10 consultant reports, in their entirety, will be attached to the DEIS as appendices.

3. **Water.** The project site is located on land that has served as a primary residence for the Robinson family since at least 1897, and has never been used for commercial agricultural purposes. In this regard, the project will have no effect on the landowner's current agricultural activities. Potable water demand for the project is modest in scope, approximately 120,000 gallons per day. This water will be provided by drilling a new well mauka of the property, on other land owned by Gay and Robinson, Inc.

Heller HANBERT
Planners

Ms. Dorothea Hayashi
November 5, 1999
Page 2

4. **Recreational resources and recreational uses.** The recreational uses of the property, both those associated with the resort, and the ocean, will be discussed in the DEIS.

5. **Coastal resources.** One of the consultant reports included in the DEIS will be a marine environmental assessment. This report will describe coastal resources and their significance.

6. **Native Hawaiian gathering practices.** Cultural Surveys of Hawaii prepared a report on the traditional customs and practices associated with the project site. Their report will be discussed in the DEIS, and appended to the DEIS in its entirety.

7. **Burials.** In addition to a review of traditional customs and practices, Cultural Surveys Hawaii prepared an archaeological inventory survey that included a consideration of burials. This report will also be appended to the DEIS.

8. **Flooding.** We are aware that portions of the property are affected by flood hazards. Any structures located in these areas will be elevated above base flood heights, as required by flood hazard regulations, and will otherwise be constructed in compliance with these same regulations. We have also obtained aerial photo documentation of the ocean overwash associated with Hurricane Iniki in 1992, and will be setting all structures mauka of this area. These issues will be addressed in the DEIS.

9. **General Plan.** We acknowledge that the project does not conform to existing General Plan designations, and will require an amendment to the General Plan. That is the reason for the preparation of this DEIS. Chapter 343, Hawaii Revised Statutes requires assessment of all projects in the State of Hawaii that require general plan changes in their respective counties. This DEIS is intended to support an application for a General Plan amendment.

10. **Impacts.** The DEIS will include a comprehensive assessment of the potential impacts of the project and appropriate mitigating measures, as required by Chapter 343, Hawaii Revised Statutes.



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Governor Center, Makai Tower
733 Unidupa Street, Suite 2500
Honolulu, Hawaii 96813
Telephone #808 545-2155
Facsimile #808 545-2050

Helber Hastert
Planners

Ms. Dorothea Hayashi
November 5, 1999
Page 3

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dea Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

BENJAMIN L. CAVETTANO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

August 23, 1999

Mr. Dee M. Crowell
Director
Department of Planning
County of Kauai
Suite 473, Building A
4444 Rice Street
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Kapalawai Resort
Environmental Impact Statement Preparation Notice (EISPN)
TMK: (4) 1-7-05: 01

Thank you for your transmittal requesting our comments on the subject project.

The applicant should be required to include a traffic analysis report in the EIS. This report should identify the impacts to the transportation facilities, particularly at the access points along Kaunualii Highway, and recommend any required mitigation measures.

Very truly yours,

Kazu Hayashida
KAZU HAYASHIDA
Director of Transportation

c: Ms. Genevieve Salmonson, Office of Environmental Quality Control
Mr. Lewis Geyser, Destination Villages Kauai, LLC
Mr. Scott Ezer, Helber Hastert & Fee, Planners

KAZU HAYASHIDA
DIRECTOR
COUNTY DIRECTORS
BRUCE K. MURRAY
GLENN H. DONOFRIO

IN REPLY REFER TO

STP 8.9197

Helber Haster & Fee
Planners

November 5, 1999

Mr. Kazu Hayashida
Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Hayashida:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 23, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

A Traffic Impact Analysis Report (TIAR) will be included in DEIS. The TIAR will identify the impact the proposed development will have to both AM/PM peak and weekend/holiday demand on traffic. The TIAR will also identify any mitigation measures required. We look forward to your comments on this report.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

Helber Haster & Fee
Governor Center, Mahai Tere

733 Hahaione Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050

GTE Hawaiian Tel

Beyond the call

GTE Hawaiian Telephone Company Incorporated
P.O. Box 591 - Lihue, HI 96766 • (808) 241-5050

FLAHERTY

August 27, 1999

Mr. Keith Nitta
County of Kauai
Department of Planning
4444 Rice St., Suite 473
Lihue, HI 96766

Subject: KAPALAWAI RESORT, WAIMEA, TMK 4-1-7-5:1

Thank you for the opportunity to comment on the Environmental Impact Statement Preparation Notice for Kapalawai Resort. GTE Hawaiian Tel will provide telephone service to the proposed development in accordance with our Line Extension and Service Connection Tariff.

An easement site may be required to locate electronic equipment cabinets for the Kapalawai Resort. Such cabinets bring service closer to the customer resulting in improved service and enhanced provisioning capability. The requirement for an easement will depend on the number of telephone lines and the type of services required.

We would appreciate a copy of the final EIS when it becomes available. Should you have any questions, call Jimmy Sone at 241-5052 or Paul Togioka at 241-5054.

Sincerely,

Gay K. Heu

Gay K. Heu
Section Manager-Kauai

C: File
J. Sakasegawa
Tony Lau

A part of GTE Corporation

Helber Haster & Fee
Planners

November 5, 1999

Mr. Gary K. Heu
Section Manager-Kauai
GTE Hawaiian Tel
P.O. Box 591
Lihue, HI 96766

Dear Mr. Heu:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter of August 27, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note your statement that GTE Hawaiian Tel will provide telephone service to the proposed development in accordance with your Line Extension and Service Connection Tariff. We also note your comment that an easement site may be required to locate electronic equipment cabinets for the Kapalawai Resort. We look forward to working with you as the project moves through the development approval process.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dea Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Haster & Fee
Government Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050

THE HAWAIIAN ISLANDS
COMMISSION OF PLANNING

COPY



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
641 Punchbowl Building, Room 555
501 Kalia Avenue
Honolulu, Hawaii 96813

THOMAS E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
SOURCE
JANET E. KAPALEU

ADULTIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RECREATION
INSTRUCTIONS
CONTRACTS
FOUNDED AND MAINTAINED
LAND AND NATURAL RESOURCES
STATE PLANS
WATER RESOURCE MANAGEMENT

August 25, 1999

Mr. Dee Crowell, Director
Planning Department
County of Kauai
4444 Rice Street, Suite 473
Lihue, Kauai, Hawaii 96766

LOG NO. 23988 ✓
DOC NO. 9908NN405

Dear Mr. Crowell:

**SUBJECT: Chapter 6E-42, Historic Preservation Review -EISP/N Kapalawai
Resort Wainaea, Kauai T.M.K.: 1-7-05- 01**

We are currently reviewing the archaeological report for this project and will submit a copy of our review letter on this work once it is complete

From initial review of the report and from the EIS Prep Notice, it appears that 5 historic sites (rock walls and terraces, oval platform, main house complex, inland fishpond and a Portuguese Oven) are in the project area. The mitigation proposal is to preserve all these sites, and possibly restore some.

In concept, we agree with the plan, but we must withhold comment until our review of the report is completed.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

Don Hibbard
DON HIBBARD, Administrator
State Historic Preservation Division

NMH/m

cc: Gary Gill, Director, Office of Environmental Quality Control 235 South Beretania St.
Honolulu, HI 96813
Scott Ezer, Helber, Haster & Fee Planners, 733 Bishop Street, Suite 2590, Honolulu, HI 96813

Helber Haster
Planners

November 5, 1999

Mr. Don Hibbard, Administrator
Historic Preservation Division
State of Hawaii
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
501 Kamohila Boulevard
Kapolei, HI 96707

Dear Mr. Hibbard:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 25, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that your office is currently reviewing the archaeological report for this project and you will submit a copy of your review letter on this work once it is complete. We also point out that your office is also in receipt of a traditional customs and practices report, and has concurred with the findings of an architectural analysis of structures on the property (LOG NO: 24198; DOC NO: 9910co05), for the same project.

If you have any questions regarding this project, please call me at 545-2055.
Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

Helber Haster & Fee
Governor Center, Makai Tower

733 Bishop Street, Suite 2570
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050



Kauai Civil Defense Agency
4306 Rice Street, 107
Lihue HI 96766
BUS: 808 241-6338
FAX: 808 241-6228
E-MAIL: cdagency@kca.state.hi.us

'99 AUG -4 P 3 1

Memo

PLANNING DEPT.

To: Department of Planning
County of Kauai
4444 Rice Street, 473
Lihue, HI 96766

Attn: Keith Nitta

From: Clifford Ikeda, Acting CD Administrator *W*

Subject: Comments - EISPN for Kapalawai Resort

1. Disaster Alerting and Notification

Unit occupants at the proposed site appear to be at risk from tsunami, flooding, tropical cyclone and chlorine release (from STP).

For the safety of the guests, there must be a system in place by which the resort is alerted of the aforementioned threats without depending on direct telephone notification from the local disaster preparedness agency.

NOTE: Does not the County of Kauai require speakers in each unit where broadcast may be made for delivering instructions to entire property?

2. Units in Tsunami Inundation Zone

3. How do the occupants call for help (i.e. medical emergency, fire, crime in progress, etc.) without telephoning in the units?

Helber Haster
Planners

November 5, 1999

Mr. Clifford Ikeda, Acting Civil Defense Administrator
Kauai Civil Defense Agency
4396 Rice Street, 107
Lihue, HI 96766

Dear Mr. Ikeda:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note your concern about the ability to warn guests about disasters. A system will be included in the design of the resort that will allow communication with the cottages to alert guests about emergency situations. For your information, the Director of the State Office of Civil Defense has requested that the project should install an outdoor warning siren, and an Emergency Alert System as part of the development.

There is a reference in your letter to units in the tsunami inundation zone. Only a small portion of the property is affected by the VE Flood Zone, and no buildings will be located in this area.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Haster & Fee
Governor Center, Makai Tower

733 Hilday Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
Pacific Islands Area Office
1601 Kapoloani Boulevard, Suite 1110
Honolulu, Hawaii 96814-0047

OCT 1 1999

Mr. Kerith Nitta
County of Kauai
Department of Planning
4444 Rice St., Suite 473
Lihue, Kauai 96766

Re: Environmental Impact Statement Preparation Notice (EISPN) Prepared Pursuant to Chapter 343, HRS.

Dear Mr. Nitta:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice for Kapalawai Resort. The notice was received by our office July 23, 1999. We've completed our review and various recommendations follow.

The proposed project involves the development of a 250-unit resort complex on the former homestead of the Robinson Family. The plans include the restoration of existing features of the property (a spring fed fishpond) and amendment of the complex with other facilities such as the proposed waste water treatment plant. One of the stated goals of the plan is to "provide for a maximum variety of outdoor recreational activities."

The National Marine Fisheries Service (NMFS) recommends that the draft Environmental Impact Statement (DEIS) address the development plans in terms of the potential effects it might have on protected marine species. Although the EISPN does contain a review of terrestrial flora and fauna potentially affected by the project, there are no marine flora or fauna discussed in the EISPN. To provide comprehensive information for the planning process, NMFS recommends that the applicant pay particular attention to the potential effects on sea turtles, Hawaiian monk seals and the potential effects on the habitat of these species.

Questions the applicant should consider are the effects of the construction activities on marine protected species. Breeding sea turtles and/or hatchlings in the area may become disoriented if bright lights shine on the water or beach at night during the breeding/hatching season. Accordingly, the applicants should tailor construction and/or administration of the resort facility so that lighting does not affect the normal behavior of sea turtles. Also, Hawaiian monk seals may haul out on the shore. Again, the development activities must consider methods of operation which do not disrupt the normal behavior of the monk seals.

As is often the case, resorts with ocean front access develop marine recreation activities designed to entertain resort visitors. NMFS recommends the EIS describe in full the planned ocean recreation uses that would be a part of the resort operation. Thus, the proposal of any




ocean recreation activities should take into consideration the potential effects on marine protected species and possible mitigation measures.

NMFS recognizes that it is early in the planning and review process, and that the applicant may have questions or require information from our office regarding the concerns raised above. Please feel free to contact Margaret Dupree of the Pacific Islands Area Office Protected Species Program at (808) 973-2935 (ext. 210) for more information or future correspondence.

Additionally, the applicant may wish to contact the Fish and Wildlife Service, and the Department of Land and Natural Resources, Divisions of Aquatic Resources and Forestry and Wildlife for recommendations for species under their jurisdiction.

Sincerely,


Charles Kamella
Administrator, Pacific Islands Area Office

cc: USFWS - Pacific Islands Ecoregion
DAR - Hawaii
DOFAW - Hawaii
CZMP - Hawaii
Destination Villages Kauai, LLC
Helber Hastert & Fee, Planners

Helber Hastert
Planners

November 5, 1999

Mr. Charles Kamella, Administrator
Pacific Islands Area Office
National Marine Fisheries Service
2570 Dole Street
Honolulu, HI 96822

Dear Mr. Kamella:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated October 1, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

The DEIS will contain several studies related to the native fish, wildlife, and plant resources that exist in the affected environment. These include a botanical survey (Char & Associates), a terrestrial faunal survey (Philip Bruner), and a marine biological survey (Marine Research Consultants). Each of these reports will be summarized in the DEIS and attached to the document as a technical appendix.

As you state in your letter, we are still early in the planning and review process, and we have not yet determined the full range of activities that will be provided for on the property. However, we believe that most ocean-oriented recreation (snorkeling, diving, windsurfing, kayaking, etc.) will take place off-site.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Hastert & Fee
Customer Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

ENERGY, RESOURCES, AND TECHNOLOGY DIVISION
235 South Beretania St., 5th Fl., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

BENJAMIN J. CATELANO
GOVERNOR
SELIE F. MATA
BRADLEY J. MOSENIER
DEPUTY DIRECTOR

Tel.: (808) 587-3807
Fax: (808) 586-2536

Mr. Keith Nitta
Page 2
July 29, 1999

July 29, 1999

Mr. Keith Nitta
County of Kauai
Department of Planning
4444 Rice St., Suite 473
Lihue, HI 96766

Dear Mr. Nitta:

Subject: Environmental Impact Statement Preparation Notice (EISP/N)
Kapalawai Resort, Waimea, Kauai
Tax Map Key: (4) 1-7-05:01

Thank you for the opportunity to comment on the EISP/N for Kapalawai resort. Our comments are addressed to (1) State energy conservation goals, (2) energy saving design practices and technologies, and (3) recycling and recycled-content products.

(1) Energy conservation goals. Project buildings, activities, and site grounds should be designed with energy saving considerations. The mandate for such consideration is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226 ("Hawaii State Planning Act"). In particular, we would like to call to your attention HRS 226 18(c)(4) which includes a State objective of promoting all cost-effective energy conservation through adoption of energy-efficient practices and technologies.

The County of Kauai has an Energy Code and we would suggest that you consider that in implementing your project. Kauai Electric may also have demand-side management programs that offer rebates for energy efficient technologies.

(2) Energy saving design practices and technologies. We recommend that you specifically address energy efficient design practices and technologies in this project. Some of the methods and technologies that could be considered during the design phase of the project include:

- a. Use of site shading, orientation, and use of naturally ventilated areas to reduce cooling load;
- b. Maximum use of day lighting;
- c. Use of high efficiency compact fluorescent lighting;
- d. Use of high wattage metal halide lighting for sports and recreational areas;

- e. Exceed Energy Code requirements; and
 - f. Technologies such as solar water heating systems, roof insulation, radiant barriers, and energy efficient windows.
- (3) Recycling and recycled-content products.
- a. Develop a job-site recycling plan for the construction phase of the project and recycle as much construction and demolition waste as possible;
 - b. Incorporate provisions for recycling into the built project - a collection system and space for bins for recyclable;
 - c. Specify and use products with recycled-content such as: steel, concrete aggregate fill, drywall, carpet and glass tile; and
 - d. Specify and use locally produced products such as plastic lumber, hydromulch, soil amendment and glass tile.

Sincerely,

Maurice H. Kaya
Energy, Resources, and Technology
Program Administrator

c OEQC
Destination Villages Kauai, LLC
Helber Hastert & Fee, Planners (Attn: Scott Ezer)

Helber Haster
Planners

November 5, 1999

Mr. Maurice H. Kaya
Energy, Resources, and Technology
Program Administrator
Department of Business, Economic Development & Tourism
Energy Resources, and Technology Division
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Kaya:

**Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii**

Thank you for your letter dated July 29, 1999, on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared. For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. Energy Conservation Goals

The philosophy of the project developer strongly supports the use of cost-effective energy conservation and energy-efficient practices and technologies. In support of these objectives, solar water heating, energy-efficient pumps, appliances and lighting, and daylighting techniques for larger buildings will be incorporated into the design of the proposed resort. This philosophy is embodied in a decision to design the 250 cottages without air conditioning systems. Ceiling fans, building orientation, appropriate materials, exterior colors, and landscaping will all contribute to keeping the cottages cool.

2. Energy Saving design practices and technologies

The developer intends to construct the 250 cottages without air conditioning. This will make it essential to carefully develop a landscape plan that is not only attractive, but functional in the provision of adequate site shading and ventilation. All appropriate technologies and appliances that provide reduced energy consumption will be considered for incorporation into the project.

Helber Haster & Fe
Governor Center, Mahai Therr

733 Hialeah Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

Helber Haster
Planners

Mr. Maurice Kaya
November 5, 1999
Page 2

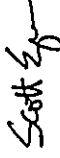
3. Recycling and recycled-content products

Recycling is also an important objective pursued by the project developer. In addition to recycling during construction, it will be very important to devise and implement an aggressive operational recycling program for the resort, including green waste. We have already decided to use reclaimed wastewater as an irrigation source on the property.

If you have any additional questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC





United States Department of the Interior

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

August 20, 1999

Mr. Keith Nitta
Department of Planning
County of Kauai
4444 Rice St., Suite 473
Lihue, HI 96766

Dear Mr. Nitta:

Subject: Environmental Impact Statement Preparation Notice (EISP/N), Kapalawai Resort, Island of Kauai, Tax Map Key: (4) 1-7-05:01, Waimea

The staff of the U.S. Geological Survey, Water Resources Division, Hawaii District Office, has received the EISP/N. We regret however, that due to prior commitments and lack of available staff, we are unable to review the document and are returning it for your future use.

Thank you for allowing us the opportunity to review and comment on this document.

Sincerely,

John M. Klein
John M. Klein
Acting District Chief

Enclosure

cc w/o enclosure: Mr. Lewis Geysler
Destination Villages Kauai, LLC
4439 Via Abriagada
Santa Barbara, CA 93110

Mr. Scott Ezer
Helbert Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Helbert Hastert
Planners

November 5, 1999

Mr. John M. Klein
United States Department of the Interior
U.S. Geological Survey
Water Resources Division
677 Ala Moana Boulevard, Suite 415
Honolulu, HI 96813

Dear Mr. Klein:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 20, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that due to prior commitments and lack of available staff, you are unable to review the EISP/N.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBERT HASTERT & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

Helbert Hastert & Fee
Governor Center, Mahai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



DEPARTMENT OF WATER
County of Kauai

"Water has no Substitute - Conserve it"

August 9, 1999

Keith Niita
Planning Department
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Subject: Environmental Impact Statement Preparation Notice for Kapalawai Resort
on TMK:1-7-5:1, Kaunualii Highway, Kauai.

We have no comments to the proposed Environmental Impact Statement Preparation Notice for the Kapalawai Resort, provided the applicant is made aware that the proposed project is outside general planned development area for the Waimea water system. Domestic water service for this project will not be available from the Department of Water, County of Kauai.

If you have any questions, please call Edward Doi at 245-5417.

Sincerely,



Ernest Y.W. Lau
Manager and Chief Engineer

- cc: a. Office of Environmental Quality Control
235 S. Beretania St., Suite 702, Honolulu, HI 96813
b. Destination Villages Kauai, LLC
4439 Via Brigada, Santa Barbara, CA 93110, attn: Lewis Geyser
c. Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590, Honolulu, HI 96813, attn: Scott Ezer

EJd/bb
A:\Kapa\w\ESPN\Fed

Phone No. (808) 245-5400 - Administration FAX No. (808) 246-8678 - Engineering/FiscalShop FAX No. (808) 245-5813
- 4398 Pua Loke Street, Lihue, Kauai, Hawaii or P. O. Box 1706, Lihue, HI 96766-5706 -

Helber Hastert
Planners

November 5, 1999

Mr. Ernest Y.W. Lau
Manager and Chief Engineer
Department of Water
County of Kauai
4398 Pua Loke Street
Lihue, HI 96766

Dear Mr. Lau:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

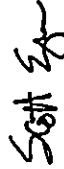
Thank you for your letter dated August 9, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that other than pointing out that domestic water service for the proposed project will not be provided by the Department of Water, you have no other comments on the EISP/N.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



Helber Hastert & Fee
Governor Center, Mahai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050



BEVERLY J. CATERINO
COMMISSIONER

FACILITIES UNIT

PAUL G. LE MAHIEU, Ph.D.
SUPERINTENDENT



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2789
HONOLULU, HAWAII 96808

OFFICE OF THE SUPERINTENDENT

August 4, 1999

Mr. Dee M. Crowell
Planning Director
County of Kauai Planning Department
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Kapalawai Resort EISPN

The Department of Education has no comment on the subject environmental impact statement.

Thank you for the opportunity to respond.

Very truly yours,

Paul G. LeMahieu, Ph.D.
Superintendent of Education

|| PLem:al (cse)

cc: Gary Gill, OEQC
Lewis Geysler, Destination Villages Kauai, LLC
Scott Ezer, Helber Hastert & Fee Planners

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

Helber Hastert
Planners

November 5, 1999

Dr. Paul G. LeMahieu
Superintendent of Education
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, HI 96804

Dear Dr. LeMahieu:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 4, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that you have no comment on the EISPN.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

Helber Hastert & Fee
Grower Center, Mahai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone: 808 545-2055
Facsimile: 808 545-2050



Helber Haster & Fee
Planners

(P) 1600.9



November 5, 1999
Mr. Gordon Matsuoka
Public Works Administrator
Department of Accounting and General Services
Division of Public Works
P.O. Box 119
Honolulu, HI 96810
Dear Mr. Matsuoka:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 27, 1999 on the above environmental impact statement preparation notice (EISP). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that the project will have no impact on your facilities.
If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

AUG 27 1999

Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Kauai, Hawaii 96766
Attention: Mr. Keith Nitta

Gentlemen:

Subject: Kapalawai Resort
Waimea, Kauai, Hawaii
Draft Environmental Impact Statement Preparation
Notice

Thank you for the opportunity to review the subject document. The proposed project will have no impact on our facilities. Therefore, we have no comments to offer.

Should you have any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0737.

Sincerely,

Gordon Matsuoka
GORDON MATSUOKA
Public Works Administrator

RY:mo
C: OEQC
Destination Villages Kauai, LLC
Helber, Haster & Fee, Planners

Telephone: 808.515.2055
Facsimile: 808.515.2050

733 Hihau Street, Suite 2590
Honolulu, Hawaii 96813

Helber Haster & Fee
Grainger Center, Makai Tower



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96819-6440

MEMO TO
ATTENTION OF

August 10, 1999

Civil Works Technical Branch

Mr. Keith Nitta
County of Kauai
Department of Planning
4444 Rice Street, Suite 473
Lihue, Kauai, Hawaii 96766

Dear Mr. Nitta:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISP) for the Kapalawai Resort Project, Waimea, Kauai (TMK 1-7-5: 1). The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

- a. Based on the information provided, a DA permit may be required for the project. For further information, please contact Mr. William Lennan of our Regulatory Branch at 808) 438-9526 (extension 15) and refer to file number 990000433.
- b. The flood hazard information provided on page 21 of the EISP is correct.

Sincerely,

James Pennaz
James Pennaz, P.E.
Acting Chief, Civil Works
Technical Branch

-2-

Copies Furnished:

Mr. Gary Gill
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Mr. Lewis Geyser
Destination Villages Kauai
4439 Via Abridaga
Santa Barbara, California 93110

Mr. Scott Ezer
Heiber Hastert and Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Helber Haster
Planners

November 5, 1999

Mr. James Pennaz, P.E.
Acting Chief, Civil Works Technical Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter Hawaii 96858-6440

Dear Mr. Pennaz:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 10, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We acknowledge that a Department of the Army permit may be required for some activities associated with the proposed resort. This would include clearing the fishpond of silt and noxious vegetation, and constructing a vehicular and pedestrian bridge over Mahaikona Stream. We also note your statement that the flood hazard information provided in the EISPN is correct.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

Helber Haster & Fee
Governor Center, Mahai Tower

733 Hialeah Street, Suite 2550
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

MARYANNE W. KUSAKA
MAYOR

WALLACE G. REZENTES, SR.
ADMINISTRATIVE ASSISTANT



AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MOTIHEHA BUILDING, SUITE 275
LIHUE, KAUAI, HAWAII 96766
July 28, 1999

CESAR C. PORTUGAL
COUNTY ENGINEER
TELEPHONE 241-6600

IAN K. COSTA
DEPUTY COUNTY ENGINEER
TELEPHONE 241-6640

Mr. Dee Crowell, Planning Director
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Attention Mr. Keith Niita

Dear Mr. Crowell:

SUBJECT: EISPN, KAPALAWAI RESORT, TMK 1-7-05: 01

We would like to offer the following comments on the project.

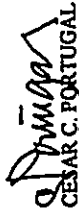
1. The project will access to Kaunualii Highway which is under the jurisdiction of the State of Hawaii, Department of Transportation, Highway Division. Comments relative to access should be solicited from the Highway Division.
2. The notice refers to the FEMA Flood Insurance Rate Maps and flood studies conducted by Wagner Engineering Services for flood zones and elevations. We will need to review Wagner Engineering Services flood studies for the Mahaikona and Aakukui Stream. We will also need to review the study and drainage proposals for the Nonopahu Ridge Drainage Basin. County Flood Plain Management Ordinance requires structures to be protected from the 100-year storm.

Thank you for the opportunity to offer our comments.

Mr. Dee Crowell, Planning Director
July 28, 1999
Page 2

Please contact Kenneth Kitabayashi at 241-6622 if there are questions.

Very truly yours,


CESAR C. PORTUGAL
County Engineer

KK/cu

cc OEQC
Destination Villages Kauai, LLC
Heber Haster & Fee, Planners

Helber Hastert
Planners

November 5, 1999

Mr. Cesar C. Portugal, County Engineer
County of Kauai
Department of Public Works
4444 Rice Street
Mo'ikeha Building, Suite 275
Lihue, HI 96768

Dear Mr. Portugal:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated July 28, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that Kaunua'ali Highway is under the jurisdiction of the State of Hawaii, Department of Transportation (DOT). We have also transmitted a copy of the EISPN to the DOT. Their comment letter on the EISPN will also appear in the DEIS.

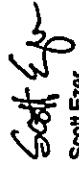
A drainage study conducted by Wagner Engineering Services will be appended to the DEIS in its entirety, for your review. We will also encourage representatives of Wagner Engineering Services to maintain close coordination with your agency during the EIS review process, and any subsequent permit applications through the County of Kauai.

We acknowledge that the County Flood Plain Management Ordinance requires structures to be protected from the 100-year storm. All areas of the project affected by flooding will be identified in the DEIS.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



Helber Hastert & Fee
Granovier Center, Mahai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

REXHAMM J. CAFFERTANO
DIRECTOR

MAJOR GENERAL, COMMANDER & INSPECTOR
GENERAL OF CIVIL DEFENSE

ROY G. PRICE, SR.
VICE DIRECTOR OF CIVIL DEFENSE



STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMONDHEAD ROAD
HONOLULU, HAWAII 96818-4865



PHONE (808) 733-4320
FAX (808) 733-4787

Mr. Keith Nitta
August 2, 1999
Page 2

We appreciate your consideration and interest on this matter. Our SCD planners and technicians are available to discuss any concerns your staff may have. Please contact Mr. Norman Ogasawara of my staff at (808) 733-4300.

Sincerely,

ROY G. PRICE, SR.
Vice Director of Civil Defense

c: Destination Villages Kauai, LLC
Heiber Hasler & Fee, Planners
Kauai Civil Defense Agency

August 2, 1999

Mr. Keith Nitta
Department of Planning
County of Kauai
4444 Rice Street, Suite 475
Lihue, Kauai, Hawaii 96766

Dear Mr. Nitta:

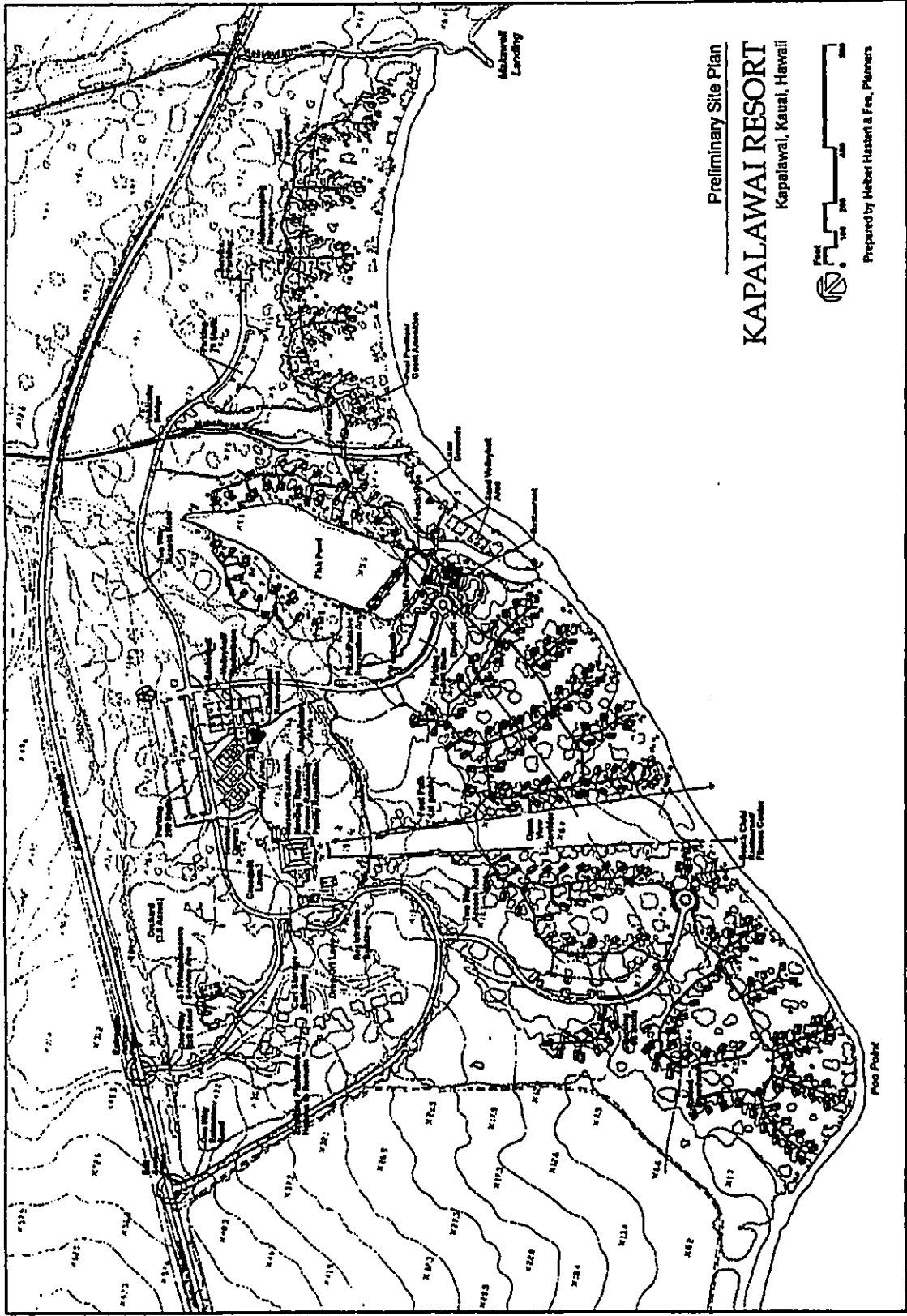
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
(EISPN), KAPALAWAI RESORT

We appreciate the opportunity to comment on the Kapalawai Resort EISPN for Destination Villages Kauai, LLC.

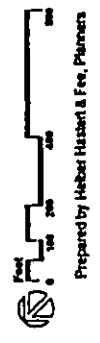
State Civil Defense (SCD) recommends that a 121 DBc omnidirectional, solar powered outdoor warning siren be provided by the developer. The siren should be installed near the northeast corner of the 200 stall parking lot.

SCD also requests that an Emergency Alert System (EAS) receiver be purchased as a backup to the siren and installed near the telephone operator or in the security office. When installed, they could call the individual guest facilities or the complex; security officers may be able to warn or assist the elderly and disabled.

Just as parks, schools, fire hydrants, underground/overhead utilities and sidewalks are planned as integral parts of planned developments, an emergency warning system and support infrastructure must be purchased and installed by the developer for the safety and well-being of the residents and/or guests.



Preliminary Site Plan
KAPALAWAI RESORT
 Kapalawai, Kauai, Hawaii



Prepared by Heber Harbert & Fee, Planners

Helmer Hastert
Planners

November 5, 1999

Mr. Roy C. Price, Sr.
Vice Director of Civil Defense
State of Hawaii
Department of Defense
Office of the Director of Civil Defense
3949 Diamond Head Rd.
Honolulu, HI 96816-4495

Dear Mr. Price:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 2, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note your request that the project include one 121 Db omnidirectional, solar-powered siren, and an Emergency Alert System (EAS) receiver. We look forward to working with you on the siting and selection of appropriate equipment.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helmer Hastert & Fee
Governor Center, Mahai TOWER

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813
Telephone 808 545-2055
Facsimile 808 545-2050



BENJAMIN J. CAYETANO
DIRECTOR

GENEVEVE SALMONS-D-
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

318 SOUTH BERTANHA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE 808/548-4185
FACSIMILE 808/548-4186

July 21, 1999

Dee Crowell
Kauai Planning Department
4444 Rice Street, #473
Lihue HI 96766

Atrn: Keith Nitta

Dear Mr. Crowell:

Subject: Environmental Impact Statement (EIS) Preparation Notice for Kapalawai Resort, Makaweli

In order to reduce bulk and conserve paper, we recommend printing on both sides of the pages in the draft EIS. In addition, please discuss the following in the draft EIS:

1. Capacity: The development will have 250 cottages. What is the anticipated maximum occupancy? A total of 465 parking spaces is indicated on the site plan. How many will be for guests and how many for staff?
2. Shoreline setback: What is the shoreline setback for this section of the coast? Will any of the development encroach upon it?
3. Historic features: Will any of these features be listed on the state or Federal registers?
4. Site plan: The site plan needs to be labelled as Figure 4.
5. Resource conservation measures:

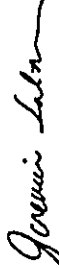
► Please consider applying sustainable building techniques presented in the enclosed "Guidelines for Sustainable Building Design in Hawaii" in the construction of the facilities. In the draft EIS include a description of any of the techniques you will implement.

► Will composting be used to reduce the volume of generated green waste that would otherwise go to the landfill? What measures will be taken to reduce or reuse other solid wastes generated?

6. Landscaping: Describe the landscaping that is planned for this development. We encourage the use of native Hawaiian trees and plants.

If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,


GENEVIEVE SALMONSON
Director

Enc.

c: Scott Ezer, Heiber Hasterl & Fee
Lewis Geyser, Destination Villages Kaula

Heiber Hasterl
Planners

November 5, 1999

Ms. Genevieve Salmonson, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Dear Ms. Salmonson:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kaula, Hawaii

Thank you for your letter dated July 21, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. **Capacity.** Occupancy statistics for other similar facilities in Hawaii indicate an average room occupancy of 1.95 persons. If 100 percent of the cottages were to be occupied with an average occupancy of 1.95 persons, the number of guests at the resort would equal about 487. However, the number of vehicles used by these guests would be close to 1 vehicle per cottage, leaving about 215 spaces available for employees and the public who wish to reach the beach through the property.
2. **Shoreline Setback.** The minimum shoreline setback for the County of Kaula is 40 feet. However, there is a strip of property along the shoreline that lies within the State Conservation District. There are no plans to amend the State Land Use District designation for this portion of the property. At this time, we are unable to specifically report the depth of this strip of property. We have asked the State Land Use Commission for a boundary interpretation for this area. Final resolution of the boundary will be dependent on the results of a Shoreline Survey Certification, which is currently pending.
3. **Historic Features.** Although many of the historic features found on the property are eligible for listing on the State and Federal Registers of Historic Places, there is no plan to have them listed at this time. All historic resources will either be repaired and restored and incorporated

Heiber Hasterl & Fee
Greenwood Center, Mahai Tower

733 Bishop Street, Suite 2500
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



Heiber Haster
Planners

Ms. Genevieve Salmonson
November 5, 1999
Page 2

into the design of the resort as functional structures, or will be left in place "as-is."

4. Site Plan. The Site Plan will be labeled as Figure 4 in the DEIS.
5. Resource Conservation Measures. Resource conservation will be a fundamental component of the resort. The cottages will not be air conditioned, and will be sited to take maximum advantage of shade provided by the many large trees on the property. The boardwalk system will be constructed with recycled building products, and alternative energy systems (such as solar water heaters) will be employed for use in the cottages. Green waste will be composted to reduce the volume of generated solid waste. In addition, an aggressive recycling program will be instituted at Kapalawai, to reduce the volume of other solid waste.
6. Landscaping. At this time, a landscaping plan for the resort has not been drafted. However, the site has a significant number of mature trees (milo, kawe, monkeypod, etc.) that can be incorporated into the design of the project. Other native landscaping will be selected to be compatible with the dry environment of the Waimea District to reduce irrigation and maintenance requirements. Vegetation that is more suited to a particular environment will be healthier in the long run.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELPER HASTER & FEE, Planners



Scott Exer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3122
Box 50088
Honolulu, Hawaii 96850

AUG 23 1999

In Reply Refer To: LLLW

Mr. Keith Nitta
County of Kauai
Department of Planning
4444 Rice St. Suite 473
Lihue, HI 96766

Re: Environmental Impact Statement Preparation Notice for the Kapalawai Resort, Kauai, Hawaii

Dear Mr. Nitta:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced June 1999 Environmental Impact Statement (EIS) Preparation Notice, which was received in our office on July 23, 1999. The project sponsor is Destination Villages Kauai, LLC. The Service offers the following comments for your consideration as you assist the project sponsor in planning the proposed project.

The proposed project involves the development of a 250-unit resort with accessory facilities including the restoration of several existing features. These features include a residence, a fishpond, and grounds that incorporate streams, springs, and beachfront.

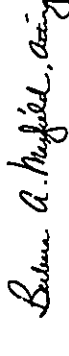
The Service recommends that the draft EIS address potential project-related impacts to Federal trust resources, including species and habitats protected under the Endangered Species Act, migratory birds, wetlands, and coral reef ecosystems. The draft EIS should also address potential impacts to other native Hawaiian species and habitats. For instance, the draft EIS should discuss whether any of the construction activities or proposed lighting for the project may pose a nuisance to any sea turtles, monk seals, or seabirds that may utilize the area. For the endangered bat and waterbirds mentioned in the Preparation Notice, the draft EIS should assess the extent and type of impacts expected to occur to these species from the proposed project, including discussions of whether these species use the project area for nesting or breeding, or simply as feeding and loafing areas. The extent of the impacts may depend heavily on when and how long these species occupy the area. We recommend you contact both the National Marine Fisheries Service and the Department of Land and Natural Resources, Division of Aquatic Resources, and the Division of Forestry and Wildlife for

recommendations concerning resources under their jurisdiction.

The draft EIS should propose mitigation measures to avoid unnecessary impacts and minimize unavoidable impacts to these resources. For example, we recommend that consideration be given to avoidance of the primary breeding seasons of listed species in the area to reduce adverse project-related impacts to their successful reproduction. If lighting may prove to be a potential nuisance, we recommend that minor adjustments such as light poles no higher than 25 feet or shielded or subdued lighting be used.

The Service appreciates the opportunity to provide this early technical assistance, and we look forward to reviewing a copy of the draft EIS when it is available. If you have questions regarding these comments, please do not hesitate to contact Fish and Wildlife Biologist Lorena Wada by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,



Robert P. Smith
Pacific Islands Manager

cc: USEPA - Region IX, Honolulu
NMFS-PIAO, Honolulu
DAR, Hawaii
DOFAW, Hawaii
CZMP, Hawaii
CWB, Hawaii
Destination Villages Kauai, LLC
Helber Hastert & Fee, Planners

Helber Hastert
Planners

November 5, 1999

Mr. Robert Smith
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Ecoregion
300 Ala Moana Blvd., Room 3-122
Box 50088
Honolulu, HI 96850

Dear Mr. Smith:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 23, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

The DEIS will contain several studies related to the native fish, wildlife, and plant resources that exist in the affected environment. These include a botanical survey (Char & Associates), a terrestrial faunal survey (Philip Bruner), and a marine biological survey (Marine Research Consultants). Each of these reports will be summarized in the DEIS and attached to the document as a technical appendix. We did forward copies of the EISPN to the National Marine Fisheries Service (NMFS) and Department of Land and Natural Resources for their review. Only NMFS provided comments on the EISPN.

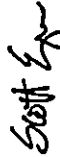
The DEIS will include mitigation measures to avoid impacts to biological resources, including the need to direct lighting away from the shoreline area.

We look forward to working with the Service during the planning for this project.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners


Scott Ezar
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Hastert & Fee
Crownover Center, Makai Tower
733 Hiehing Street, Suite 2590
Honolulu, Hawaii 96813
Telephone: 808 545-2055
Facsimile: 808 545-2050

ROYALTY I. CAITANO
GOVERNOR
STATE OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOMELANDS
P.O. BOX 1878
HONOLULU, HAWAII 96805

RAYNARD C. SOON
CHAIRMAN
HAWAIIAN HOMES COMMISSION
JOSE M. M. TAMAGUCHI
DEPUTY TO THE CHAIRMAN

August 4, 1999

Mr. Keith Nitta
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Nitta:

Subject: Kapalawai Resort Environmental Impact Statement
Preparation Notice; TMK 1-7-05:01, Waimea, Kauai

Thank you for allowing our review of the subject report dated June 1999.

The proposed resort is located within three miles of a 47-unit housing subdivision being developed on Hawaiian home lands at Hanapepe. More information as to the types and numbers of jobs that will be available at the resort would be of interest to our homesteaders and other West Kauai residents. Resort prices would be of general interest.

Emergency communication needs should be assessed in view of the statement on Page 2 that no cooking facilities, phones, or televisions will be provided to the 250 visitor cottages.

If there are any questions regarding our comments, please call Joe Chu at 587-6421.

Aloha,

Raynard C. Soon
Raynard C. Soon, Chairman
Hawaiian Homes Commission

c: Destination Villages Kauai, LLC
Helber Hastert & Fee, Planners

Helber Hastert
Planners

November 5, 1999

Mr. Raynard C. Soon, Chairman
State of Hawaii
Hawaiian Homes Commission
Department of Hawaiian Home Lands
P.O. Box 1878
Honolulu, HI 96805

Dear Mr. Soon:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 4, 1999 on the above environmental impact statement preparation notice (EISP/N). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

An economic and fiscal impact assessment was prepared for the project, and is appended to the DEIS in its entirety. The report estimates that about 200 full time equivalent positions will be created by the resort, in a wide variety of job categories. The estimated annual payroll for the resort is approximately \$5.3 million.

In terms of resort prices, an underlying assumption of the fiscal impact assessment was that the achieved room rate would be about \$185 (this takes into consideration rack rates and discounted rates, such as kama'ahua rates).

We note your comment concerning emergency communication. We received similar comments from others. We also believe it is essential to include some communication system to ensure that guests can be adequately warned about impending disaster situations.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Hastert & Fee
Governor Center, Makai Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050

TO: Planning Department
FM: Fire Department
RE: Comments for EIS
Kapalawa Resort
Waimea, Kauai, Hawaii
TMK: 1-7-05:01

COMMUNICATIONS SECTION
99 JUL 19 11:00
PLANNING DEPT.

Thank you for the opportunity to comment on this proposed development as the size of the project does have significant impact on the resources available to the Fire Department with regards to emergency access and response. We would have no objection to the project as proposed if the Applicant addresses and resolves the following areas of concern:

1. There is no mention in the EIS preparation document of the development of fire protection infrastructure for the proposed project. Although the Applicant submits that the overall structure density will (only) be 1.5 units per acre, the cottage units are configured and clustered in such manner that a situation of conflagration may result with a fire within any of the units. The Applicant also proposes to provide generous landscaping around each unit which would exacerbate these conditions of conflagration, creating a connective path for fire to spread from one structure to another and so forth.

■ The development of an approved, private fire protection system having a reliable and potable water source, tank storage supply, pipelines, and fire hydrants is required and necessary to provide adequacy of fire protection facilities in the event of a fire emergency.

■ The landscaping on the project site shall be planned to minimize or eliminate conditions where fire from one unit can spread to another through the surrounding shrubbery by selecting the following alternatives:

- (A) Provide and maintain adequate separation set-backs from the landscaping to each of the units to minimize connective paths for fire to travel;
- (B) Plant fire-resistant vegetation so that the circumstances for connective fire travel is eliminated;
- (C) Construct units using fire-resistant or non-combustible materials;
- (D) Install automatic fire sprinkler systems in each of the units;
- (E) Any approved alternative that would meet the intent of these considerations;
- (F) Multiple selections of the above options.

2. The Applicant represents that a main pedestrian arterial (raised boardwalk) would connect cottages to adjacent parking areas and activity centers and

vehicular access would be restricted to registration, parking areas, and restaurants located on the property. The proposed configuration of vehicular access routes do not take into account emergency access to units. Fire apparatus are generally heavy vehicles with limited maneuverability, thus have special requirements for access.

■ Provide an approved circulation route into or around clusters of cottages for emergency access. The route shall be a designated 20-foot wide fire lane closed to general traffic and designed with an all-weather surface that would accommodate the weight of fire apparatus loads, upward of 20-tons. The fire lane turning radiuses and degree of slope shall also be approved. Construction of the all-weather surface may be any of these or another approved alternate method: asphalt paving, concrete, gravel, grass-crete, grass-rings, etc. The fire lane shall be equipped with approved turnarounds and/or areas for fire-fighting operations (turn-offs).

Other alternatives for such emergency access may be considered. Private fire hydrants shall be positioned along the emergency access route in locations approved by the Fire Department. The Applicant shall install Knox Boxes to provide emergency access in lieu of providing keys to gates. The fire lane could also serve as a "fire break" between clusters of cottages.

3. Since cottages will not be equipped with phones, a means of alerting the Project's Registration Office or calling 911 directly in the event of an emergency, be it fire or medical or rescue is required.

■ Install a fire alarm and/or call-alert system for notification in the event of an emergency. Any delay in notification increases the danger to persons and multiple structures, resulting in greater risk of liability to the Applicant.

Usually single-station smoke detectors would be installed within these cottages, however, the Applicant could install an addressable system to a centrally-located and monitored fire alarm control station.

■ A phone system may also be installed.

We advise the Applicant to make an appointment with the Fire Prevention Bureau at their earliest convenience to begin discussions in addressing and resolving these critical issues to protect the health and safety of employees and guests, and preserve the value of the proposed and existing improvements on the property.


For: Fire Prevention Bureau
(808) 241-6511


Fire Chief

Helber Haster
Planners

November 5, 1999

Mr. David K. Sproat, Fire Chief
Fire Department
County of Kauai
4444 Rice Street, Suite 285
Lihue, HI 96766

Dear Chief Sproat:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. The potable system proposed for the Kapalawai Resort will provide fire protection, and are included as part of the overall infrastructure required. A well will be constructed off-site, about ¼ mile mauka of the project site. A storage tank will also be included as part of the project's water system. The volume of the storage tank will provide the maximum day rate plus fire flow for the duration of the fire with the reservoir ½ full at the start, and with credit for well inflow. Based on RR-10 zoning, fire flow requirement is 1500 gpm for two hours. This translates to a storage requirement of 172,550 gallons. A 0.20 million gallon storage tank is proposed. This information will be included in Appendix J of the DEIS.

We appreciate all your comments concerning appropriate design considerations, landscaping requirements, and building setbacks. All of these concerns will be incorporated into detailed plans for the project.

2. We recognize the need to provide adequate fire vehicle access throughout the property. These facilities, as well as fire hydrants, will be incorporated into more detailed planning for the project.
3. Several letter writers pointed out the need to have an emergency communication system installed in the cottages. We note this comment

Helber Haster & Fee
Greenroom Center, Malua Tower

733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2650

Helber Haster
Planners

Chief Sproat
November 5, 1999

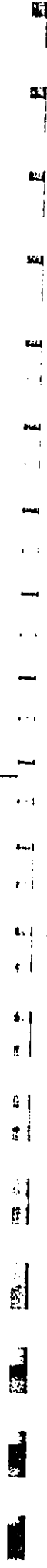
and pledge to provide an adequate warning system for employees, guests and others on the property.

If you have any questions regarding this project, please call me at 545-2055.
Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC



ESTHER UEDA
EXECUTIVE OFFICER



STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

August 3, 1999

Mr. Keith Mitta
Planning Department
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Mitta:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
for Kapalawai Resort, Kapalawai, Kauai, Hawaii

We have reviewed the EISPN for the subject project and have the following comments:

- 1) We confirm that the project site, as represented on Figure 13, is designated within the State Land Use Agricultural and Conservation Districts. We note that the figure incorrectly refers to the Agricultural District as the "Agriculture" District. As noted on the figure, our office is currently processing a boundary interpretation to delineate the location of the district boundary relative to the project site.
- 2) We acknowledge that a boundary amendment petition for the subject project will be filed with our office in the future. Clarification should be provided regarding the specific area that will be the subject of the petition.
- 3) We request that a copy of the Draft Environmental Impact Statement be forwarded to our office for review and comment as soon as it becomes available.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject EISPN.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EUM:th

cc: DEQC
Lewis Geyser
Scott Ezer

Helber Haster
Planners

November 5, 1999

Ms. Esther Ueda, Executive Officer
State of Hawaii
Department of Business, Economic Development & Tourism
Land Use Commission
P.O. Box 2359
Honolulu, HI 96804-2359

Dear Ms. Ueda:

Environmental Impact Statement Preparation Notice
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated August 3, 1999 on the above environmental impact statement preparation notice (EISPN). Your letter will be included in the draft environmental impact statement (DEIS) being prepared.

We note that you have confirmed the project site is within the State Land Use Agricultural and Conservation Districts. The graphic representation of these districts in the DEIS (Figure 6) will include correct designations. We also acknowledge receipt of your boundary interpretation (dated July 28, 1999). We are in the process of certifying a shoreline survey for the property, and will notify your office after certification is complete.

Completion of the shoreline survey certification will also allow determination of the specific area that will be the subject of our future State Land Use Boundary Amendment.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

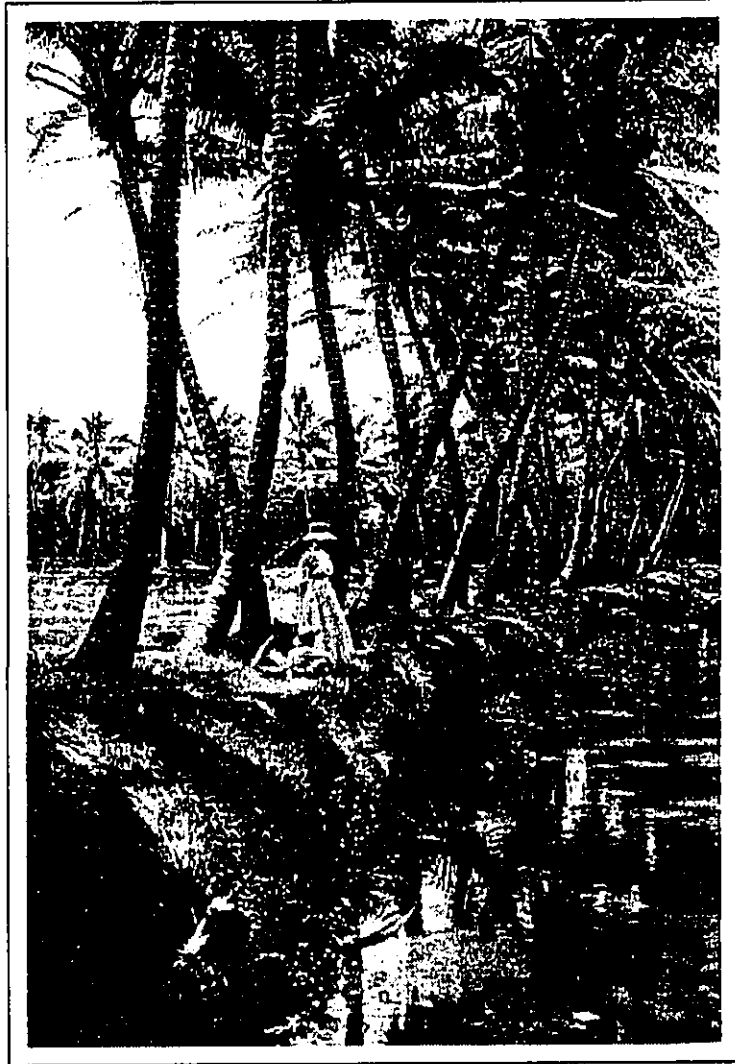
HELBER HASTER & FEE, Planners

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Haster & Fee
Greener Center, Mahai Tower
Honolulu, Hawaii 96813

Telephone 808 545-2055
Facsimile 808 545-2050



13

PARTIES CONSULTED
DURING THE PREPARATION
OF THE
FINAL ENVIRONMENTAL
IMPACT STATEMENT

13.0 PARTIES CONSULTED DURING THE PREPARATION OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT

Notice of the availability of the DEIS prepared for this project appeared in the *Environmental Notice* on November 23, 1999, commencing a 45-day public comment period which ended on January 7, 2000. A copy of the draft environmental impact statement was mailed to the agencies and organizations listed below.

A total of 25 agencies, organizations, or individuals provided written comments on the DEIS. The parties who responded to the DEIS are identified by an asterisk (*) and their respective comments are reproduced in the following pages, along with response letters to the comments. Parties identified by a double asterisk (**) were not on the original mailing list but sent in comments or requested to be considered a consulted party.

Elected Representatives

The Honorable Avery B. Chumbley, Hawaii State Senator District 6
 The Honorable Jonathan Chun, Hawaii State Senator, District 7
 The Honorable Hermina Morita, Hawaii State Representative, District 12
 The Honorable Ezra Kanoho, Hawaii State Representative, District 13
 The Honorable Bertha Kawakami, Hawaii State Representative, District 14
 The Honorable Maryanne W. Kusaka, Mayor, County of Kauai
 The Honorable Ronald Kouchi, Chair, Kauai County Council
 The Honorable Bryan J. Baptiste Kauai County Council
 The Honorable Gary Hooser, Kauai County Council
 The Honorable Daryl Kaneshiro, Kauai County Council
 The Honorable William Swain, Kauai County Council
 The Honorable James Kunane Tokioka, Kauai County Council
 The Honorable Randal Valenciano, Kauai County Council

Federal Agencies

Department of Agriculture, Soil Conservation Service
 Department of Defense
 Department of the Army, Army Corps of Engineers
 Department of the Navy, Pacific Missile Range Facility, Barking Sands* ✓
 Department of the Interior
 Fish and Wildlife Service*
 Geological Survey
 Department of Commerce
 National Marine Fisheries Service

State Agencies

Department of Accounting and General Services* ✓ φ
 Department of Agriculture
 Department of Business, Economic Development, and Tourism
 Land Use Commission* ✓

Librarian, DBEDT Library
Office of Planning* ✓
State Energy Office
Department of Defense
Department of Education
 Superintendent*
 Hawaii State Library
 Hanapepe Public Library
 Waimea Public Library
 Koloa Library
 Kapaa Library
 Princeville Library
 Lihue Regional Library
 Hawaii Kai Regional Library
 Kaimuki Regional Library
 Hilo Regional Library
 Kaneohe Regional Library
 Kahului Regional Library
 Pearl City Regional Library
Department of Hawaiian Home Lands
Department of Health
 Office of Environmental Quality Control* ✓
Department of Land and Natural Resources
 Historic Preservation Division*
Department of Transportation*
Office of Hawaiian Affairs* ✓ ⊕
Legislative Reference Bureau
University of Hawaii
 Environmental Center*
 Hamilton Library
 Water Resource Research Center

County of Kauai Agencies

Office of the County Attorney
Fire Department*
Department of Planning*
 Chair, Planning Commission
 Historic Preservation Review Commission
Police Department
Department of Public Works* ✓
Department of Water* ✓
Civil Defense Agency*
Office of Economic Development* ✓
 County Energy Coordinator* ✓

Public Utilities

GTE Hawaiian Tel
Kauai Electric Company

Community Organizations/Individuals

Amfac Sugar Company
Hanapepe Business Association
Hanapepe Bay Association
Hanapepe Professional Businessmen's Association
Hanapepe Economic Alliance, Inc.
ILWU (Kauai Division)
Judy Naumu Stewart
Kauai Chamber of Commerce
Kauai Economic Development Board
Kauai Visitors Bureau
Kikiaola Land Co., Ltd.
Life of the Land* ✓
Sierra Club, Hawaii Chapter* ✓
Kauai Group of the Hawaii Chapter**
West Kauai Development Corporation
West Kauai Main Street
Dorothea Hayashi
Arius Hopman** ✓
Richard Knobel** ✓
Warren Scoville** ✓
James Powell**

Newspapers

The Garden Island Newspaper
Kauai Business Report
Honolulu Advertiser
Honolulu Star-Bulletin



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

OFFICE OF PLANNING

235 South Beretania Street, 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

BENJAMIN J. CAVETANO
COMMISSIONER
SEMI F. NAKA
DEPUTY COMMISSIONER
BRADLEY J. MOSESALAN
DEPUTY DIRECTOR
DAVID W. BLANE
DIRECTOR, OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2842

Mr. Dee Crowell
Page 2
December 29, 1999

Should you have any questions, please call the Land Use Division at 587-2842.

Ref. No. P-8410

December 29, 1999

Mr. Dee Crowell
Planning Director
Planning Department
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement (DEIS)
Kapalawai Resort, Waimea, Island of Kauai
TMK: (4) 1-7-05: 01

We have reviewed the subject DEIS and offer the following comments for your consideration.

It is our understanding that the proposed Kapalawai Resort, containing 250 visitor cottages dispersed throughout the 170-acre site, will target "ecotourism" or "nature-based tourism". Based on an occupancy of 1.95 people per unit, and an average overall occupancy rate of 75 percent after three years, the DEIS estimates an average of about 365 visitors per day by 2004. In addition, about 143 operational employees would be present on an average day. During the year of construction, there could be about 240 construction workers on-site on any given day.

Given these numbers, it is our recommendation that other proposed developments at Waimea/Kekaha be included in the discussions to update the Waimea-Kekaha Regional Development Plans prepared for the County of Kauai in 1977. The land use designations for the project site at that time were Agriculture and Open Space. The significance of the Koloa-Poipu resort area should also be discussed in relation to the proposed resort at Kapalawai.

Thank you for the opportunity to comment.

Sincerely,

David W. Blane
Director
Office of Planning

cc: Seiji F. Naya
Ms. Esther Ueda, LUC
Office of Environmental Quality Control
Destination Villages Kauai, LLC
Heiber Hastert & Fee

Helber Hastert
Planners

March 9, 2000

Mr. David W. Blane, Director
Office of Planning
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Blane:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter of December 29, 1999 on the above draft environmental impact statement preparation notice (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.


Comments in your letter suggest that other proposed developments in Waimea/Kekaha, and the significance of Koloa-Poipu resort area should be included in the discussions to update the Waimea-Kekaha Regional Development Plan. As explained in the DEIS, the County of Kauai is now in the process of updating the General Plan, not the Waimea-Kekaha Regional Development Plan. The General Plan update involves the entire island, including Waimea/Kekaha and Poipu. In early December, draft recommendations for the General Plan update were released, including a change in the designation for the Kapalawai property to "Resort."

The review of these recommendations, and the entire General Plan update, by the County Planning Commission and County Council, will take place later this year.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Dee Crowell, Director
Lewis Geyser, Director
Destination Villages Kauai, LLC

MARYANNE W. KUSAKA
MAYOR



PLANNING DEPARTMENT

January 3, 2000

Scott Ezer
Helber Hastert & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

SUBJECT: Kapalawai Resort Draft Environmental Impact Statement (DEIS)
Kapalawai, Kauai, Hawaii

We have the following comments to offer regarding the DEIS:

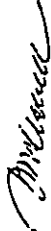
- Please be aware that this project will be subject to the review and recommendations of the Kauai Historic Preservation Review Commission (KHPRC). We recommend that our office be contacted to obtain more information concerning this matter. Rick Tsuchiya is the contact person for the Planning Department on this matter.
- A list of native plants which will be used to landscape the project should be included in the information provided at the Public Hearings with the Planning Commission.
- Will the water system remain private?
- Likewise, will the sewer system remain private?
- Because the property is currently restricted to the public for general access (with the exception of the shoreline access adjacent to the existing stream), it is important that public access be allowed within the project. It is recognized that public access throughout the entire project presents concerns about security and vandalism. However, there should be provision for access within the project site. It would be prudent to have an access plan available since this matter will be come up throughout the process of obtaining entitlements and permits.
- We note that a beach access/public facilities plan has yet to be developed. Our concern is that the burden of developing such a plan not be placed on the County. The developer should have a proposal prior to Planning Commission action on the General Plan amendment. This matter could be incorporated into the access plan.

Kapule Building • 4444 Rice Street, Suite 473 • Lihue, Kauai, Hawaii 96766
AN EQUAL OPPORTUNITY EMPLOYER

Mr. Scott Ezzer
Page 2 of 2
January 3, 2000

- According to the proposal, 170 acres of Agricultural (State Land Use District) lands are proposed to be redistricted into the Urban State Land Use District to accommodate 250 visitor units which amounts to approximately 1.5 units per acre in comparison to the standard 20 to 40 visitor units per acre. This vast amount of acreage to accommodate 250 units is of concern since an Urban District designation will allow for other types of zoning permitted within the Urban District to occur within the 170 acres. Therefore, it is extremely important that controls be incorporated to ensure that the other Urban uses beyond the hotel use not occur prematurely.
- As a matter of information, our office is in the process of updating our current General Plan. At this point it appears that the General Plan Update (GPU) project will run concurrently with this application. There may be overlap, and as a result the timing aspects of this application with our GPU project should be discussed further.
- Should the outcome of the General Plan Amendment and State Land Use District Boundary Amendment process be favorable, an updated project completion schedule along with an updated economic impact analysis should be submitted at the time of Zoning Amendment.
- Please be aware that the Kikiaola Land Co., Ltd. is also applying for a General Plan change to their maui lands. Because there are now two large scale projects being proposed on the west side which has experienced very little growth in comparison with the rest of the island throughout the years, we will have to evaluate both applications on a concurrent basis.
- Buildings should be setback from the shoreline due to hazard mitigation and visual impact concerns. The extent of the building setback should be addressed at the time of Zoning Amendment.

Thank you for the opportunity to comment, and should you have any questions, please feel free to contact Keith Niina of my staff at 241-6677.


DEE M. CROWELL
Planning Director

Heller Hinkert
Planners

March 9, 2000

Mr. Dee M. Crowell, Director
County of Kauai
Planning Department
4444 Rice Street, Suite 473
Lihue, HI 96766

Dear Mr. Crowell:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 3, 2000 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared. For your ease of reference, we will respond to your comments in the order they appear in your letter.

Kauai Historic Review Commission (KHPRC). We recognize that KHPRC will review the proposed project. In fact, representatives of the applicant appeared at a recent meeting of the KHPRC (January 6, 2000) to discuss the Kapalawai Resort. Future meetings with KHPRC, including a site inspection, are contemplated as the permit processing continues.

Native Plants. Specific native species to be used in the landscaping for the Kapalawai Resort will not be identified until landscape plans are prepared at a later date. However, we will be prepared with a list of potential species appropriate for use at Kapalawai.

Water/Wastewater Systems. All aspects of these utility systems will remain private.

Public Access Plan. We acknowledge the need to develop a clear plan identifying public access through the property to the shoreline, and within the property to the fishpond. We also understand that public facilities should also be identified. We will be discussing these issues within the West Kauai community in the next few months, and will have a plan available for discussion during public hearings on the applicable General Plan Amendment and Zoning Amendment.



Helber Haster & Fee, Planners

Mr. Dee Crowell
March 9, 2000
Page 2

Control of Urban Uses. We share your concern about the potential for expanded use of Urban-designated portions of the project site. We wish to make it clear that the scale of the proposed resort is the limit of development sought by the applicant.

General Plan Update. We note that the County of Kauai is in the process of updating the General Plan and that public discussion and hearings on the update may overlap with the petition for a General Plan Amendment filed by Destination Villages, LLC for the Kapalawai Resort. We pledge our commitment to continued discussions with the Planning Department during the review of these two matters.

Project Schedule/Economic Impact Analysis Update. If petitions for a General Plan Amendment and State Land Use District Boundary Amendment are favorable, we shall submit updates to the project schedule and economic impact analysis.

Kikiaola Land Company. We are aware that Kikiaola Land Company has also submitted a petition for a General Plan Amendment, and that both applications will be evaluated concurrently.

Shoreline Building Setback. We agree that it is most appropriate to determine building setbacks due to hazard mitigation and visual impact concerns at the time of Zoning Amendment.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners



Scott Ezer
Senior Associate

cc: Lewis Geyser, Destination Villages Kauai, LLC



LIFE OF THE LAND

Ma Mau Ke Ea O Ka Aha I Ka Poo
Hawaii's own local Community Action Group
Protecting our Fragile Natural & Cultural Resources
through Research, Education, Advocacy & Litigation

January 5, 2000

Scott Ezer
Helber Haster & Fee, Planners
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Keith Niha
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

re: Kapalawai Resort Draft Environmental Impact Statement

We can not understand why the developer will not discuss the ramifications of proposing to build resorts on agricultural lands on two different islands. The state constitution, which covers the entire state, promotes the preservation of agricultural lands. Kapalawai and Puuena are both planned resorts on non-resort zoned lands.

Zoning Laws are designed to bring about an orderly, well-defined change. Planning allows for adequate development of infrastructure. The alternative is spot zoning where developers build whatever they want wherever they want.

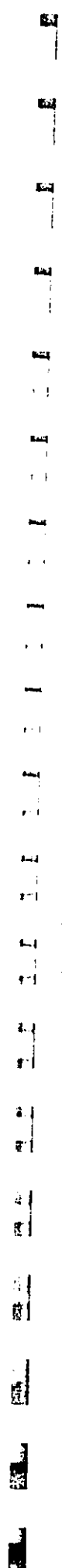
The Kauai 2020 Vision Plan (CAC Draft 3: 1/27/99) states:

"Land use regulations specifically provide for rural residential communities, with design standards to preserve open space and landscape features. Regulations and tax incentives are structured to promote legitimate agriculture enterprises and to increase opportunities for small farmers. ... We support our farm entrepreneurs in helping to keep Kauai green. Large- and small-scale agriculture and aquaculture operations occupy substantial tracts of prime agricultural land throughout the island. Forest plantations are maturing on large and smaller tracts of land. County land use regulations and property tax incentives promote active agricultural and forestry use of agricultural lands."

Comprehensive planning and sound reasoning should be used to develop General Plans, Regional Plans, and Development Plans. Comprehensive planning forces the municipality to focus on sound planning reasons when it makes its decision. As the Hawaii Supreme Court has noted: "Zoning ordinances are in derogation of the common law, and their provisions must be strictly construed."

"The current (Kauai) General Plan designations for the project site are Open and Agriculture" (EISPN page 36)
"The land use map of the Waimanalo Regional Development Plan was intended to establish a 10 to 15 year policy on moderate growth and development of the region. Land use designations for the project site were identified as Agriculture and Open Space." (EISPN page 38)
"The Comprehensive Zoning Ordinance for the County of Kauai (CZO) define the allowable uses of land within Kauai County. ... the project site is a mix of "Open," and "Agriculture" zoning. Resort uses are not permitted in either the Open or Agriculture zoning districts." (EISPN page 39)
"Approximately 80 percent of the property lies within the SMA" (EISPN page 39)

• 76 North King Street • Suite 203 • Honolulu, Hawaii 96817 • phone: 533-3454 • fax: 533-0993 •
• email: liffeoftheland@hotmail.com •



Heller District
Planning

March 9, 2000

Mr. Henry Curtis, Executive Director
Life of the Land
76 North King Street
Honolulu, HI 96813



Dear Mr. Curtis:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 5, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

We note your reference to the Constitution of the State of Hawaii, and its requirement to preserve agricultural lands. Article XI, Section 3, of the State Constitution includes the pertinent language in regard to agricultural land. While you correctly assert that preservation of agricultural land is important, you fail to apply the conditions under which land should be deemed to be worth preservation. The State Constitution also requires the Legislature to develop standards and criteria to determine which lands should be deemed important. As you are aware, since the adoption of this language in 1978, no such standards and criteria have been developed.

Further, agricultural preservation is actually one of the primary reasons the Robinson Family decided to seek resort use of the Kapalawai property. It is significant to note that this property has been one of the primary residences for the family since the latter part of the 19th century, and has never been included in the lands used for agricultural production. The instability in sugar markets has caused the Family to consider other sources of income to offset this instability, thereby supporting continued agricultural use elsewhere in the region.

In addition, the dual purpose of preservation of the historic resources on the property is accomplished. Without development of the property, which includes the integration of historic resources into site planning, valuable cultural assets will suffer from lack of attention and maintenance.

You also contend that the proposed project is not based in sound planning principles, and somehow violates zoning laws. In our earlier letter to you (November 5, 1999), we said that land use approvals for the resort will include a State Land Use District Boundary Amendment, a County of Kauai General Plan Amendment and Zoning Amendment, in addition to a Special Management Area Use Permit, among

H. Curtis, Executive Director
Life of the Land
76 North King Street
Honolulu, Hawaii 96813

"Agriculture is keeping Kauai green and economically healthy through a variety of crops and products from both large corporate and small farms. Aquaculture is also a strong and growing industry contributing to local markets and exports. ... The market for organically-grown crops is increasing. ... Kauai now produces 30 percent of its own food, reducing food imports and keeping more money in the community. ... Small farmers on Kauai are thriving and profitable. ... Kauai's larger corporate agriculture and aquaculture businesses are volume exporters for niche markets. ... Their ability to weather varying market conditions lends stability to the Kauai economy. ... State and county government support diversified agriculture by offering tax incentives; maintaining the agricultural irrigation and road infrastructure on State-owned lands; and managing affordable agricultural parks." The Kauai 2020 Vision Plan (CAC Draft 3: 1/27/99)

"Noted for its low-key development, dry and sunny climate, and laid-back lifestyle, the West Side offers surprising diversity. It includes small-town communities; vast agricultural lands; the unique resources of Waimea Canyon, Kokee and other mauka wilderness areas; and the high-technology Pacific Missile Range Facility. ... Agricultural lands have been preserved from sprawling subdivisions." Vision for the West Side Planning District (Draft 199)

The Kapalawai project has far more restrictive zoning than the Puaena project. Both projects test the same principle. Can a developer propose a project which directly violates zoning laws that were just enacted or are in the process of being enacted. The Kapalawai project goes one step further: can the developer propose to look only at alternatives which violate the current zoning for the property? These are heavy issues. The DEIS MUST look at the CUMULATIVE IMPACT of proposing a series of eco-camps that propose altering the way agricultural lands are used. Agricultural lands are protected by the State Constitution. This must be part of the analysis.

1. How are the projects in line with court rulings, Land Use Commission rulings, and Administrative rulings?

The land is zoned agricultural. Why were only four Resort alternatives looked at? If, of the Land would like to see fully developed alternatives reviewed. These alternatives should include ALL less intense uses for the land such as: (1) AG-2 Agricultural Lot Subdivision; (2) Livestock Options; (3) Diversified Agricultural Operations; (4) Agricultural Service Center; (5) Historical Site; and (6) Rural/Residential.

"Elements of a healthy economy: Preservation of our special environment and culture; Expanding and building local markets and reducing imports, resulting in more money remaining in the local economy; More jobs, with higher wages reflecting a variety of profitable businesses seeking qualified employees; A strong education system which prepares Kauai's children, teens, college students and adults to work in the diversified economy." The Kauai 2020 Vision Plan (CAC Draft 3: 1/27/99)

How can the public pass meaningful zoning laws if anyone can easily overturn them?

Please explain the non-conformance of the project with each section of the General Plan, Regional Plan and CZO.

Will Kapalawai Resort help diversify the economy? How? Please be specific.
Will the county economy be more or less diversified if your project is approved? How?

Mahalo.

Henry Curtis
Executive Director

Helber Haster
Planners

Mr. Henry Curtis
March 9, 2000
Page 2

others. All procedures and land use requirements will be strictly adhered to, including the provision for public hearings before State and County agencies and bodies with jurisdiction over land use matters. Adherence to these requirements reinforces accepted land use laws, rather than ignoring them.


To support your claim that the proposed resort contravenes current planning efforts underway to update the County of Kauai General Plan, you liberally excerpt language from the *Kauai 2020 Vision Plan*. One section of this plan also deals with the visitor industry. This section of the plan specifically suggests that additional visitor units, residential in style, are intended to be developed in West Kauai. In addition, the current draft General Plan Update report contains recommendations to designate the Kapalawai site "Resort."

The development of the Kapalawai Resort will diversify the economy of West Kauai, and the entire island. In the case of West Kauai, the only visitor units (a total of 50) presently in the region are found at the Waimea Plantation Cottages property. The addition of visitor units at Kapalawai will broaden the presence of the visitor industry in West Kauai, thus diversifying its economy. In addition, the style of development, and the emphasis on the historic features of the property will appeal to visitors who might not otherwise choose to travel to Kauai. The visitor market is not homogeneous, and is actually made up of many different markets. The Kapalawai Resort will help to broaden the diversity of product type found on Kauai, thus diversifying the overall appeal of the Kauai market.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

HELMUTH CRUTCHFIELD
GOVERNMENT OF HAWAII



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

January 7, 2000

99-166A/epo

BRUCE S. ANDERSON, Ph.D., MPH
DIRECTOR OF HEALTH

In reply, please refer to
File #

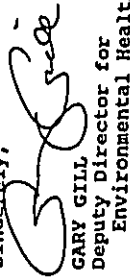
Mr. Keith Nitta
Department of Planning
County of Kauai
Kapule Building
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Nitta:

Subject: Draft Environmental Impact Statement (DEIS)
Kapalawai Resort
Kapalawai, Waimea District, Kauai
THK: 1-7-05: 1

Thank you for allowing us to review and comment on the subject document. We do not have comments to offer at this time.

Sincerely,


GARY GILL
Deputy Director for
Environmental Health

cc: Destination Villages Kauai, LLC
Helber Haster & Fee, Planners
KDHO

Helber Hastert
Planners

March 9, 2000

Mr. Gary Gill
Deputy Director for Environmental Health
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, HI 96801

Dear Mr. Gill:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 7, 2000 on the above draft environmental impact statement preparation notice (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We note that you have no comments on the DEIS to offer at this time.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber HASTERT & FEE, Planners
1000 South Street, Suite 1000
Honolulu, Hawaii 96813



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecognition
300 Ala Moana Boulevard, Room 3122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: LLLW

JAN 11 2000

Mr. Keith Nitia
County of Kauai
Department of Planning
4444 Rice St. Suite 473
Lihue, HI 96766

Re: Draft Environmental Impact Statement for the Kapalawai Resort, Kauai, Hawaii

Dear Mr. Nitia:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced October 1999 Draft Environmental Impact Statement (DEIS), which was received in our office on November 23, 1999. The project sponsor is Destination Villages Kauai, LLC. The Service offers the following comments for your consideration.

The proposed project involves the development of a 250-unit resort with accessory facilities including the restoration of several existing features. These features include a residence, a fishpond, and grounds that incorporate streams, springs, and beachfront.

In general, the Service believes that the DEIS adequately describes the proposed action and the primary fish and wildlife resources located at the proposed project site. The Service believes that among the alternatives considered in the DEIS, the preferred alternative is the action least likely to impact fish and wildlife resources. Potential impacts to fish and wildlife resources have been adequately addressed in the DEIS, and the mitigation that is proposed is adequate to minimize anticipated unavoidable impacts to fish and wildlife resources. The Service recommends that the Final Environmental Impact Statement (FEIS) confirm that each of the stated mitigation measures in the DEIS will be implemented as part of the project. We also recommend that each individual "best management practice" that will be implemented be identified in the FEIS as well.

Helber Haster
Planners

March 9, 2000

Mr. Paul Henson, Field Supervisor
Ecological Services
U.S. Department of the Interior
Fish and Wildlife Service
300 Ala Moana Blvd., Room 3122
Honolulu, HI 96850

Dear Mr. Henson:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 11, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

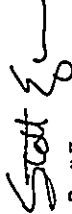
You suggest that the FEIS confirm that each of the stated mitigation measures will be implemented. A main purpose of the EIS process is to develop actions that can be implemented that will either eliminate or reduce anticipated impacts of project development. To this end, it is intended that these mitigation measures be implemented. Ordinarily, these mitigation measures are included in final approvals granted by approving agencies. We would support and encourage the mitigation measures discussed in the EIS to be adopted as conditions of approval by these approving agencies.

In regard to best management practices (BMPs), we cannot identify each such practice that will be implemented for Kapalawai at this time. We can however, identify a range of BMPs that could be implemented depending on final design.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

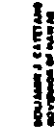
The Service appreciates the opportunity to provide comments on the DEIS. If you have questions regarding these comments, please do not hesitate to contact Fish and Wildlife Biologist Lorena Wada by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,



Paul Henson
Field Supervisor
Ecological Services

cc: USEPA - Region IX, Honolulu
NMFS-PIAO, Honolulu
DAR, Hawaii
DOFAW, Hawaii
CZMP, Hawaii
CWB, Hawaii
Destination Villages Kauai, LLC
Helber Haster & Fee, Planners



SCOTT E. GAYLER
DIRECTOR OF BUREAU



THOMAS E. JONES, CHAIRMAN
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF BUREAU OF LAND MANAGEMENT

SCOTT E. GAYLER
DIRECTOR OF BUREAU
LAND MANAGEMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
801 Kamehaha Building
Honolulu, Hawaii 96807

December 14, 1999

Mr. Keith Nitta
Planning Department
County of Kauai
4444 Rice Street, Suite 473
Lihou, Kauai, Hawaii 96766

Dear Mr. Nitta

SUBJECT: Chapter 6E-12, Historic Preservation Review -DEIS for
Kapalawai Resort
TMK: 1-7-05: 01
Waimea, Kauai

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
801 Kamehaha Building
Honolulu, Hawaii 96807

December 8, 1999

Mr. David Shideler
Cultural Surveys Hawaii
733 N. Kalaheo Avenue
Kailua, Hawaii 96734

Dear Mr. Shideler:

We have reviewed the archaeological inventory survey report for this project, and revisions are needed before it is acceptable. We have attached our review comments to this letter (99URNM14). We will let you know in writing once we receive an acceptable report.

At this time, historic sites are in the project area -- one inland fishpond apparently dating back to precontact times and rock walls, a clearing platform, the main Robinson house complex, and a Portuguese Oven all associated with late 1800s-early 1900s times. One of our concerns with the report is that it clarifies, more definitively, that subsurface precontact archaeological deposits are unlikely to be present. Apparently, they are not, but this needs to be clearer.

It appears that the important historic sites will be preserved, and some of these preserved sites will be restored. In concept, we agree with this mitigation commitment, although we cannot finalize our comments until we receive the revised report which is to clarify some concerns. For example, we think that one site (a late 1800s-early 1900s clearing mound) may not need preservation. At that time, we can recommend specific mitigation conditions to your agency to ensure that the development will have no adverse effect on significant historic sites.

Eventually, detailed mitigation plans for interpretation and restoration will need to be developed and be reviewed by our staff.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

NM:lm

ATTACHMENT 99urnm14.doc

c: Lewis Geyer, Destination Villages Kauai, LLC, 4439 Via Abriqada, Santa Barbara, CA 93110
Scott Ezer, Heiber, Hastert and Fee Planners, 733 Bishop Street, Suite 2590, Honolulu, HI 96813



SCOTT E. GAYLER
DIRECTOR OF BUREAU

THOMAS E. JONES, CHAIRMAN
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF BUREAU OF LAND MANAGEMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
801 Kamehaha Building
Honolulu, Hawaii 96807

December 8, 1999

Mr. David Shideler
Cultural Surveys Hawaii
733 N. Kalaheo Avenue
Kailua, Hawaii 96734

Dear Mr. Shideler:

SUBJECT: Historic Preservation Review -- Archaeological Inventory Survey
for the Proposed Kapalawai Resort-Kapalawai, Koloa, Kauai
TMK: 1-7-05: por.1

This letter reviews the survey report which you sent July 30, 1999 (Zulick et al 1999, Archaeological Inventory Survey Report for 170 Acres Including a 6-Acre Inland Fishpond Cultural Surveys Hawaii ms.).

We agree that the survey is likely to have found all historic sites, if your firm clarifies that subsurface testing is likely to have found any major subsurface archaeological deposits of precontact to early 1800s age that might have been present. Five historic sites were found. Most are associated with the late 1800s-early 1900s residence in the project area (e.g., 762-rock walls, 763-stone platform, 764-house complex, 766-Portuguese oven). One site (765-Kekupua Fishpond) seems to have been used back into precontact times.

The background section needs some minor correction, but it also needs two major additions (an analysis of Mahele era land use patterns and a summary of the ahupua'a settlement pattern and likely site pattern in the project area). Thus, this section needs some revision (see attachment). We request some minor clarification's on the descriptions and interpretations of the sites (see attachment). Also, we request a summary paragraph or two on general site patterns in the Conclusion (see attachment).

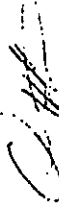
The significance evaluation section needs some revisions before it will be acceptable. Please see the attachment for specifics. Generally, we agree with the evaluations, but we request clarification on one or two sites.

The mitigation commitments also need clarification. Your firm seems to be recommending that all the sites be preserved, but this is not clear to us.

D. Shideler
2

Thus, the report needs some revisions and needs to be re-submitted for our review, before we can evaluate significance of the sites and mitigation proposals. However, the revisions are all relatively minor - predominantly being clarifications. As always if you disagree with our comments or have any questions, please contact our review staff right away. Nancy McMahon is our contact for this review (742-7033).

Aloha,



DON HIBBARD, Administrator
State Historic Preservation Division

NM:amk

c. Scott Elder
Dee Crowell, County of Kauai

D. Shideler
3

ATTACHMENT

**Needed Revisions to Archaeological Inventory Survey Report
Proposed Kapalawai Resort**

CSH

Historical Background -- Summarizing the Ahupua'a Settlement Pattern and Predicting the Likely Site Patterns in the Project Area

1. p. 10. It would be good to have a map clearly showing the ahupua'a borders, as this is a less commonly studied ahupua'a. Perhaps Figure 4 and 7 could have the borders shown as bold black lines.
2. p. 16, par. 3. There were 116 Mahele land claims (apparently), but you have not sampled these claims to indicate specific land use patterns at this time -- where the houses were, where the fields were, etc. This is a requirement of our minimal standards. It is important to document these patterns, because these are verified land use patterns present in 1840s and help supply a context for predicting archaeological sites that still might be present and for evaluating significance. Again, a sample would be sufficient.
3. p. 19 Here you indicate some history on the Kapalawai house. It would be good to mention if it has been recorded in the statewide inventory.
4. It was interesting reading the Robinson Family history. It appears oral interviews were conducted for one site. Where there other oral interviews conducted? This information should be clarified in the report. Are there still residents who lived where the workers houses are that could be interviewed? Were the Robinson and heirs interviewed? This clearly is a line for mitigation work, but you could address this. It could go in the background or in the methods section.
5. The Bennett map is included, and the sites presented in the report should be readable and presented on page 7 or 4.
6. Page 27. There is no summary of the ahupua'a settlement pattern at different points in time, nor of the sites likely to be present in the project area. This is required and needs to be added. You have compiled a fair amount of information and that (with the Mahele information to be added) should help you easily do this task. Clearly, you have a fishpond in the project area dating to 1840 times and earlier, but the general context for the ahupua'a and likely patterns in the project area must be clear. Similarly, you have some information on the late 1800s and the house construction, but you need the context briefly summarized for that period also.

D. Stideler
4

Methods (pp. 5-6)

1. What kind of oral history did you do? Are there still camp workers who could tell you about the rock walls and terraces in the camp area? Some background on oral history done and also possible is needed here to clarify what you did.
2. Why were controlled excavations not done to try to date the walls. Our staff did talk to you about this and you felt no information could be gathered. You need to state in the methods section how and why you choose your test excavation locations..

Findings -- Site Descriptions, Functions, Age & Conclusions

1. Site 763.
 - a. p. 31. Feature F. You need to include an evaluation of function and age.
 - b. you need to include an evaluation of age of this site with the site discussion.
2. Site 763. Why the conclusion that the function is not clear. Your oral history seems to be quite clear what this site was. Your testing showed nothing to the contrary, correct. Please re-evaluate your conclusion. If you wish to stay with your conclusion fine, but reconsider.
3. Site 764.
 - a. It seems clear that an architect or architectural historian needs to document this site area. You recommend it for mitigation and recommend preservation, so that is acceptable. In the future, when finding such sites, they should be documented by professionals with expertise in that area.
 - b. What about the workers area? There is no description apparently of this area. Please include.
 - c. Technically, many of the walls seem to really be a part of this site. You could collapse them into this site if you wish, or you can leave them as is.
4. Site 766. Where was the Rita's house in relation to the oven, specifically? Also, approximately when was it built. Please include.
5. Summary, pp. 53 area. Somewhere here you need to summarize what precontact to early 1800s sites were found and how this compares to expectations, and you need to summarize late 1800s-1900s sites that were found and how this compares to expectations. The fishpond fits the former, and no housing deposits were present. (Do you feel confident enough with your testing to concluding no major subsurface housing deposits?) For the late 1800s-1900s, you have the house and workers houses and Rita's house and oven beyond, and clearing piles and boundary walls -- probably more details than expected.
6. The iron try pot is listed in appendix but not mentioned in the report.

D. Stideler
5

Significance Evaluations

Please separate your Significance Evaluations and your Mitigation Recommendations into two sections. This is a request that we repeatedly make. Please do separate them always in the future. These are two separate steps in the historic preservation process.

1. p. 55, Significance. Please provide a significance table, following common practice. You can show proposed mitigation on it too.
2. The iron try pot. Is it considered significant?

Mitigation Recommendations

1. The iron try pot. What is the proposed mitigation?
2. If Site 763 is simply a late 1800s-early 1900s clearing mound (as oral history indicates), why preserve it? Please clarify.
3. Site 762. You cannot make a vague recommendation like "Preserve to the extent possible". Are you recommending it (or some features of it) be preserved, and why?
4. Site 764. Are you (as your client's representative) recommending that all features of this site be preserved? Be clear.
5. Site 765. You say the "fishpond is expected to be cleaned and revived". We need more than an expectation. Is the commitment to preserve the fishpond?

CULTURAL SURVEYS HAWAII

Archaeological Studies
Hallett H. Hammit, Ph.D.
733 N. Kalanooa Avenue
Kaliua, Hawaii 96734
FAX: (808) 262-4950, Bus: 262-9972
e-mail: csh@cpa.net

COVER SHEET FOR TRANSMITTAL

TO: Ms. Nancy McMahon
State Historic Preservation Division, Kauai Office
5532 Tapa Street
Koloa, Kauai 96756

PROJECT: Archaeological Inventory Survey Report for 170 Acres
Including a 6-Acre Inland Fish Pond for the Proposed Kapahwai
Resort, Kapahwai, Kauai, Hawaii (TMK 1-7-05:por. 1)

DATE/TIME SENT: February 10, 2000

FROM: Matt McDermott

REMARK: Thank you for your review letter of December 8th, 1999, addressed to David Shideler (Log no: 24087 Doc no: 9908NM14) of an earlier version of this report (July 1999). Here is a draft copy of the revised report. All comments from your December 8th, 1999 review letter have been addressed and the report has been substantially augmented and reworked. Attached is an item by item list of the revisions and additions that were made. Also please note that 2 radiocarbon samples from Site 50-30-09-792 (newly discovered traditional Hawaiian cultural layer) have been sent off to Beta Analytic, Inc., for analysis. The results should arrive any day and you will be sent the information as it is available. The ¹⁴C dating results are not expected to affect the site description, significance, or recommendations, however. The dating results will be discussed and presented graphically in Appendix 6. Please contact me if you have any questions.

Sincerely,



Matt McDermott.

McMahon letter February 10th, 2000

Page 2

The revisions you requested in your Dec. 8th, 1999, review letter, addressed to David Shideler (Log no: 24087 Doc no: 9908NM14) are discussed here by the item numbers you gave them in your letter. Please refer to a copy of that letter for the following discussion.

Under Historic Background you had 6 items.

Regarding item 1, we have included a Tax Map Key map showing the boundaries of the ahupua'a of Makaweli--this is Figure 6 in the revised report.

Regarding item 2, Section III, F., 1., beginning on page 18 of the revised report, was added to address the Mahele land claims.

Regarding item 3, this information about the Kapalawai House was added to the section on the Sinclair-Robinson-Gay Legacy on page 25, paragraph 4.

Regarding item 4, the information you requested regarding the oral interviews was added to the oral interview Methods section, on pages 10 and 11 of the revised report.

Regarding item 5, it is true the map from Bennett is almost illegible. This Figure (#7) could not be improved upon and was left "as is" (page 30 in revised report). However, the information from Bennett that pertains to the project area, including the site numbers and their locations, was plotted on Figure 8 (page 34 of revised report), the previous archaeology figure.

Regarding item 6, summaries of settlement patterns at various points in time have been added to the Historic Background section, see sections III. F. 1. and III. K. 1 (pages 18 and 27, respectively, of the revised report).

You had two items under the Methods section.

Regarding item 1, this information was added to the oral histories methods section, on pages 10 and 11 of the revised report.

Regarding item 2, in the methods section for the hand excavated trenches (page 9 in the revised report), there is discussion why excavations were not conducted in the project area walls.

You had 6 items under the Findings--Site Descriptions, Functions, Age & Conclusions

Regarding items 1 and 2, the site description for site 763 includes added discussion of site function and age (see pages 38-41 in the revised report). The conclusions regarding site function are still inconclusive, however.

Regarding items 3a, 3b, and 3c for site -764:

3a--Mason Architects, Inc. are documenting and evaluating this site.

3b--a brief description of Features G-N of Site -764 is included on page -764. Based on SHPD's request for better documentation of these workers cottages, Mason Architects, Inc. is documenting and evaluation these features.

3c--The walls were left with their original site/feature designations:

Regarding item 4, the information about Rita's house in relation to the oven and its construction date were added to the -766 site description (see page 46 of the revised report).

Regarding item 5, the summary section has been augmented to include your suggestions (see pages 117-119 of the revised report). The subsurface testing summary (page 116 of the revised report) also includes discussion of results in relation to expectations.

Regarding item 6, the iron try pot has been designated Feature G of site 50-30-09-762. The feature description, significance evaluation, and mitigation recommendations for this feature are included in their perspective sections of the report.

You had 2 items under Significance Evaluations:

Regarding item 1, a significance table was prepared (page 120 of the revised report). A separate mitigation recommendations table was prepared (page 123 of the revised report).

Regarding item 2, the iron try-pot has been designated Feature G of site 50-30-09-762. The feature description, significance evaluation, and mitigation recommendations for this feature are included in their perspective sections of the report.

You had 5 items under Mitigation Recommendations:

Regarding item 1, the iron try-pot has been designated Feature G of site 50-30-09-762. The feature description, significance evaluation, and mitigation recommendations for this feature are included in their perspective sections of the report.

Regarding item 2, our recommendation to preserve site -763 has been clarified (see page 124 of the revised report).

Regarding item 3, the wording of the recommendations for site -762 has been changed. The site is not recommended for preservation, with the exception of iron try-pot (Feature G). The information content of these features has been adequately recorded with inventory survey documentation. However, to maintain the ambiance of the historic parcel, the project developers are urged to incorporate the features of this site into their project

designs. The iron try-pot is recommended for preservation (see pages 123 and 124 of the revised report).

Regarding item 4, the recommendations for site -764 are based on the work of Mason Architects, Inc. The recommendations for these features are listed in the mitigation table (page 123 of the revised report) and briefly discussed on page 124 of the revised report.

Regarding item 5, the landowner is committed to the preservation, cleaning and restoration of Kekupua Fishpond. See discussion at the top of page 125 of the revised report.

Subsurface Testing Results

The documentation and analysis of 23 backhoe test excavations are present in this revised report. This work was done in late January of 2000. Appropriate Methods, Summary, and Site Descriptions, Significance evaluations, and Mitigation Recommendation sections have been added to this revised report. One additional state site number was assigned to the project area based on backhoe testing findings. Site -792 consists of a traditional-Hawaiian cultural layer and a most likely prehistoric/early historic Native-Hawaiian burial. Two charcoal samples from features of site for radiocarbon dating analysis. These results are still not in.



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kalahele Building, Room 555
501 Kamehaha Boulevard
Honolulu, Hawaii 96817

THOMAS E. JONES, CHAIRMAN
BOARD OF HISTORIC PRESERVATION
COMMISSION ON THE HISTORIC MONUMENTS

DIVISION
OF
LAND
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AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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CONTRACTS
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
STATE RESOURCE MANAGEMENT

January 26, 2000

Mr. Scott Ezer
Helber, Hastert and Fee Planners
723 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

LOG NO: 24650 ✓
DOC NO: 9912HM01

Dear Mr. Ezer:

Subject: Comments on the Hawaiian Traditional Customs and Practices Study and Sections of the Draft Environmental Impact Statement, Kapalawai Resort
TMK: 1-7-05: 1, Makaweli, Waimea, Kauai

Thank you for submitting for our review the study entitled *Hawaiian Traditional Customs and Practices, Study for Kapalawai, Ahupua'a of Makaweli, District of Kona, Kaa'i* (McGuire, Pyle, Shideler and Hammatt, July 1999). In considering this report we have also reviewed sections of the Draft Environmental Impact Statement for the Kapalawai Resort (October 1999) and the archaeological inventory survey report (Zulick et al., July 1999) conducted for the project. The following comments were prepared by the History and Culture Branch of the Historic Preservation Division and may, to some degree, overlap with other comments submitted by our office. You have already received comments from our Architecture Branch (Ltr. Hibbard to Slocumb, October 6, 1999) and from the Archaeology Branch (Ltrs. Hibbard to Shideler, December 8, 1999; Hibbard to Mitta, Dec. 14, 1999). This letter contains our major comments while more detailed comments on specific sections of these documents are included in Attachment 1.

Before discussing the cultural impact assessment, we need to point out that the Historic Preservation Division only has the authority to comment on those customs and practices which are associated with features or specific places that can be considered historic properties as defined in Chapter 6E (HRS) or those practices which could adversely affect identified historic properties. We do not have the authority to evaluate a report or a report's findings if they only address Hawaiian customs, gathering rights, and access issues.

In the case of the Kapalawai assessment, there are three general areas of concern in which we feel we can comment because they, potentially, have a direct bearing on the historic preservation compliance process. The first is the methodology used to identify and interview individuals potentially knowledgeable of past and current Hawaiian customs and practices in the project area. The general methods used to identify traditional customs and

practices are essentially the same as those used to identify historic properties which are significant because of their association with customs, beliefs, and traditions (i.e., those often call traditional cultural properties). The second is assessing whether any features or places identified during the assessment qualify as historic properties and if there is sufficient information to evaluate the significance of these properties. Third, these interviews can be a valuable source of information for describing the recent history of the project area and in developing interpretive themes for individual historic properties or the project area as a whole.

Within our areas of concern, we believe some sections of the cultural assessment need to be revised and expanded and that this could be accomplished in two ways. In general the methods and approaches used during the study appear to represent a good faith effort to identify potentially knowledgeable individuals and to ask the kinds of questions that would elicit information about historic properties and topics applicable to the historic preservation process. We need, however, more specific information on how the interviews were conducted, who was interviewed, and some summary and characterization of what was learned during the interviews. Please indicate if the interviews were taped and transcribed. The report indicated the results of the interviews were negative regarding specific topics, but there is no solid characterization of what was learned from these individuals. Without being able to compare what these individuals knew and didn't know, the results of the interviews appear simply negative and potentially inadequate.

The interviews appear to have identified one historic property that is associated with native Hawaiian traditions, but this is not stated explicitly in the text nor is this association considered when the significance of the property is discussed. This is the association of a mo'o waihi with the fishpond. Although there is not much information on this particular mo'o, such associations are common in Hawaiian traditions and the proper treatment of mo'o was viewed as important to the health and productivity of ponds. We ask that those sections of the inventory survey report and the DEIS which discuss the fishpond and evaluate its significance include this tradition. Some background on the nature and function of mo'o in Hawaiian traditions should also be added. Currently, only the mo'o's association with a stone at the pond's edge is noted. While specific stones were known elsewhere to be used to conduct rituals for a resident mo'o, the entire pond was generally seen as the mo'o's domain. If this is the only historic property to which a tradition was associated, then this should be specifically mentioned in the report.

If you have any questions, please call Nathan Napoka (587-0040) or Holly McEldownay (592-8028).

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

HM:amk

c. Ka'ohulani McGuire, Cultural Surveys Hawaii

Attachment 1
Specific Comments
Hawaiian Traditional Customs and Practices Study for Kapalawai, Ahupua'a of Makaweli,
District of Kona, Kauai;
Draft Environmental Impact Statement, Kapalawai Report;
and
Archaeological Inventory Survey Report for 170 Acres Including a 6-Acre Inland Fishpond
for the Proposed Kapalawai Resort, Kapalawai, Kauai, Hawaii
Hawaiian Traditional Customs and Practices Study for Kapalawai, Ahupua'a of Makaweli,
District of Kona, Kauai

page 1, para. 3. In discussing who could have had access to the property, you might want to mention that, potentially, Robinson employees may have had access to some resources on land or in the off-shore waters.

page 5, Synopsis of Interviews. The individuals participating in the interviews should be characterized in more detail and, preferably, named. These kinds of studies and the DEIS are essentially disclosure documents and interested members of the public should be able to reach their own conclusions on the adequacy of the effort. If the individuals interviewed would prefer that their names not be mentioned, then their backgrounds should be characterized in even more detail. In addition to knowing their ages, the gender of the individuals interviewed should be mentioned (e.g., how many were men and how many are women?). What were the occupations and work experiences of these individuals, including their responsibilities as Robinson family employees. Were they all of Hawaiian ancestry or are other ethnic groups represented and were most of them raised in this region of Kauai? If the individuals were not prior employees of the Robinsons, what kinds of expertise and experience did they bring to the study?

page 6, para. 3. The interviews are said to have provided useful information on the project area and its history, but very little of this information appears to be incorporated in the existing studies. This paragraph should, instead, tell the reader where this information appears in the various documents that have been or will be prepared.

pages 7 and 8 (Legal Background). A summary of the PASH decision itself should probably be presented here under its own heading as it is the document that ties all these laws and the legal precedents together and reinforces their legitimacy in the modern planning process.

page 10 (Project Area Description). We believe that off-shore areas and marine resources should be more specifically addressed because on-shore developments and access issue could affect any customs and practices potentially associated with off-shore areas. It seems inconsistent for the DEIS to address the project's potential impact on marine resources and then appear to limit the cultural assessment to on-shore areas. As the DEIS commits to providing ocean and shoreline access, addressing the potential of off-shore customs and practices does not seem to introduce any new, unresolvable issues in the planning process. Fishing was mentioned in at least one of the interviews (p. 28) and in the ethnohistorical record (p. 32).

page 19, para. 1. Our understanding of how use rights are generally applied to economically beneficial trees in Polynesia differs somewhat from the statements made here and we do not think, in theory, that known customs necessarily preclude planted trees from being subject to gathering rights by the appropriate families. Economically beneficial trees that were deliberately planted are generally owned by the individuals or families that plant them and it is the act of planting that gives these individuals long-term and often exclusive rights to gather the products of these trees. This includes rights to trees planted on lands that are not under their control. If this were the case here (and we realize this is theoretical), native Hawaiian families could claim customary gathering rights to trees specifically planted by their ancestors. In this case, the coconuts are more likely to have been planted by the Robinsons.

page 25, para. 1. Here and elsewhere there is no clear depiction of what the settlement and landuse patterns were in this region during the early historic period. There is only a general reference to numerous claims being made "inland" and a pattern of there being a high population density inland. How far from the coast are these inland populations and are they located sufficiently far inland to hinder the residents from frequently using the off-shore waters and lands immediately adjacent to the shoreline? How far up the valleys in Makaweli do the claims go?

page 27, para. 2. Did anyone know if the particular seaweed found in the fishpond was edible or of some use?

page 29 (Burials). The authors should specifically argue why they believe there are no burials in the project area. An assessment of the probability of burials is not thoroughly discussed in the archaeological inventory report either. Given the presence of substantial sand deposits in the project area, one test pit and surface surveys are not necessarily proof that no burials are present. If the nature of the sand deposits suggest a low probability of burials, this should be argued.

page 29 (Trails). Given the population of Makaweli suggested by the LCA claims and the size of the project area, it seems unlikely that there were "no ancient Hawaiian trails" in the project area. We suggest that this section be reworded. An 1891 map is not particularly early and many smaller trails may not have been depicted on a map of that scale. It may be fair to say that no record of trails was found and to point out that such a record is unlikely given the early acquisition of the property Robinson family and the possibility that they cut off access along any ancient trails when they acquired the property in 1865. When Eliza Sinclair purchased as many LCAs as possible, she may have assumed that she was extinguishing the native tenant access rights of the former LCA owners and their families.

page 29 (Heiau and Shrine Sites). The statement that "there are no previously recorded heiau within the present project area" should be restated as there were apparently three heiau known to have existed in Makaweli which have not been located and, in addition, two unallocated heiau are recorded as being somewhere in Kekupua. The conclusions should be worded with more caution. Conceivably, they could have been in the project area unless some evidence suggests otherwise. Is there any evidence to suggest that the stone associated with the mo'o wahine was a shrine?

page 32 (Fishing Grounds). In the archaeological inventory report, there is reference to *o'opu* in the streams of Makaweli being considered "sacred" (perhaps *kapu*?). Shouldn't this be added here as part of the known history of streams in or adjacent to the project area?

page 35 (Summary). In a number of respects, we feel the conclusions are stated too strongly and should probably be reworded with less certainty. Paragraph 1 says that there was "no evidence of traditional customs and practices formerly or presently exercised" in the project area. We think it can be assumed that native Hawaiians did "formerly" practice customary gathering and use rights in the project area and in the off-shore waters. Even though there were no native tenant claims within the project area, native tenants living in the *ii* or in Makaweli were likely to have had some rights to gather resources within this portion of the *ii* and to fish in the waters off-shore. This would be particularly true if an *alii* had control over all the *ii* within Makaweli. The 1857 lease document discussed in the archaeological inventory report (p. 15), indicates which resources were exempted from the lease of *kula* lands, including resources in Kekupua. To us this indicates that the 120 individuals holding the lease had gathering and use privileges for all the other resources which were not exempted. This document could, therefore, be evidence that some form of customary resource use was occurring before Eliza Sinclair acquired the property. Is there some reason this historical document was not included in the cultural impact statement when it seems to contain appropriate evidence that the *kula* lands of Makaweli were being used during this time period? The argument that any continuity in the practice of these customs was disrupted by the Robinson's ownership of the land and their management style appears to have merit with the possible exception of off-shore fishing.

We also find it difficult to believe that there were no settlements in the project area in the period prior to the Robinson's acquisition of Makaweli. If we understand correctly, there were residential complexes along the coastal areas at Waimea and Hanapepe regardless of there being greater numbers inland. Is there some reason why this would not be the case in the project area? The conclusion presented here seems to contradict that drawn in the archaeological inventory report (p. 12) which states the following: "interpretations of pre-contact land use within Makaweli can be extrapolated from Waimea. Coastal occupation and river valley settlement patterns would have mirrored those in Waimea only on a small scale." If nothing more, the fishpond would probably have had a caretaker residing nearby. Archaeological evidence would probably not confirm or deny the absence of settlements given that most of the project area has been heavily altered in recent times. Again, we suggest that these conclusions be reworded.

Draft Environmental Impact Statement, Kapalawai, Kauai, Hawaii

page 1-8, para. 2. A mitigation plan will be required for the restoration of the fishpond and it is this plan that would be reviewed by the Historic Preservation Division. It would be clearer if this paragraph makes a commitment to that plan.

page 1-14. As stated in our comments on the cultural impact statement (see comments for page 35, Summary), we feel this conclusion should be stated with more caution and qualifications.

page 1-22 (1-7 Necessary Permits and Approvals). If appropriate, you may want to mention that obtaining an Army Corps permit to clear the fishpond will entail compliance with Section 106 of the National Historic Preservation Act.

page 3-12 (Discussion): In committing to future actions concerning identified historic properties, it would be clearer to state that, as part of the mitigation plan, a preservation plan and interpretive plan will be prepared and reviewed before the plans are implemented.

page 4-27. It should be acknowledged here that interviews with knowledgeable individuals were conducted for the purpose of identifying and evaluating historic properties and this aspect of the study was conducted in conjunction with the cultural impact study.

page 4-35 (Site #50-30-9-765). The association of a *mo'o wahine* with the fishpond should be added to this description of the fishpond.

page 4-42 (Mitigation). This section should state that a mitigation plan will be prepared and implemented for all historic properties identified in the project area. This plan would include interim mitigation measures to protect historic properties during construction and development related activities, a long-term preservation plan, and an interpretive plan.

page 5-10, para. 1. As we commented previously, these conclusions should probably be stated with more caution, particularly the implication that there were no *kuleana* tenancies using the project area and that there were no settlements of any kind in the project area.

Archaeological Inventory Survey Report for 170 Acres Including a 6-Acre Inland Fishpond for the Proposed Kapalawai Resort, Kapalawai, Kauai, Hawaii (ITMK-1-7-05, Por. 1)

page 1, para. 2. The pond is said to be fed by a natural spring. Elsewhere the pond is said to be fed by three natural springs or multiple springs.

page 56 (State Site #50-30-9-765). In discussing the significance of this fishpond, it should be stated that the association between the pond and the *mo'o wahine* contributes to its significance.

CULTURAL SURVEYS HAWAII

Archaeological Studies
Hailett H. Hemmati, Ph.D.
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Kalihi, Hawaii 96734
FAX: (808) 262-4930, Bus: 262-9972
e-mail: csh@dps.net

COVER SHEET FOR TRANSMITTAL

TO: Mr. Don Hibbard

PROJECT: Hawaiian Traditional Customs and Practices Study for
Kapalawai, *Ahupua'a* of Makaweli, District of Kona, Kaua'i
(TRK 1-7-05:por. 1)

DATE/TIME SENT: February 25, 2000

FROM: 
Ka'ohulani McQuire

REMARK: Thank you for your review letter of January 26, 2000, addressed to Scott Ezer
(Log no: 24650 Doc no: 9912HM01), of an earlier version of this report.
Enclosed is a draft copy of the revised report. All comments from your January
26 review letter have been addressed and the report has been substantially
augmented. Attached is an item by item list of the revisions and additions that
were made. Please contact me if you have any questions.

cc: Holly McEldowney

Letter to Don Hibbard
February 25, 2000
Page 2

The revisions you requested in your Dec. 8th, 1999, review letter, addressed to Scott Ezer
(Log no: 24650 Doc no: 9912HM01) are discussed here by the item numbers you gave them
in your letter. Please refer to a copy of that letter for the following discussion.

Hawaiian Traditional Customs and Practices Study for Kapalawai, *Ahupua'a* of Makaweli,
District of Kona, Kaua'i

Attachment 1 - page 3: you had five items

Regarding item 1, page 1, para. 3: the information regarding the likelihood of employees
accessing land and near off-shore resources has been added and can be found on page 1,
para. 3.

Regarding item 2, page 5: Synopsis of Interviews - This section has been reworked to
include the information you requested, i.e., biographical information of the informants,
ethnicity and expertise. This can be found under the section, *Methodology for Oral
Interviews*, on pages 6-7. (The actual *Synopsis of Interviews*, which includes interview
excerpts, is now in its own section and can be found on pages 35-62.)

Regarding item 3, page 6, para. 3: information regarding where the full transcripts and
interview excerpts can be found was added to page 6, para. 4.

Regarding item 4, page 7-8 (Legal Background): because the legal interpretations of PASH
lie beyond our expertise, it was decided to remove this section from the report completely.

Regarding item 5, page 10 (Project Area Description): information on off-shore areas and
marine resources has been added and is found on page 8, par. 3 and also on page 67-69
under "Fishing Grounds, Marine Resources and Shoreline Access".

Attachment 1 - page 4: you had six items

Regarding item 1, page 19, para. 1: This paragraph was reworded to incorporate the
suggested revision and can be found on page 17, para. 2.

Regarding item 2, page 25, para. 1: A section on settlement and land use patterns has been
added and is found on pages 27-30.

Regarding item 3, page 27, para. 2: information that the seaweed was not edible was added
and can be found on page 41, par. 1 (after interview excerpt) and page 32, top - in excerpt
from interview.

Letter to Don Hibbard
February 25, 2000
Page 3

Regarding item 4, page 29 (Burials): the paragraph on burials has been rewritten based on additional sub-surface testing and information in the Archaeological Inventory Survey (Zulick, et al., 1999 [Draft]). This can be found on page 63, para. 1-2.

Regarding item 5, page 29 (Trails): This section was reworded to incorporate suggested revisions and can be found on page 63, para. 3-4.

Regarding item 6, page 29, para 1 (Heiau and Shrine Sites): Revisions to this section were made which disclose that Bennett was unable to locate three heiau in Makaweli. This can be found on page 63, para. 6, page 70, para 1. An additional paragraph was added on page 64, par. 1 stating that Goodwin's daughter, Aletha Ke'ohi had no knowledge of heiau in the project area. The lack of information regarding the mo'o stone being used as a shrine was added and is found on page 65, para 7.

Attachment 1 - page 5: you had two items

Regarding item 1, page 32 (fishing grounds): information that 'o opu were kapu was added and can be found on page 67, para 1 and page 72, para. 1

Regarding item 2, page 35 (Summary) This section was reworded and rewritten to incorporate the suggested revisions and can be found on page 72-73.

ARIUS HOPMAN
Bac. Cum Laude, MAT 2015, Cert. Ed. Kinesiology
ARIUS HOPMAN GALLERY
PO Box 1032, Hanalei, HI 96715, USA
808-335-0227

TESTIMONY, KAPALAWAI RESORT
1-6-2000

I am opposed to the Kapalawai Resort project as it is now planned, but would be open to it if it were re-planned to fit the communities' needs and the environments' dictates.

---Most of the planned development is makai of the SMA Boundary. It is in a flood zone and is endangered by tsunami. It should be re-located makai of the SMA Boundary. Special Management is an important designation.

---The planned development is too massive and could disrupt the ethnic flavor of the west side and the comfortable pace of life.

---It would encourage the development of tacky tourist traps and strip businesses.

---Such a massive development this close to the ocean is unecological for several reasons and amounts to a private monopoly of a public beach. It is not fair to local surfers, fishermen and beachgoers.

---Development out of harmony with the local community results in mounting local frustration and inevitable crime. Such a development could divide the community. Maui and the North Shore are examples of such splintering and escalating crime.

---As a Hanalei businessman I feel the priority for the West Side is to preserve it's peaceful, local lifestyle. In the long run, that is a far greater asset than development.

---The basic idea of cluster villages is viable and has worked well in Kona Village, Big Island, where the huts are made of bamboo and thatch...and rent for \$300/mo. In Kapalawai, more emphasis needs to be placed on sustainability and using natural building materials.

---If the community were involved in the planning and maintenance, rather than a top-down proposal that the owners then have to defend in hearings, a much more dynamic and integrated plan would emerge.

The Robinson family is to be commended for preserving their holdings and development of some kind must be considered reasonable. Public input may result in a much better plan integrated with the general plan of the West Side.
Mahele.

Arius Hopman, Hanalei Businessman

Helber Haster
Planners

March 9, 2000

Mr. Arius Hopman
P.O. Box 1032
Hanapepe, HI 96716

Dear Mr. Hopman:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 6, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

SMA boundary. Portions of the property are affected by flood hazards. However, with the exception of small portions of the north-makai portion of the property, Flood Insurance Rate Maps (FIRM) indicate that flooding is not related to tsunami activity, but is the result of streams overtopping their banks. Some of these same areas have been affected by the storm surge from Hurricane Iniki. No development will occur in areas affected by the hurricane storm surge. Buildings located in other areas affected by flooding will be elevated above base flood heights, in compliance with flood hazard regulations.

Project scale. The overall density of the proposed resort is approximately 1.5 visitor units per acre, which is a low density for a resort project. Buildings will be limited to two stories in height, and all of the cottages will be one story. None of the buildings will be visible from Kauruaalii Highway. The overall design concept for the resort is intended to complement the existing character of West Kauai.

Encourage poorly designed businesses. Any new development in the region will require review by the County of Kauai Planning Department, and public hearings for community input. The character of Kauai is important to all its residents. Any new development should, and must, be reviewed in the context of design suitability.

Development will increase crime. The resort will employ its own security staff 24 hours a day. This should reduce impacts related to crime on the property.

Helber Haster
Planners

Mr. Arius Hopman
March 9, 2000
Page 2



Preservation of peaceful lifestyle. The Kapalawai Resort is intended to appeal to visitors who enjoy the same peaceful ambience now found in West Kauai. The project's low density, simple design, and historic flavor are suited to Kauai's low-key lifestyle.

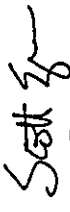
Sustainability/natural building materials. The design and building materials for the Kona Village Resort were conceived to create a feeling of traditional Pacific Island construction. Hence, the use of thatch and bamboo. The concept for Kapalawai is meant to convey a design that is more contemporary with the former Robinson Family residence which is a centerpiece of the property.

Community involvement in planning and maintenance. Before the applicant submitted any materials related to permit requests to the County of Kauai, several meetings were held to informally present a proposed plan to West Kauai residents. We are always ready and willing to listen to any input from the community. If you would like to arrange a meeting to discuss the project, please contact Mr. Michael Belles, at 247-2405, extension 228.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC



Kaui Group of the Hawaii Chapter
 Post Office Box 9418
 Lihue, Kauai, Hawaii 96766

January 6, 2000

Keith Nims
 County of Kauai, Planning Department
 4444 Rice Street, Ste 473
 Lihue, Hawaii 96766

Comments on Kapalawai Resort
 Draft Environmental Impact Statement

To the Planning Department

We have serious reservations about the proposed Kapalawai Resort development. While the developers are to be complimented on their efforts to create a resort that is low density and aims to minimize environmental impacts, we find that the proposed construction of the resort is inappropriate at the present time, and more seriously is inappropriately located.

The change of zoning and the construction of the resort is inappropriate at this time. Kauai already has at present more than enough zoning for resort development. This together with the recent approval of the Kikumiki development, as well as other existing resorts that are planned to be reopened, means that we will soon exceed our island's carrying capacity.

The location of the resort is inappropriate. There is no compelling public benefit or reason for extending the resort into the SMA zone. Most of the structures would be visible from the beach, thereby not complying with the following policies and objectives of the Coastal Zone Management CZM 205A-2:

CZM 205A-2 b 3 A "Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources".
 The plan to locate structures within close proximity to the beach as the project proposes does not protect and preserve the quality of coastal scenic and open space resources, therefore the project does not comply with this guideline.

CZM 205A-2 b 3 B "Ensure that new developments are compatible with their vernal environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline".
 While the cottages are nicely designed to blend in with the environment, their mere placement close to the shoreline would interfere with public views to and along the shoreline.

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CZM 205A-2 b 3 D "Encourage those developments which are not coastal dependent to locate in inland areas".

In reference to 3D the Kapalawai Resort Draft Environmental Impact Statement explains on page 3-12, "Although the proposed use is not coastal dependent, many other successful resorts on Kauai, and throughout the State are typically located on ocean front parcels." Our comment is since it is not coastal dependent then this project must be encouraged to locate in inland areas to be in compliance with the Coastal Zone Management program.

Since the project as presented is located within the Special Management Area and therefore within SMA jurisdiction, to be exempt from the SMA rules and CZM guidelines the project must be located outside of the SMA boundary. (Boundary depicted in Figure 7 on page 3-18.)

It is also inappropriate at this time to preempt the present long range planning process of the General Plan Update and all of the citizen input that has gone into it for the past two years.

Thank you for considering these comments

Mary S. Hall
 Monse Hall
 Conservation Chair
 Kauai Group of the Hawaii Chapter Sierra Club

COUNTY OF KAUAI
 JAN 7 9 50
 PLANNING DEPT.

Helber Haster
Planners

Mr. Monte Hull
March 9, 2000
Page 2

of the resort (low-density, low-profile structures), and its landscaping will serve to blend the built environment with the natural environment as seen from the shoreline.

In reference to your concern that the project be located to inland areas, it should be pointed out there is no prohibition of oceanfront development. If oceanfront development does occur, it needs to be undertaken in a manner that is sensitive to all appropriate environmental considerations and mitigation efforts. It has never been suggested that the Kapalawai Resort be exempted from the requirements of the County of Kauai procedures and regulations for the SMA. The EIS is the first step toward achieving necessary government approvals, including a Special Management Area Use Permit (SMP).

You also suggest that the proposed resort preempts the ongoing General Plan Update now underway, with the assistance of a citizen's advisory committee (CAC). It should be pointed out, that from the outset of this process the Robinson Family has indicated its desire to develop the Kapalawai property as a resort. The Kauai 2020 Vision Plan includes language that supports additional visitor units on the West Side, and recommendations now before the CAC include designating the Kapalawai property for resort development. Rather than preempting the General Plan Update, this EIS is supporting the process in a parallel fashion.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC



Helber Haster
Planners

March 9, 2000

Mr. Monte Hull
Conservation Chair
Kauai Group of the Hawaii Chapter Sierra Club
P.O. Box 3412
Lihue, HI 96766

Dear Mr. Hull:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 6, 2000 on the above draft environmental impact statement (EIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

The change of zoning and the construction of the resort are inappropriate at this time. The County of Kauai's General Plan Update, and the applicant's petition for a General Plan Amendment are actually running a parallel course. This allows the public, the Planning Commission, and the County Council the opportunity to review the proposal in more detail than would otherwise have been available for consideration during the General Plan Update. For your information, the Kauai County Planning Department and its Citizen's Advisory Committee are now in the process of reviewing drafts of the General Plan Update Report (including map changes), and the Kapalawai Resort is included in the current draft of the General Plan recommendations.

The location of the resort is inappropriate. A large portion of the project site lies within the Special Management Area (SMA). The area outside of the SMA includes the Robinson Family's former residence and associated accessory buildings. In consideration of the desire to maintain the integrity of this historically significant group of buildings, the central elements of the remainder of the resort buildings were located away from this area, and fall within the SMA. Contrary to your assertions that the public will suffer because of the construction of these buildings, it is precisely because these buildings are within the SMA, that the public will be guaranteed access to the shoreline through the property. It is arguable that the presence of the low-rise simple cottage units will intrude on the quality of coastal scenic and open space resources. The design

MARYANNE W. KUSAKA
MAYOR



VIRGINIA M. KAPALI
DIRECTOR

COUNTY OF KAUAI
OFFICE OF ECONOMIC DEVELOPMENT
4444 Rice Street, Suite 200 Lihue, Hawaii 96746
Tel: (808) 211-4330 Fax: (808) 211-4330

continue to strive and seek solutions to stimulate our island economy and promote job opportunities for Kauai's residents.

Should you have any further questions, please call our office for assistance.

Sincerely,

Virginia M. Kapali

Virginia M. Kapali
Director

December 28, 1999

Mr. Dee Crowell, Planning Director
Kauai Planning Director
4444 Rice Street
Lihue, HI 96766

ATTN: Keith Nitta, Planner

RE: Kapalawai Resort - Draft Environmental Impact Statement, October 1999

cc: Mayor Maryanne Kusaka
Office of Environmental Quality Control
Lewis Geysler, Destination Villages Kauai, LLC
Scott Ezer, Helber Hastert & Fee, Planners

Thank you for the opportunity to comment on the Draft EIS for the Kapalawai Resort project planned to be developed in West Kauai. As the County Office of Economic Development, we promote economic opportunities towards the development of a healthy and balanced economy for Kauai's residents. We offer the following comments:

In review of the Draft EIS, the development of Kapalawai is projected to infuse in the local community a welcomed economic stimulus. By year 2001, an anticipated 240 construction workers will be on site with a multiplier effect of \$30.2 million in the purchase of goods and services. The projected long-term economic impact is far reaching to the west side community, as Kapalawai should offer an opportunity for a stabilized workforce in the resort operations.

The new revenue source in terms of direct visitor expenditures, creation of business enterprises, increased property valuation, and increased personal income for our local residents will provide an economy of scale in a rural area. Most importantly, the applicant has committed that Kapalawai Resort will preserve the historic and cultural value of the property and achieve a unique hospitality product symbolic of the natural rural character of West Kauai.

Although 1999 has been a benchmark year in Kauai's economy, our unemployment rate at 6.9% (Nov. 1999) still show that we are nearly double than the national average. To this end, we

Helber Hastert
Planners

March 9, 2000

Ms. Virginia M. Kapali, Director
County of Kauai
Office of Economic Development
4444 Rice Street, Suite 200
Lihue, HI 96766

Dear Ms. Kapali:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated December 28, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We note that your comments reflect the projected long-term economic impacts of the proposed resort, and the opportunity for a stabilized work-force in the resort operations. We also appreciate your recognition that the applicant has committed to the preservation of the historic and cultural value of this important property, and that Kapalawai Resort will achieve a unique hospitality product that complements the existing character of West Kauai.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Scott Ezer

Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

PHONE (808) 594-1888



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

December 14, 1999

Mr. Keilh Nitta
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, HI 96766

(EIS #353)

Subject: Draft Environmental Impact Statement (DEIS)
For Kapalawai Resort, Waimea, Kauai
TMK: (4) 1-7-05:01

Dear Mr. Nitta,

Thank you for the opportunity to comment on the above referenced project. At this time, the Office of Hawaiian Affairs have no comments to the proposed project. If you have any questions, please contact Mark A. Mararagan, Policy Analyst-Government Regulations at 594-1945.

Sincerely,

Colin C. Kippen, Jr.
Colin C. Kippen, Jr.
Deputy Administrator

cc: OHA Board of Trustees
Kauai CRS
Office of Environmental Quality Control (OECC)
Mr. Lewis Geyser, Destination Villages Kauai, LLC
Mr. Scott Ezer, Helbert Hastert & Fee, Planners

FAX (808) 594-1865

Helber Haster
Planners

61-746 Papaioua Road, Haleiwa, Hawaii 96712
Telephone: 808-637-4076; Fax: 808-637-2382

Richard F. Knobel

March 9, 2000

Mr. Colin Kippen, Deputy Administrator
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813-5249

Dear Mr. Kippen:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

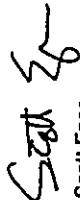
Thank you for your letter dated December 14, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We note that at this time the Office of Hawaiian Affairs has no comments regarding the proposed project.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBERT HASTER & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC


Fax



To: Destination Villages Kauai From: Richard F. Knobel
Fax: 805-687-8206 Pages: 2 (Hard copy by U.S. mail)
Phone: 805-687-8788 Date: 6 January 2000
Re: Kapalawai Resort CC: County of Kauai Planning Department
Helber Haster & Fee, Planners
Office of Environmental Quality Control
William Saunders, Esq.

Urgent For Review Please Comment Please Reply Please Recycle

● Comments:

Dear Mr. Geysler:

I am writing you to comment on the Draft Environmental Impact Statement (DEIS) for your proposed Kapalawai Resort on the island of Kauai. Since I have been unable to obtain a copy of the draft EIS, I am replying to the Office of Environmental Quality Control's summary of the DEIS that was included in "The Environmental Notice" of November 23, 1999.

The proposed Kapalawai Resort appears very similar to the DEIS for your proposed "Pua'ena Eco-Camp" dated October 1998. Both projects are approximately the same scale: 250 visitor units (or colleges) on 170 acres of land with 465 parking spaces for the proposed Kapalawai Resort on Kauai, versus 252 "eco-lenis" on 145 acres of land with 400 parking spaces for the proposed "Pua'ena Eco-Camp" on Oahu. However, the permits required for the two proposed resorts are different: State land use, SMP, zoning amendment and general plan amendment for the proposed Kapalawai Resort on Kauai versus a Special Management Area Use Permit and a Conditional Use Permit for the proposed project on Oahu.

Helber Haster & Fee, Planners
1000 Kapiolani Blvd., Suite 500
Honolulu, Hawaii 96813



January 6, 2000

Since both projects are proposed resorts intended primarily for overseas visitors, the use of language to describe the two projects is markedly different in the two Draft Environmental Impact Statements:

- Kauai Resort DEIS
- Oahu Resort DEIS
- "Resort"
- "Camp"
- "Visitor units" or "cottages" (250)
- "Eco-Tents" (252)
- "Restaurants" (2)
- "Cafeterias" (2)

Both projects are indeed resorts for visitors from overseas primarily. The use of different terminology to describe the Oahu and Kauai resorts is intended to misleadingly and narrowly meet the zoning and land use requirements of the City and County of Honolulu. Whereas the DEIS for the proposed project on Kauai correctly calls that project a resort containing cottages or visitor units (as the DEIS for the resort at Pua'ena Point on Oahu should have called it). On the other hand, the DEIS for the proposed Oahu project misleadingly calls it a camp with tents.

Thank you for this opportunity to comment on the DEIS for the proposed Kapalawai Resort on Kauai. Please send me a copy of the Final Environmental Impact Statement when it is completed.

Sincerely yours,

Richard F. Knobel

Richard F. Knobel

HELBER HASTERT
Planners

March 9, 2000

Mr. Richard F. Knobel
61-746 Papatoua Road
Haleiwa HI 96712

Dear Mr. Knobel:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 6, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

The balance of your letter deals with your comparison of the proposed resort at Kapalawai to another project planned by the developer at Kawailoa on Oahu. There are no comments pertaining to specific points or information contained in the DEIS for the Kapalawai project. We respectfully submit that any comments or questions you have concerning the proposed development on Oahu are inappropriate and therefore, not relevant to the consideration of the DEIS for this project, and should be addressed to appropriate agencies with jurisdiction on Oahu.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

DEPARTMENT OF WATER
County of Kauai

"Water has no Substitute - Conserve It"

December 3, 1999

Department of Planning
County of Kauai
Attn: Mr. Keith Niiza
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Niiza:

Subject: Draft Environmental Impact Statement (DEIS) for Kapalawai Resort,
TMK: 1-7-05:001, Waimea, Kauai, Hawaii

We have no comments to the proposed Draft Environmental Impact Statement for the Kapalawai Resort, provided the applicant is made aware that the proposed project is outside general planned development area for the Waimea water system. Domestic water service for this project will not be available from the Department of Water, County of Kauai.


Ernest Y. W. Lau
Manager and Chief Engineer

12/3/99
Date

cc: Office of Environmental Quality Control
Destination Villages Kauai, LLC
Helber Hasteret & Fee, Planners

KAWAII
A DEIS-Kapalawai.com/hl

Phone No. (808) 245-5400 - Administration FAX No. (808) 245-8528 - Engineering/Field/Facility FAX No. (808) 245-5813
- 4398 Pua Loke Street, Lihue, Kauai, Hawaii or P. O. Box 1706, Lihue, HI 96766-5706 -

Helber Hasteret
Planners

March 9, 2000

Mr. Ernest Y.W. Lau
Manager and Chief Engineer
Department of Water
County of Kauai
4398 Pua Loke Street
Lihue, HI 96766

Dear Mr. Lau:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated December 3, 1999 on the above draft environmental impact statement preparation notice (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We note that other than pointing out that domestic water service for the proposed project will not be available from the Department of Water, you have no other comments on the DEIS. Further, it should be noted that the developer intends to implement a private water system to service the resort project.

If you have any questions regarding this project, please call me at 845-2055.

Sincerely,

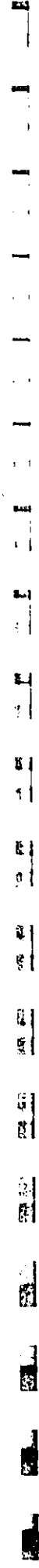
HELBER HASTERET & FEE, PLANNERS



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Hasteret & Fee
Construction Center, Makai Annex
211 Bishop Street, Suite 200
Honolulu, Hawaii 96811



SCOTT EZER
PLANNERS

EZER
PAUL G. LE MAHIEU, Ph.D.
SUPERINTENDENT OF EDUCATION



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

December 9, 1999



March 9, 2000

Dr. Paul G. LeMahieu
Superintendent of Education
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, HI 96804

Dear Dr. LeMahieu:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Mr. Dee M. Crowell
Planning Director
County of Kauai Planning Department
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Kapalawai Resort Draft EIS

The Department of Education has no comment on the subject draft environmental impact statement.

Thank you for the opportunity to respond.

Very truly yours,

Paul G. LeMahieu

Paul G. LeMahieu, Ph.D.
Superintendent of Education

PLeM:hy (sp)

cc: OBS
L. Geyser, Destination Villages Kauai, LLC
S. Ezer, Helber Haster & Fee Planners /

Thank you for your letter dated December 9, 1999 on the above draft environmental impact statement preparation notice (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We note that you have no comment on the DEIS.

If you have any questions regarding this project, please call me at 545-2055

Sincerely,

HELBER HASTER & FEE, Planners

Scott Ezer

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Helber Haster & Fee, Inc.
1111 Bishop Street, Suite 2000
Honolulu, Hawaii 96813

Helber Hastert
Planners

(P) 1882.9

March 9, 2000

Mr. Gordon Matsuoka
Public Works Administrator
Department of Accounting and General Services
Division of Public Works
P.O. Box 119
Honolulu, HI 96810

Dear Mr. Matsuoka:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

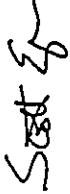
Thank you for your letter dated January 4, 2000 on the above draft environmental impact statement preparation notice (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We note that the proposed resort does not impact any of your facilities.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Kauai, Hawaii 96766

Attention: Mr. Keith Mitta

Gentlemen:

Subject: Kapalawai Resort
Maimea, Kauai, Hawaii
Draft Environmental Impact Statement

Thank you for the opportunity to review the subject document.

The proposed project does not impact any of our facilities.

Should there be any questions regarding the above, please have you staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Sincerely,



GORDON MATSUOKA
Public Works Administrator

RY:mo

c: Destination Villages, Kauai, LLC
Helber Hastert & Fee, Planners
Office of Environmental Quality Control



Helber Hastert & Fee, Planners
1000 Kalia Road, Suite 1000
Honolulu, Hawaii 96813



SIERRA CLUB, HAWAII CHAPTER

P.O. Box 2577
Honolulu, HI 96803
tel: 538.6616

Director: Jeffrey Mikulina
jeff.mikulina@sierraclub.org
fax: 537.9019

Mālama i ka Honua

6 January 2000

Helber, Hastert & Fee, Planners
Attn: Scott Ezer
733 Bishop St. Suite 2590
Honolulu, HI 96813

Destination Villages Kauai, LLC
Attn: Lewis Geysler
4439 Via Abingada
Santa Barbara, CA 93110

County of Kauai Department of Planning
Attn: Keith Nitta
4444 Rice St. Suite 473
Lihue, HI 96766

RE: Kapalawai Resort

The Sierra Club, Hawaii Chapter, is concerned with the proposed resort construction in the undeveloped Makaweli area. Most alarming is the fact that the land is zoned agriculture and conservation—with 30% of the agricultural land identified as "prime." Building large resorts away from urbanized areas is inappropriate—it is sprawl and destroys open space. Resort uses should be confined to those areas slated for growth. The Makaweli area should remain rural.

The Sierra Club, Hawaii Chapter heartily endorses the principles of eco-tourism, and the Kapalawai proposal has many outstanding features, such as the restoration of the fishpond. Nevertheless, because of the location, we oppose the Kapalawai Resort.

We ask that the following issues be better discussed in the final EIS.

1. **ZONING.** In November 1999, the County Council approved 700 resort units in Kukuihā—against the General Plan Citizen Advisory Committee's determination that such new zoning would overextend the visitor carrying capacity. Shouldn't the County wait for hotels damaged by hurricane Iniki to reopen before more resort zoning is approved? Shouldn't the new General Plan be completed and its recommendations examined before additional resorts are planned and built?
2. **AGRICULTURE LAND.** Prime agricultural land is protected by the Hawaii State Constitution. How do you reconcile the destruction of prime agricultural land for the construction of a 250-unit resort?
3. **ECONOMY.** According to a poll done by KPMG for the Hawaii Tourism Authority, 77% of Hawaii residents believe the economy is too dependent on tourism. How will the Kapalawai Resort, as a tourist destination, actually *diversify* Kauai's economy?

Recycled Content

Sierra Club, Hawaii Chapter, comments regarding Kapalawai Resort 6 January 2000 2

4. **SOLID WASTE.** The EIS states that the Keleha municipal solid waste landfill has only 5-1/2 years of capacity remaining. Will that lifespan be shortened with the addition of up to 90 cubic yards of weekly resort waste?
5. **ENDANGERED TURTLES.** Endangered green sea turtles were spotted in waters off the proposed project site, but no nests were found on the beach, according to the EIS. If the green sea turtles do nest there, how will the nests be protected from the estimated 365 daily Kapalawai visitors?
6. **LIGHTING.** No lighting should be used near or facing the shoreline. Artificial lighting interferes with the nesting of threatened green sea turtles and seabirds.
7. **SHORELINE PROCESS.** Coastal retreat is occurring statewide, due to island subsidence and climate change. It appears from the EIS that cottages will be located as close as 40 feet from the shoreline. This is unacceptable—no structures should be built within 150 feet of the shoreline and none should be built on or makai of the dune. By setting structures back far enough, the need to build seawalls is reduced and property protected.
8. **AIRPORT PRESSURE.** If Kapalawai is constructed, will there be greater pressure to expand the Lihue airport to accommodate the anticipated 365 daily visitors?
9. **ENERGY.** The Kapalawai Resort EIS claims to be environmentally-sensitive. Will the resort conform or exceed the Hawaii Model Energy Code? Will solar hot water be used? Will photovoltaics or other renewable electric energy sources be used? What will be the average and peak load electricity demand be for the resort? How will this impact the need for construction of new generating capacity on Kauai?
10. **COASTAL DEVELOPMENT.** Chapter 205A of the Hawaii Revised Statutes has a policy to "concentrate coastal development in appropriate areas." On page 3-14 of the EIS, you claim that "the proposed resort is not a coastal development." Why isn't Kapalawai, with cottages mostly in the SMA and as close as 40 feet from the shoreline, a coastal development? Shouldn't such a coastal development be concentrated in previously urbanized areas?
11. **WETLAND.** The proposal to enhance the wetland by removing alien species and planting natives is a great idea.
12. **ALTERNATIVES.** The only alternatives investigated were a golf course, residential, high density resort, mixed use commercial, and no action. Why wasn't agricultural production, such as organic produce, investigated?

We appreciate the opportunity to offer these comments and look forward to your response.
Sincerely,

Jeff Mikulina

Director, Sierra Club, Hawaii Chapter

cc: Office of Environmental Quality Control

March 9, 2000

Mr. Jeffrey Mikiluna
Director
Sierra Club, Hawaii Chapter
P.O. Box 2577
Honolulu, HI 96803

Dear Mr. Mikiluna:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 6, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

Zoning. The County of Kauai's General Plan Update, and the applicant's petition for a General Plan Amendment are actually running a parallel course. This allows the public, the Planning Commission, and the County Council the opportunity to review the proposal in more detail than would otherwise have been available for consideration during the General Plan Update. For your information, the Kauai County Planning Department and its Citizen's Advisory Committee are now in the process of reviewing drafts of the General Plan Update Report (including map changes), and the Kapalawai Resort is included in the current draft of the General Plan recommendations.

Agricultural land. We note your reference to the Constitution of the State of Hawaii, and its requirement to preserve agricultural lands. Article XI, Section 3, of the State Constitution includes the pertinent language in regard to agricultural land. While you correctly assert that preservation of agricultural land is important, you fail to apply the conditions under which land should be deemed to be worth preservation. The State Constitution also requires the Legislature to develop standards and criteria to determine which lands should be deemed important. As you are aware, since the adoption of this language in 1978, no such standards and criteria have been developed.

We would not characterize the development of the Kapalawai Resort as the "destruction of prime agricultural land," as you suggest. The only area on the

Mr. Jeff Mikiluna
March 9, 2000
Page 2



property possessing high agricultural value (according to ALISH and Land Study Bureau mapping), is the area that contains the former Robinson Family residence and associated buildings. Agricultural preservation is one of the primary reasons the Robinson Family decided to seek resort use of the Kapalawai property. It is significant to note that this property has been one of the primary residences for the family since the latter part of the 19th century, and has never been included in the lands used for agricultural production. The instability in sugar markets has caused the Family to develop other sources of income to offset this instability, thereby supporting continued agricultural use elsewhere in the region.

Economy. The development of the Kapalawai Resort will diversify the economy of West Kauai, and the entire island. In the case of West Kauai, the only visitor units in the area are found at the Waimea Plantation Cottages property. The addition of visitor units at Kapalawai will broaden the presence of the visitor in industry in West Kauai, thus diversifying its economy. In addition, the style of development, and the emphasis on the historic features of the property will appeal to visitors who might not otherwise have chosen to travel to Kauai. The visitor market is not homogeneous, and is actually made up of many different markets. The Kapalawai Resort will help to broaden the diversity of product type found on Kauai, thus diversifying the overall appeal of the Kauai market.

Solid Waste. The volume of solid waste that would be placed in the Kekaha Landfill from Kapalawai represents significantly less than one percent of its volume. As such, the life span of the landfill will not be adversely impacted in a significant manner.

Endangered sea turtles. If any nests are discovered on the beach, they will be marked and fenced for protection until the eggs hatch. Currently, there is no such protection for any nests that may exist.

Lighting. Any lighting necessary in the vicinity of the shoreline will be designed so as not to interfere with green sea turtles and seabirds.

Shoreline process. We share your concern about construction too close to the shoreline. All structures will be setback from the certified shoreline at least 100 feet. As you are aware, there is a strip of land on the shoreline that lies within the State Conservation Use District. No construction will occur in this area.

Helbert Hastert
Planners

Mr. Jeff Mikituna
March 9, 2000
Page 3

Airport pressure. The total of 365 daily visitors at Kapalawai represents about two percent of the current average daily visitor census (about 17,000) that is present on Kauai. Decisions regarding the expansion of the Lihue Airport will be made on considerations unrelated to the Kapalawai Resort. In fact, Governor Ben Cayelano recently announced that the State of Hawaii will abandon its intent to lengthen the runway at the Lihue Airport. It should also be pointed out, that market assessments prepared for the project indicate that about 20% to 25% of the total visitors to Kapalawai will be from Oahu, who will travel to Kauai whether the airport is expanded or not.

Energy. To the greatest extent possible, alternative energy sources will be utilized at Kapalawai. Solar water heating is an ideal use of alternative energy at Kapalawai because of the local climate (where it rarely rains, and has an abundance of sunshine). The average demand for electricity at Kapalawai is anticipated to be about 800 KVA. The determination of need for additional future generating capacity on Kauai was made independent of the demand likely at Kapalawai.

Coastal Development. The EIS says that Kapalawai is "not coastal dependent," instead of "coastal development," as you suggest in your letter. The reference to "coastal dependent" in Chapter 205A, HRS is geared more toward harbors and ports. The objective this language falls under is "Economic Uses." The language in this section recognizes that visitor industry facilities are "coastal related," and suggests that such facilities be "located, designed, and constructed to minimize adverse...impacts in the coastal zone management area." The design of the Kapalawai Resort takes this language to heart. No cottages at Kapalawai will be as close to the shoreline as you suggest in your letter (40 feet). There is a strip of land mauka of the shoreline that falls within the State Conservation Land Use District. Cottages will be set back a minimum of 100 feet from the shoreline, and will also respect inundation lines established by Hurricane Iniki.

Wetland. We assume your reference here is to the fishpond area, which we propose to restore, which will provide more open-water habitat for Hawaii's endangered water birds.

Alternatives. One of the primary goals established by the Robinson Family for their property at Kapalawai was the establishment of a long-term maintenance program that would take care of the former Family residence and the fishpond.

Helbert Hastert
Planners

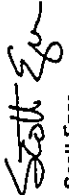
Mr. Jeff Mikituna
March 9, 2000
Page 4

Because of the cost involved in such an endeavor, agricultural revenue was considered insufficient to ensure these historic treasures are protected.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Oxford 517 • Honolulu, Hawai'i 96822
Telephone: (808) 956-7381 • Facsimile: (808) 956-3900

January 7, 2000
RE:0700

Mr. Lewis Geyser
Destination Villages Kauai, LLC
4439 Via Abigaila
Santa Barbara, California 93110

Dear Mr. Geyser:

Draft Environmental Impact Statement Kapalawai Resort Waimea, Kauai

The Kapalawai Resort project involves the development of a 170 acre low-intensity and low density, eco-tourism focused resort on a former homestead of the Robinson family. The emphasis of the development will be on maintaining the character and historic traditions of the site.

We have been assisted in this review by University of Hawaii faculty members: Marshall Mock, Physical Sciences, Kauai Community College; Mark Metlin, Geography; Bronn Griffin, Anthropology; Michael Graves, Anthropology; Viktor Moreland, Water Resources Research Center; and James Moncur, Economics.

General Comments

In general, the Draft EIS adequately characterizes many of the potential impacts that can be anticipated to occur with this project, and correctly finds in many cases that the impacts are not likely to be significant. In particular, our reviewers concurred that significant impacts to botanical resources or the fishpond are unlikely and that the discussions regarding the social and economic consequences of the development are reasonable. However, there are several key areas where additional information is needed. Our reviewers have identified these areas in the paragraphs to follow and we offer some possible sources of information that may be useful in addressing the concerns and drafting the Final EIS.

An Equal Opportunity/Affirmative Action Institution

Mr. Lewis Geyser
January 7, 2000
Page 2

Relationship of the Proposed Project to Existing Public Plans, Policies, and Controls

The DEIS provides a review of the various Land Use Plans and policies for the state of Hawaii and Kauai in particular, and then concludes with the acknowledgment (pg. 3-24) that the project site is located in an area zoned for Agriculture and Open and that resort development, such as is proposed, is not a permitted use. While we appreciate the interests of the project proponents and their attempts to develop an ecologically compatible resort on this parcel, nevertheless, we do feel obliged to ask what justifies an amendment to the existing land use plans? Why should such an amendment be granted? If the Kauai citizen representatives have developed, after considerable diligence and discussion, certain land use policies, then what is the rationale to permit such a major modification of those plans and policies? What precedent will this action create for future land use zoning requests? The impact of this decision is perhaps the most significant impact that must be discussed in the Final EIS.

Floors

Our reviewers have concurred with the DEIS regarding the description of the flora on the project site and the probable lack of endangered species on the former ranch lands. One point that we would like to stress however, is the use of native species when landscape plans are being developed for the graded and cleared areas. The use of native species in open areas will significantly augment the cultural and ecological focus of the development. It is our understanding that some members of the Robinson family have considerable expertise in the culturing and raising of native species. This would be an ideal opportunity to use this expertise.

Marine Environment

We note that both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service have raised concerns for the effects of the development on endangered turtles and Monk seals. The DEIS mentions these concerns (pg. 4-25) but concludes that, *the potential for impacts to marine communities as a result of development of the Kapalawai Resort appear to be minimal or non-existent*. There does not appear to be any evidence to substantiate this conclusion. Present use of the beach at Kapalawai was not indicated in the DEIS. Mention is made (pg. 6-33) that current access to the shoreline is used primarily by surfers, but there is no indication of the number or frequency of beach/surfer "users". The suggested daily average of about 365 persons per day at the Resort (pg. 6-32) would appear to lead to a substantial number of people using the beach. Whether this is significantly more beach users than at present can not be determined from the information provided in the DEIS. The concern here is that additional beach use, particularly of the beach itself rather than just surfing, may pose a significant deterrent to turtle nesting or Monk seal haul out. We strongly suggest that you contact Drs. George Balazs (turtles) and William Gilmanin (monk seals) of the National Marine Fisheries Service, Honolulu Office for their assessment of the significance of the development on these endangered species and ways to mitigate potential impacts.

Mr. Lewis Geyser
January 7, 2000
Page 4

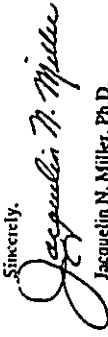
Wastewater Systems and Drainage

The DEIS contained very little information on the design of the wastewater treatment system that will be used for this project. While we appreciate the information as to the volumes of wastewater that will be produced and are pleased to see the plan to recycle much of the treated effluent for irrigation, there is almost no information on the specific design and engineering that will be undertaken to carry out the wastewater treatment plans. Similarly, relatively few specifics are provided on the drainage plans. The Final EIS should present a more complete overview of the wastewater treatment and drainage systems for the project.

The DEIS mentions that the nearshore water receives significant amounts of silts, clays, and muds from run-off. To avoid further degradation of the coastal environment, we would strongly suggest that extra precautions be taken to eliminate or at least significantly minimize erosion and loss of soils to the near shore during house and road construction.

In closing, the Robinson family is to be commended for their attempts to consider the natural and cultural environment in their plans. However, we remain concerned about the long term ramifications of the issuance of an amendment to the existing land use plans for this project. We appreciate the opportunity to offer our comments on the Draft EIS and look forward to your response in the Final EIS.

Sincerely,



Jacquelin N. Miller,
Associate Environmental Coordinator

cc: Planning Department, Kauai
Helber Hastert & Fee, Planners
OEQC
James Moxaur
Marshall Mook
Blon Griffin
Victor Munsland
Michael Graves
Mark Merfin
Peter Rappa

Mr. Lewis Geyser
January 7, 2000
Page 3

Archaeology

It appears that the archaeological reconnaissance of the area was reasonably thorough with two exceptions: areas of dense vegetation and subsurface reconnaissance. Our reviewers noted that the report mentions avoiding areas of dense vegetation, yet those may be the exact areas where least disturbance has taken place, hence a greater opportunity for the retrieval of archaeological information. Furthermore, they have expressed considerable concern that the areas that will be excavated for utilities, i.e. power, water, and sewage, or house footings/paths have not been adequately examined. We note that significant time delays in construction can be experienced if burials or other significant artifacts are unearthed during excavations for roads, utilities, or cabin footings. Because this area has an abundance of fresh water, excellent coastal access, and generally friendly environment, it would appear highly likely that burials or other significant archaeological remains from prehistoric populations may be present throughout the area and particularly in the vicinity of the shoreline. We urge that additional, subsurface excavations be undertaken in the areas that will house the various utilities, particularly water and waste, including marholes, so that damage to potential sites will be minimized as well as delays in construction avoided.

The shovel test pits around the stone structure (described in Appendix D, pg. 46) were of insufficient depth to provide an accurate estimate of archaeological significance. The pits were much too shallow to provide adequate archaeological information and the conclusions as to the geologic features encountered, i.e. bedrock, are highly questionable given the described, "loose fragments of stone and dirt." The stone pile described on pages 31 and 37 of Appendix D, appears to have somewhat of a star-shaped design similar to the stone features found elsewhere in Polynesia. Has this been considered? Our reviewers concurred with the conclusions expressed in the report that the stone pile may well have some archaeological significance, and not just be the result of field clearing. This stone pile site, SO-30-9-763, deserves more examination and comment. Is it possible that this site could be one of the 3 heiau sites which were told to Bennett but which could not be located by him?

Traditional Cultural Practices Report

There are numerous misspellings of Hawaiian terms throughout this report, apparently the result of incorrectly printing the discetics used in representing Hawaiian words. These mistakes should be corrected in the Final EIS.

Tsunami Hazard

There appears to be a misprint or sentence missing on page 4-44 regarding flood hazard from tsunami inundation. We note that the tsunami run-up estimates for this area are approximately 11 feet above MSL (Loomis, 1980). Thus, a major portion of the coastal region of the Kapalawai resort is subject to flooding by tsunamis (fig. 20). Presumably this potential has been taken into account in the design of the buildings and their base structures to avoid structures floating off their bases.

Heller Hantert
Hunters

March 9, 2000

Ms. Jacqueline N. Miller
Associate Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
2550 Campus Road
Crawford 317
Honolulu, HI 96822

Dear Ms. Miller:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 7, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

Relationship of the Proposed Project to Existing Public Plans, Policies and Controls. The County of Kauai is presently completing an update of its General Plan (last done in 1981). The County's General Plan Update, and the applicant's petition for a General Plan Amendment are actually running a parallel course. This allows the public, the Planning Commission, and the County Council the opportunity to review the proposal in more detail than would otherwise have been available for consideration during the General Plan Update. For your information, the Kauai County Planning Department and its Citizen's Advisory Committee are now in the process of reviewing drafts of the General Plan Update Report (including map changes), and the Kapalawai Resort is included in the current draft of the General Plan recommendations.

Flora. We acknowledge your concurrence concerning the use of native species in the landscaping for the resort.

Marine Environment. In response to your comments, we contacted Dr. George Balazs and Margaret Dupree of the National Marine Fisheries Service (NMFS) (William Gilmarin no longer works for NMFS). Dr. Balazs was familiar with the green sea turtles which frequent the coast of West Kauai and indicated that these turtles are known to haul out at French Frigate Shoals for nesting

Heller Hantert
Hunters
222 Bishop Street, 2nd Floor
Honolulu, Hawaii 96813

Heller Hantert
Hunters

Ms. Jacqueline Miller
March 9, 2000
Page 2



purposes. He indicated that development of the shoreline in the manner proposed would not present a problem for these turtles. In regard to monk seals, Ms. Dupree related that NMFS is currently working on protocols to guide human activity in the vicinity of monk seals that have hauled out. These protocols will include guidance on appropriate separation distances between human and monk seals and who to call when a monk seal is observed on the beach. Ms. Dupree also indicated her support of proposals on behalf of the developer to provide marine education during training for resort employees, so that they will be able to react appropriately when monk seals (or green sea turtles) are encountered. Similarly, information will be developed for guests at the resort to orient them to the marine environment (including green sea turtles and monk seals).

In regard to the U.S. Fish and Wildlife Service, we received a letter dated January 11, 2000 from the Service commenting on the DEIS. Their letter includes the following observations:

"In general, the Service believes that the DEIS adequately describes the proposed action and the primary fish and wildlife resources located at the proposed project site. The Service believes that among the alternatives considered in the DEIS, the preferred alternative is the action least likely to impact fish and wildlife resources. Potential impacts to fish and wildlife resources have been adequately addressed in the DEIS, and the mitigation that is proposed is adequate to minimize anticipated unavoidable impacts to fish and wildlife resources."

Archaeology. We are happy to report that we have conducted additional subsurface excavations within the project site, including 23 trenches. The results of these excavations will be included in Section 4.9 of the FEIS. In regard to your comment regarding the shovel test pits around the stone structure, the archaeologist reports that additional excavation was not necessary because a sterile layer was encountered at the point that digging ceased. This was the case for all eight test shovel pits in the vicinity of the platform.

The archaeologist also considered the possibility of similarity to other stone features in Polynesia. This consideration was made in two contexts: (1) as a Russian fort; and (2) as similar to star-shaped structures in Western Samoa. In the case of the former, it is quite unlikely that this structure is a Russian fort, because the location of such structures were well known, and there is a

Helber Haster
Planners

Ms. Jacquelin Miller
March 9, 2000
Page 3

proximal fort about 1/2 mile to the west and the structure does not conform to defense fortifications. In any event, there was no other evidence to suggest that such a use was made of the site. In the case of the star-shaped design, such a structure has been mapped in detail in Western Samoa, and the shape of the Kapalawai structure is not consistent with this design.

It is also highly unlikely that this structure is one of the heiau mentioned to Bennet, but not located by him. The absence of any midden, charcoal, and artifacts in the vicinity of the structure argue against such a theory. In spite of the foregoing discussion the developer intends to preserve the platform and establish a reasonable buffer around it to avoid damage and unwarranted intrusion by the public.

Traditional Customs and Practices Report. We apologize for the inaccurate use of diacritics and other Hawaiian terms that appear in the DEIS. These errors occurred as a result of the incompatibility of software which uses Hawaiian fonts, and the printing process. These errors will be corrected in the FEIS.

Tsunami Hazard. Only a small portion of the north-makai corner of the property is affected by tsunami hazard (VE zone). The remainder of the area subject to flooding lies within the AE zone. All structures within this area will comply with flood hazard requirements, including certification by an engineer.

Wastewater Systems and Drainage. You correctly point out that specific design elements for the wastewater treatment plant and drainage facilities are not included in the EIS. The detailed engineering required to provide these plans will be undertaken at a later stage of the design process, and will be reviewed by appropriate agencies as to their efficacy, including the Department of Health, and the County Department of Public Works. No building permits can be issued until these issues are resolved to meet very specific engineering and performance requirements.

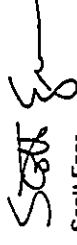
All appropriate precautions and best management practices will be utilized to minimize impacts related to sediments reaching receiving waters. Although drainage design features have not been specifically engineered, conceptual drainage plans do indicate areas of the property where runoff will be detained and allowed to settle before reaching the marine environment.

Helber Haster
Planners

Ms. Jacquelin Miller
March 9, 2000
Page 4

If you have any questions regarding this project, please call me at 545-2055.
Sincerely,

HELBER HASTER & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. BOX 128
KEKAHA, HAWAII 96752-0128

NO REPLY NEEDED TO
5090.11A
Ser 7031.5/0010
07 Jan 2000

County of Kauai
Department of Planning
Attn: Mr. Keith Nitta
4444 Rice St., Suite 473
Lihue, HI 96766

Gentlemen:

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE KAPALAWAI RESORT

Thank you for the opportunity to review the subject draft Environmental Impact Statement.

After review of the document, our operations and surrounding lands, Pacific Missile Range has concluded there will be no impact to our operations.

In light of our desire to continue as good neighbors in the West Kauai community, we offer the following specific comments: On page 1-8, paragraph 6, line 4, a new exit drive from the property is mentioned, but was not clearly identified in Chapter 6. On page 1-9 and page 4-48, grassing as a mitigation for fugitive dust control is not mentioned. Page 6-16, paragraph 2, line 1, "A right-turn deceleration lane is recommended on westbound Kaunaulii Highway at the entrance driveway for the Project for safety purposes and to minimize delays to through traffic." Should this read "left-turn" vice "right-turn"? Also, correct the spelling of the word "purposed".

If there are any questions regarding this matter, please contact Mr. Robert Inouye at 335-4632.

Sincerely,

BRIAN W. MOSS
Captain, U. S. Navy
Commanding Officer

Copy to:
Office of Environmental Quality Control
Destination Villages Kauai, LLC
Helber Hastert & Fee, Planners

Helber Hastert
Planners

March 9, 2000

Capt. Brian W. Moss
Commanding Officer
Department of the Navy
Pacific Missile Range Facility
P.O. Box 128
Kekaha, HI 96752-0128

Dear Capt. Moss:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 7, 2000 (5090.11A, Ser 7031.5/0010), on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

We note that you have concluded that the Kapalawai Resort will have no impact to your operations, and we appreciate your observations and recommended changes for the FEIS. These changes will be incorporated into the FEIS.

If you have any questions regarding this project, please call me at 545-2055

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

MARYANNE W. KUSAKA
MAYOR



WALLACE G. REZENTES, SR.
ADMINISTRATIVE ASSISTANT

CESAR C. PORTUGAL
COUNTY ENGINEER
TELEPHONE 341-8600

IAN K. COSTA
DEPUTY COUNTY ENGINEER
TELEPHONE 341-8600

AN EQUAL OPPORTUNITY EMPLOYER

COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MOI KEHA BUILDING, SUITE 275
LIHUE, KAUAI, HAWAII 96766

November 30, 1999

Mr. Dee Crowell, Director
Planning Department
4444 Rice St., Suite 473
Lihue, Hawaii 96766

Attention: Mr. Keith Niita

Dear Mr. Crowell:

SUBJECT: KAPALAWAI RESORT DEIS
TMK: 1-7-05: 01

We are offering our comments on the draft environmental impact statement for the captioned project per your request.

1. Response to our comments on the Environmental Impact Statement Preparation Notice mentions that flood studies conducted by Wagner Engineering Services for flood zones and elevation is to be included in its entirety in the DEIS. The response also mentions that all areas of the project affected by flooding will be identified in the DEIS.

Appendix I in the DEIS includes a summary of a Civil Engineering Report prepared by Wagner Engineering Services and is not considered complete nor acceptable "flood study in its entirety". Additionally, no other areas in the site have been identified that may be subject to flooding.

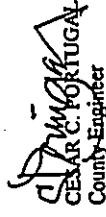
It may not be necessary to submit, review and accept the flood study at this time. However, we certainly hope that complete flood studies with hydrologic and hydraulic maps, data, and calculations will be submitted and accepted prior to developing any plans for structures and facilities especially next to watercourses.

Mr. Dee Crowell, Director
Planning Department
November 30, 1999
Page 2

2. The Civil Engineering Report in Appendix I, Flood Hazard, mentioned that structures constructed in the floodways must be elevated to or above the 100-year flood elevation. County of Kauai, Flood Plain Management Ordinance prohibit development of the floodway zone which is reserved to convey the regulatory flood. No structures, fills, or encroachment of any obstructions should be proposed in the floodway zone.
3. The DEIS includes a preliminary drainage plan that proposes onsite drainage system that will drain into Hoanuanu Bay and Mahaikona Stream. Our concern would be the discharge of sediments and other pollutants directly into the stream and ocean. We believe that measures to minimize discharge of sediments and other pollutants into the stream and ocean must be proposed and implemented. Additionally, permits from other Agencies are required for structures in or at the stream and beach.

Thank you for the opportunity to offer our comments.

Very truly yours,


CESAR C. PORTUGAL
County Engineer

KK/cu

cc: OEQC
Destination Villages of Kauai, LLC
Helber Haester & Fee, Planners

March 9, 2000

Mr. Cesar C. Portugal, County Engineer
County of Kauai
Department of Public Works
4444 Rice Street
Mo'ikeha Building, Suite 275
Lihue, HI 96766

Dear Mr. Portugal:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated November 30, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. **Drainage Study.** The report prepared by Wagner Engineering Services for the DEIS should be identified containing a summary of the results of a "Preliminary Drainage Study," and is not, as you point out, a complete flood study. This report, which appears as Appendix I, will be correctly referenced in the FEIS. You also point out that a complete flood study, with hydrologic and hydraulic maps, data, and calculations should be accepted prior to developing any plans for structures and facilities. We pledge that this work will be completed in a timely manner.
2. **Areas Subject to Flooding.** You note that no additional areas within the project site have been identified affected by flooding (comparing the EISPN to the DEIS). Figure 20 in the DEIS identifies the flood hazards affecting the property. The areas identified as "Zone X," "Zone AE" are found on the Flood Insurance Rate Map, Community Panel 150002 0160D (September 30, 1995). The areas identified with cross-hatching are the result of the Preliminary Drainage Study prepared by Wagner Engineering Services. These are the "additional" areas we referred to.
3. **Floodways.** The DEIS and the Civil Engineering Report incorrectly identify certain areas as "floodways." These areas should be identified as

Mr. Cesar C. Portugal
March 9, 2000
Page 2




"flood fringe." The report and Section 4.11 of the FEIS will be amended accordingly.

4. **Discharge to Streams.** We share your concern about the discharge of sediments and other pollutants directly into the stream and ocean. At this time, we are considering several best management practices (BMPs) that would mitigate potential impacts to streams and the ocean. These include: grass channels; filter strips; and bio-retention areas. Other more direct options such as sand filters will also be considered. Selection of final BMPs, which could include a combination of those listed, will be made at the time of detailed design for the project. Section 6.4 of the FEIS will include identification of these BMPs. We acknowledge that permits from other agencies are required for structures in the vicinity of streams. We do not intend to design structures in or near the ocean.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELPER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geysler, Destination Villages Kauai, LLC

January 4, 1999

Keith Nitta
Kauai Planning Commission
Re: Kapalawai resort

I wish to express several concerns regarding the proposed Kapalawai Resort on Robinson property near Waimea.

1. The proposed number of units.
2. The failure to include facilities for local residents that enjoy the Pakala beaches.
3. The modification of the environment to the detriment of the very rare Hawaiian Bat.
4. The probable existence of native Hawaiian sites on the property.
5. The preservation of the fishpond on the property.

COUNTY OF KAUAI

Regarding #1 the proposed number of units seems out of line when considering the recreational and visitor facilities on this side of the island. The number of units should be reduced to lessen the impact of people and automobiles in the area. While there appears to be plenty of open space much of it is unavailable for public use. The two lane highway, already crowded, during certain periods of the day may become another Kapa'a nightmare with an additional 250 cars, one car per cabin, that the resort could add.

If both Waimea Plantation and Kapalawai are projected to be 70% occupied what is to prevent the mainland type of development similar to Kapa'a and Hanalei to service the needs of these visitors.

Concerning #2: If the proposed resort can provide amenities to so many guests I would hope that they also feel obliged to enhance the experience of island residents and neighbors who have been using this beach for years. Providing a dedicated beach access, a parking lot, shower and toilet facilities, at the Hanapepe end of the property could do this.

Beach access along Akukui Stream to Hakaweli Landing has been used for years with vehicle parking along Kaunualii highway. The lack of off street parking creates a very dangerous situation. Traffic along this stretch of the highway is always doing at least the posted 50-mph if not more. As it is now people are limited to a narrow strip on either side of the highway to unload their families and beach toys. Traffic approaching this area has a limited view of people crossing the highway and a limited area in which to react if a problem should develop in or along the highway. This is compounded by the variety of large trucks

that use this portion of the highway. On a nice summer day as many as 40 vehicles might be parked along the road, some spending as long as several hours at the beach and others coming and going every 15 minutes. People are now forced to shower, change clothes and organize themselves along this narrow strip prior to going to and coming from the beach. It doesn't take much of an imagination to see a car swerving to avoid a child or dog and crashing into cars and people by the highway.

A dedicated beach access with toilet and showers would eliminate a health problem. As it is now there are no toilets here and people use the pasture and woods to relieve themselves. The closest public restroom is at the Russian Fort. With the addition of a sewer treatment facility on the property a public toilet and shower would be a welcome addition for local residents.

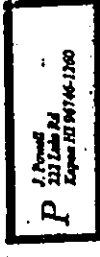
Point #3 concerning wildlife in the area. I have only read that the Hawaiian Bat was observed in the area. But I have seen the Black-Crowned Night-Heron feeding along the streams that cross the property. Efforts should be made to insure that this majestic and solitary, indigenous bird continue to be a resident in the area.

In addressing point #4 while the majority of the area may have been altered by agricultural activities evidence of Hawaiian sites may still exist below the surface. It is well known that Hawaiians buried their dead in sand and it appears that this coastal area is entirely sand. I would hope that the state would require archaeological monitoring of construction activities that might impact burials and sites below the surface.

The pre-historic fishpond on the property should be considered a monument to Hawaiian environmental engineering skills. Its reconstruction will be expensive and time consuming. But its completion will provide a vital focal point to understanding the lifestyles of ancient Hawaiians on this side of the island. Its restoration in a timely manner should be a condition for granting permits for the resort.

In conclusion, I feel that my concerns are legitimate and if addressed a compromise could be reached that would allow visitors, residents and birds to safely enjoy this unique area. Please do your best while discussing this matter to consider everyone's needs.

James Powell
222 Lulo Rd.
Kapa'a, HI
823-6892



Helber Hastert
Planners

March 9, 2000

Mr. James Powell
222 Lulo Road
Kapaa, HI 96746-1260

Dear Mr. Powell:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 4, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

Proposed number of units. The overall density of the proposed resort is approximately 1.5 visitor units per acre, which is a low density for a resort project. As you note in your letter, the completed development will enjoy a significant amount of open space. The development will provide access opportunities to the shoreline and the fishpond for the public.

In regard to traffic, a traffic impact report was prepared for the project by Wilbur Smith Associates, and is attached to the EIS as Appendix H. The findings of their report do not indicate significant impacts to traffic flow along Kaunualii Highway. Recommendations to mitigate traffic impacts include construction of a left-turn storage lane for vehicles turning into the property travelling in a northerly direction (toward Waimea), and a right-turn deceleration for vehicles entering the property travelling in a southerly direction (toward Hanapepe).

You also suggest that the resort will encourage "mainland type of development." Kapalawai Resort is intended to complement the character of West Kauai. Any new development in the region will require review by the County of Kauai Planning Department, and public hearings for community input. The character of Kauai is important to all its residents. Any new development should, and must, be reviewed in the context of design suitability.

Beach access/facilities. As stated in #1, above, the proposed resort will provide public access to the shoreline. Access adjacent to Aakukui Stream is of particular importance because it is now the only means of public access to the



Helber Hastert
Planners

Mr. James Powell
March 9, 2000
Page 2

shoreline through the property. The developer will be working with the West Kauai community to determine appropriate support facilities in this area, including parking, restrooms, and showers.

Wildlife. The Kapalawai Resort will not limit habitat for either the Hawaiian Hoary Bat or the Black-crowned Night-Heron. In fact, restoration of the fishpond and regular maintenance of the two streams that flow through the project site will actually provide additional habitat for these species.

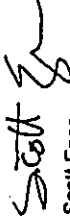
Archaeological monitoring. Your suggestion to require archaeological monitoring during construction is a good one, and we wholeheartedly support it. We expect that this requirement will be included as a condition of approval in most, if not all, land use permits for the project.

Fishpond. We also agree with your observations concerning the fishpond. The developer is committed to the enhancement and preservation of the fishpond, and recognizes its historic importance.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners


Scott Ezer

Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

11-11-99 10:00 AM 11-11-99 10:00 AM 11-11-99 10:00 AM 11-11-99 10:00 AM 11-11-99 10:00 AM

BENJAMIN J. CAYetano
Director



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

214 SOUTH BONTANA STREET
SUITE 192
HONOLULU, HAWAII 96813
TELEPHONE: (808) 541-1111
FACSIMILE: (808) 541-1119

GENEVIEVE SALMONSON
DIRECTOR

December 15, 1999
Dee Crowell
Page 2

Dee Crowell
Kauai Planning Department
4444 Rice Street, #473
Lihue HI 96766

Attn: Keith Nitta
Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement (EIS) for Kapalawai Resort,
Makaweli, West Kauai

We have the following comments to offer.

1. Permits and approvals: Section 1.7 lists permits and approvals but a timetable indicating status, submission dates or expected submission dates needs to be included.
2. Regional perspective: In the final EIS give a brief description of the area from a regional perspective. This would include a discussion of the physical, economic and social conditions.
3. Related projects: Mention is made of a high technology center and a seed corn operation in Waimea. The Ceatech Shrimp Farm is another recent, and very large, Waimea project. Include a discussion and analysis of the cumulative impacts of Kapalawai and of these and any other projects in the area.
4. Unavoidable adverse effects: In a separate section, give a brief discussion of all adverse effects which are unavoidable.
5. Figure 13: This figure, *Detailed Land Classification*, needs a legend.

December 15, 1999

6. Recycling: According to Article 7 (Landfills), Section 21-7.3 (Prohibited Materials) of the Kauai County Code, the following materials from non-residential sources are not allowed:

- corrugated cardboard;
- ferrous and non-ferrous metal objects;
- loads with more than 20% greenwaste; and
- liquid waste.

In the final EIS, indicate the recycling program that will be put into effect, considering the above restrictions.

If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,

GENEVIEVE SALMONSON
Director

Enc.

- c: Scott Ezer, Heiber Hastert & Fee
- Lewis Geyser, Destination Villages Kauai

Helber Hastert
Planners

Ms. Genevieve Salmonson
March 9, 2000
Page 2



March 9, 2000

Ms. Genevieve Salmonson, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Dear Ms. Salmonson:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated December 15, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. Permits and approvals. Section 1.7 will be amended to include information indicating status and (expected) submission dates for the respective permits.
2. Regional perspective. Section 2.1 will be amended to include a brief description of the area from a regional perspective.
3. Related projects. The Ceatech Shrimp Farm began operations in 1998 and has increased its operations to about 100 acres and 45 employees. It's characterization as a "very large" project is not accurate, at this time. Certainly the company has the potential for further growth, but that potential must be realized with production increases and management stability.
4. Unavoidable adverse effects. A separate section will be added to the FEIS (1.10) that includes a brief discussion of adverse effects that are unavoidable.
5. Figure 13. Figure 13 will be amended to simplify its information content for easier interpretation.

6. Recycling. The FEIS will discuss the recycling program in the context of Article 7 (Landfills), Section 21-7.3 (Prohibited Materials) of the Kauai County Code.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners

Scott Ezer

Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

MARYANNE W. KUSAKA
MAYOR



VIRGINIA M. KAPALI
DIRECTOR

COUNTY OF KAUAI
OFFICE OF ECONOMIC DEVELOPMENT
4444 Rice Street, Suite 302, Lihue, Hawaii 96766
TEL: 808-311-6280 FAX: 808-311-6289

Mr. Dee Crowell
Attn: Keith Niita
Page 2
December 30, 1999

December 30, 1999

Mr. Dee Crowell
Planning Director
4444 Rice Street, Suite 473
Lihue, HI 96766

ATTN: Keith Niita, Planner

RE: Kapalawai Resort - Draft Environmental Impact Statement, October 1999

This is in response to the request for comments to the DEIS for the Kapalawai Resort project. As the County's Energy Coordinator, I have been an advocate for the use of energy conservation and efficiency practices, as well as the use of renewable energy in new and existing projects. In reviewing the DEIS, I have the following comments that relate specifically to energy use at the resort:

1. Solar Energy

West Kauai is blessed with the highest daily solar insolation on the island. The project area is ideal for solar hot water heating and photovoltaic-powered lights that should be considered as it relates well to the ecotourism concept.

2. Heat Gain Reduction

The abundant solar resource is a double-edged sword because it also creates a need for cooling. Natural ventilation, fans, appropriate building materials, exterior colors and landscaping can reduce heat gain and have been mentioned in previous comments. Other technologies such as solar roof fans and ceiling/roof insulation to reduce heat gain in the buildings should be considered in the building design's life cycle cost analysis.

3. Proper Equipment Design

The pumps and motors for the water and wastewater treatment plants and supporting infrastructure should not be over-designed. In past pump and motor efficiency workshops conducted on Kauai, experts from the U.S. Department of

Energy's Motor Challenge Program concluded that a large number of existing pumping systems around the country have been over-designed to offer engineers a safe margin of error, in terms of operational capacity. New and improved technologies, including variable speed motors, control systems and new diagnostic software have made pump optimization more of an exact science. Designing pumping systems closer to actual requirements will save energy and reduce overhead costs, thus making the project more economically viable.

Please call me at (808) 241-6393 if you have any questions regarding my comments.

Sincerely,

Glenn H. Sato

Glenn H. Sato

Copy: Virginia Kapali, OED Director
Office of Environmental Quality Control
Lewis Geyser, Destination Villages Kauai, LLC
✓ Scott Ezer, Helber Hastert & Fee, Planners

Helber Haster
Planners

March 9, 2000

Mr. Glenn H. Sato
County of Kauai
Office of Economic Development
4444 Rice Street, Suite 200
Lihue, HI 96766

Dear Mr. Sato:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated December 30, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

We appreciate your comments regarding the potential to incorporate energy conservation and efficiency practices, as well as renewable energy technologies to achieve energy savings at the proposed Kapalawai Resort. You will be pleased to know that Mr. Mike Nelson, Vice President of Destination Villages Kauai, LLC (the applicant), has a bachelor's degree in Environmental Engineering and 10 years professional experience with the use of alternative energy solutions. Mr. Nelson intends to maximize these opportunities at Kapalawai.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTER & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

FRIENDS OF PRESERVE PUA'ENA POINT, INC.
c/o Warren W. Scoville (Co-Chair)
61-795 Malua Rd.
Malua HI 96712

January 2000

County of Kauai, Planning Dept.
Attn: Mr. Keith Nitta
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

By FAX, to: (808)241-6699... (this page
(4) By First Class Mail (posted today)

RE: KAPALAWAI RESORT (Draft E.I.S.) --

Dear Mr. Nitta,

I'm pleased to read that the Applicant/Developer, Mr. Lewis Geyser, and the Consultant/Planner, Mr. Scott Ezer, appear to be properly forthcoming with their requests, applications, Environmental Impact Statements, etc., for their Kapalawai Resort project.

This is a pleasant surprise compared to what they did (is are still) with their Pua'ena Eco-Camp project (located development formerly known as the Pua'ena Eco-Camp), here on the North Shore of Oahu.

Specifically, (1) They are calling their Kauai project a RESORT (which it actually is...just like their proposed project on Oahu). Although the proposed Kapalawai Resort is not a "camp" (as they chose to call their Oahu project) it is a "camp" because they know that a permitted use on the proposed Oahu site is Agricultural (AC-2).

(2) They are calling their overnight-cottages (which they actually ARE...just like the ones for their proposed project on Oahu). However, they had to call these structures "TRMS" (for which there is no definition in the Land Use Ordinance) because they know that Vacation CABINS, Transient Vacation Units, not Hotel (rooms/units) are permitted on AC-2 zoned land.

(3) They are actually requesting the project to be a "Special Management Area" (SMA) (which is a zoning amendment and a general plan amendment) although they should have requested a rezoning (such as AG-2) for their proposed Oahu development (as such as AG-2 zoning does not allow for a Resort (or hotel) operation, and the North Shore Sustainable Communities Plan ("Development Plan") does NOT envision a hotel/resort operation ANYWHERE on the North Shore of Oahu). They are STILL trying to have their Oahu project approved WITHOUT the proper AMENDMENTS (a change in the zoning to "Special Management Area" and an amendment (exception) to the North Shore's "Development Plan").

Finally, I sincerely hope that their various "informational meetings" with the neighboring communities on Kauai will be properly promoted/advertised and available to the ENTIRE community, especially to those who reside closest to the proposed development. If so, this would be quite different than the way they proceeded (and are still proceeding) with their dissemination of information about their proposed project on Oahu, where many of their community meetings were NOT publicized sufficiently and/or simply not known about by many of the neighboring residents.

Please send me a copy of the Final E.I.S. when it is available.

Sincerely,


Warren W. Scoville

Copies FAX'd to: Applicant (Mr. Lewis Geyser) @ (808)687-8206; Consultant (Mr. Scott Ezer) @ 545-2050; O.E.R. @ 585-4186; William W. Saunders, Jr. @ 533-2467

Helber Hastert
Planners

March 9, 2000

Mr. Warren Scoville
61-795 Papailoa Road
Haleiwa HI 96712

Dear Mr. Scoville:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 6, 2000 on the above draft environmental impact statement (DEIS). Your letter and this response will be included in the final environmental impact statement (FEIS) being prepared.

The balance of your letter deals with your comparison of the proposed resort at Kapalawai to another project planned by the developer at Kawaihoa on Oahu. There are no comments pertaining to specific points or information contained in the DEIS for the Kapalawai project. We respectfully submit that any comments or questions you have concerning the proposed development on Oahu are inappropriate and not relevant to the consideration of the DEIS for this project, and should be addressed to appropriate agencies with jurisdiction on Oahu.

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



MARYANNE W. KUSAKA
Mayor

DAVID Y. SPROAT
Fire Chief

COUNTY OF KAUAI
FIRE DEPARTMENT
MOTERUA BUILDING
444 RICE STREET, SUITE 205
HALEIWA, KAUAI, HAWAII
DEC - 3 P.M.
MOTERUA BLDG.

December 2, 1999

Kedih Niina
Planning Department
County of Kauai
4444 Rice St., Suite 473
Lihue, Hawaii 96766

RE: Fire Department Comments
Kapalawai Resort - DEIS
Waimoa, Kauai, Hawaii

Appendix J - Pages 9 & 10 - Elements of the Potable Water System:

The Applicant proposes to construct a nominal 200,000 gallon (0.2 million gallon) storage tank for the private water system which would be used to supply the maximum daily use consumption as well as the required fire protection for the RR-10 zoning per Department of Water requirements (minimum of 1500 GPM for 2-hours duration). The tank was so sized following two criteria: (1) The volume must be equivalent to the maximum daily use without credit for inflow from the well pump; and, (2) The volume must provide the maximum day rate plus fire flow for the duration of the fire with the reservoir 1/2 full at the start and credit for well inflow. The maximum daily use is estimated to be 0.177 MG.

The Applicant's storage requirement of 172,550 gallons is substantially less than our calculations assumed by their data. The formula for calculating Storage Volume is:

$$V = 4/3 T_f (Q_m + Q_f - Q_p)$$

V = required storage volume, mill. gal.
 T_f = fire duration, day (2-hours/day = 0.083)
 Q_m = maximum day demand, mgd (177 mg)
 Q_f = fire flow, mgd (1500 gpm = 2.16 mgd)
 Q_p = pump input, mgd (200 gpm @ 16-hours = .192 mgd)
(200 gpm @ 24 hours = .288 mgd)

Heller Institute
Fire Department

March 9, 2000

Mr. David K. Sproat, Fire Chief
Fire Department
County of Kauai
4444 Rice Street, Suite 295
Lihue, HI 96765

Dear Chief Sproat:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter of December 2, 1999 on the above draft environmental impact statement preparation notice (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. **Storage Tank Capacity.** Based on the calculations presented in your letter, we acknowledge a storage tank requirement of approximately 0.3 million gallons.
2. **EISPN Comments.** As we stated in our letter of November 5, we appreciate all of your comments concerning appropriate design considerations, landscape requirements, and recommended building setbacks. We believe these issues will be most appropriately addressed during the review of detailed plans for the project. At this time, the project design is at more of a conceptual level. We hope to work closely with the Fire Department during the design of these detailed plans.
3. We agree with your recommendation that the fire alarm system shall be incorporated into the Museum and other major structures, to further protect and preserve historic resources.

The Applicant sized the storage tank at 200,000 gallons, which is approximately 16% larger than their calculated value of 172,550 gallons. Our calculations on the other hand resulted in the following:

Assuming 24-hour pump operations: $V = 226,700 \text{ gals.} + 16\% = 263,000 \text{ gallons}$
Assuming 16-hour pump operations: $V = 237,300 \text{ gals.} + 16\% = 275,268 \text{ gallons}$

Therefore, storage tank capacity should be a minimum of 0.275 MG or may be rounded to 0.3 MG rather than the 0.2 MG as reported. The private water system shall comply with the installation/testing/maintenance standards of NFPA 22, Water Tanks for Fire Protection; NFPA 24, Private Fire Service Mains; NFPA 25, Water-Based Fire Protection Systems; and the appropriate installation/testing/maintenance standards of the County Department of Water; State Department of Health, etc.

Other than the above, we have found no other representation in the DEIS that addresses or resolves the other areas of concern as described in our comments reply dated 08/18/99. We await review of the Applicant's proposal to incorporate these features into detailed plans.

In addition, the fire alarm system for the cottages shall be incorporated into the Museum Building and other major structures. We also recommend that the Museum be fire sprinklered to further protect and preserve the historical structure.

Sincerely,


David K. Sproat
Fire Chief


Mike Kano, Captain
Fire Prevention Bureau

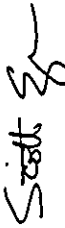
Helmer Hastert
Planners

Chief David K. Sproal
March 9, 2000
Page 2

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBER HASTERT & FEE, Planners


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



BEULAH J. CARTER
GOVERNOR

ESTHER UEDA
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

December 6, 1999

Mr. Dee Crowell
Planning Director
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement (DEIS) for
Kapalawai Resort, Kapalawai, Kauai, Hawaii

We have reviewed the DEIS for the subject project and have
the following comments:

- 1) The timeframe for obtaining the various Federal, State, and County land use entitlements should be clarified.
- 2) Pages 5-4 to 5-5 reference a market study prepared by Mikiko Corporation dated June 1999 in connection with a discussion on the economic impacts from the project. We suggest that said study be included in the Final EIS.
- 3) Clarification should be provided regarding the social impacts generated from the project upon the neighboring communities, the region, and the island as a whole. Was a social impact assessment prepared? If so, it should be included in the Final EIS.
- 4) We suggest that a boundary interpretation request be submitted to our office upon certification of the current shoreline. An interpretation based on a valid

Mr. Dee Crowell
December 6, 1999
Page 2

Heller Hartford
Hawaii

certified shoreline survey would more precisely determine the location of the Agricultural/Conservation District boundary along the property's shoreline and clarify the specific area of the boundary amendment petition that will be filed with our office in the future.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the DEIS.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,



ESTHER UEDA
Executive Officer

EU:aa

cc: OEQC
Lewis Geyser
Scott Ezer ✓

March 9, 2000

Ms. Esther Ueda, Executive Officer
State of Hawaii
Department of Business, Economic Development & Tourism
Land Use Commission
P.O. Box 2359
Honolulu, HI 96804-2359

Dear Ms. Ueda:

Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated December 6, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. Section 1.7 of the EIS will be amended to include estimated timetables for the various required entitlements.
2. The market study prepared for the Kapalawai Resort by Mikiko Corporation will be submitted to the Land Use Commission as an exhibit to accompany the boundary petition for the project.
3. Various elements which are found as part of a social impact assessment are included in the Economic and Financial Impact Assessment (prepared by Mikiko Corporation) and the Traditional Customs and Practices Assessment (prepared by Cultural Surveys Hawaii), and are discussed in Chapter 5 of the EIS. An issues analysis will also be prepared and submitted as an exhibit to accompany the boundary petition for the proposed project.
4. In a July 28 letter (with attached map), you delineated an approximate location for the State Land Use Agricultural/Conservation District boundary. You also indicated that a more precise boundary determination would require a valid certified shoreline survey of the property. Since that time, we have submitted the certified shoreline to your office, and the boundary interpretation has been completed.



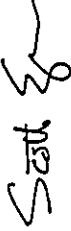
Helbert Hastert
Planners

Ms. Esther Ueda
March 9, 2000
Page 2

If you have any questions regarding this project, please call me at 545-2055.

Sincerely,

HELBERT HASTERT & FEE, Planners



Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC

COLLEEN J. CAVETANO
DIRECTOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

January 28, 2000

IN REPLY REFER TO
STP 8.9392

KAZUHIYASHIMA
DIRECTOR
COUNTY ENGINEER
COUNTY PLANNING
DEPARTMENT
GLENN H. ODAKOTO

Mr. Dee M. Crowell
Director
Department of Planning
County of Kauai
Suite 473, Building A
4444 Rice Street
Lihue, Hawaii 96766

Attention: Keith Nitta

Dear Mr. Crowell:

Subject: Kapalawai Resort
Draft Environmental Impact Statement (DEIS)
TMK: (4) 1-7-05: 01

Thank you for your transmittal requesting our comments on the subject project.

Our comments are as follows:

1. The proposed two one-way driveways should be consolidated into one two-way driveway. The consolidated access should have a channelized intersection with left-turn storage lane and acceleration and deceleration lanes. The costs of the improvements should be borne by the developer.
2. Drainage improvements should be provided at the existing box culvert crossing Kaunualii Highway.
3. The Kauai Long Range Land Transportation Plan includes widening of Kaunualii Highway from two to four lanes. The developer will need to coordinate the setback requirements for roadway widening with our Highways Division. In addition, the right-of-way should be notated as being "No Access Permitted" except at existing driveways.


Mr. Dec M. Crowell
Page 2
January 28, 2000

STP 8.9392

4. Plans for construction work within the State highway right-of-way must be submitted for our review and approval.

We appreciate the opportunity to provide comments.

Very truly yours,


KAZU HAYASHIDA
Director of Transportation

c: Mr. Lewis Geyser, Destination Villages Kauai, LLC
Mr. Scott Ezer, Helber Hastert & Fee, Planners
Ms. Genevieve Salmonson, OEQC

Helber Hastert
Planners

March 9, 2000

Mr. Kazu Hayashida
Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Hayashida:

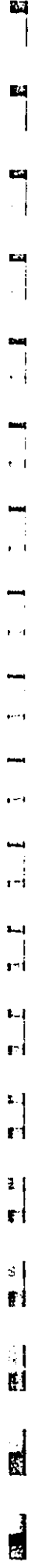
Draft Environmental Impact Statement
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Thank you for your letter dated January 28, 1999 on the above draft environmental impact statement (DEIS). Your letter will be included in the final environmental impact statement (FEIS) being prepared.

For your ease of reference, we will respond to your comments in the order they appear in your letter.

1. We note your comment suggesting that the proposed two one-way driveways be consolidated onto one two-way driveway. We look forward to working with your department to develop appropriate ingress/egress solutions for the resort.
2. We acknowledge the need to provide improvements at the existing box culvert crossing Kaunualii Highway.
3. We will work closely with your Highways Division to coordinate the setback requirements for any future widening of Kaunualii Highway.
4. We understand that all plans for construction work within the State highway right-of-way must be submitted to the Department of Transportation for review and approval.

Helber Hastert
Planners
1100 Kalia Road
Honolulu, Hawaii 96813



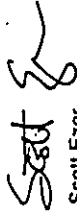
Helber Haster
Planners

Mr. Kazu Hayashida
March 9, 2000
Page 2

If you have any questions regarding this project, please call me at 545-2055.

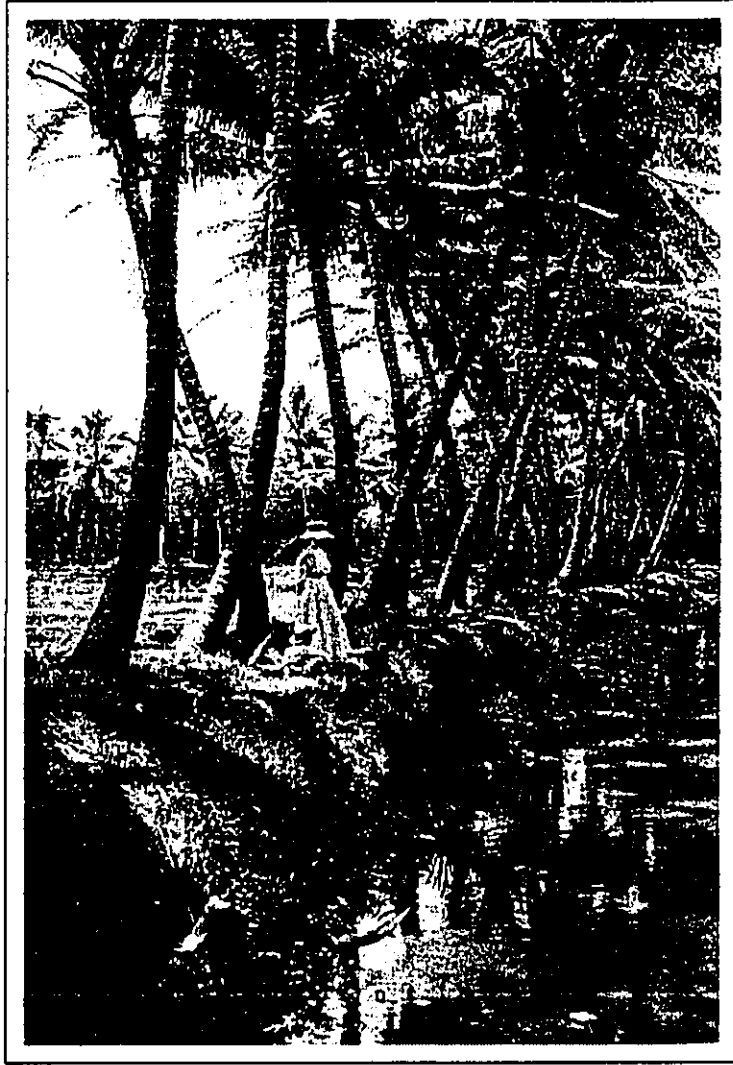
Sincerely,

HELBER HASTERT & FEE, Planners

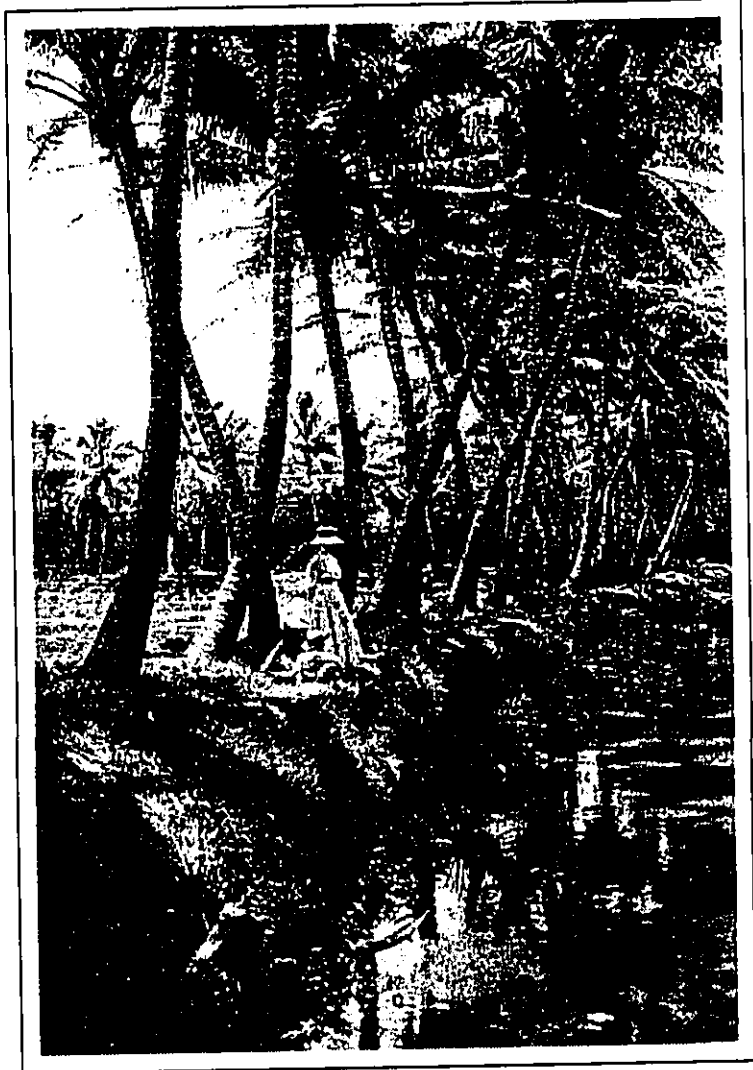


Scott Ezer
Senior Associate

cc: Dee Crowell, Kauai County Planning Department
Lewis Geyser, Destination Villages Kauai, LLC



APPENDICES



A

BOTANICAL SURVEY
CHAR & ASSOCIATES

BOTANICAL SURVEY
KAPALAWAI RESORT
KAPALAWAI, WAIHEA DISTRICT, KAUAI

BOTANICAL SURVEY
KAPALAWAI RESORT
KAPALAWAI, WAIHEA DISTRICT, KAUAI

by

Winona P. Char
CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawaii

INTRODUCTION

The proposed Kapalawai Resort consists of about 170 acres of land located makai of Kaunali'i Highway, near Waimea Town. It is bounded by the ocean to the south, Kaunali'i Highway to the north, A'akui Stream to the east, and agricultural lands (hybrid seed corn and sunflower fields) to the west.

Destination Villages Kauai, LLC proposes to construct a 250 unit resort on the site. The proposed project would consist of individual stand-alone and/or duplex type units scattered throughout the Kapalawai site. The former Robinson family residence, built around 1897, would be refurbished and serve as the focal point of the resort. The resort will also offer dining, swimming pools, tennis courts, a croquet lawn, and other activities and amenities for its guests.

Field studies to assess the botanical resources found on the Kapalawai project site were conducted on 06 to 08 March 1999 by a team of three botanists. The primary objectives of the survey were to:

- 1) describe the vegetation on the site;
- 2) inventory the flora;
- 3) search for threatened and endangered species as well as species of concern; and
- 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

Prepared for: HELBER HASTERT & FEE

April 1999

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area.

Topographic maps and soil maps as well as a colored aerial photograph (1" = 300') were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

A walk-through (pedestrian) survey method was used. Notes were made on plant associations and distribution, substrate types, drainage, exposure, disturbances, topography, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium (Bishop Museum), and for comparison with the recent taxonomic literature.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey.

A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual plants.

DESCRIPTION OF THE VEGETATION

The vegetation on the Kapalawai site is dominated by introduced or alien plants. This is not surprising as the site was the primary residence of the Robinson family at one time. Old family photographs show the property extensively landscaped and maintained (S. Ezer, pers. comm.). Portions of the site were used for employee housing, stables and corrals, fruit orchards, and vegetable gardens. Kapalawai Fish Pond provided water for much

of the landscaped areas; the old pump and siphon can be found on the mauka end of the fish pond. A Portuguese bread oven is also found near the pond. Throughout the property, there are massive, old thickets of the purple-flowered bougainvillea (Bougainvillea speciosa) and remnant patches of other ornamental species.

Today, the majority of the site is covered by scrub vegetation which is used for grazing cattle. Wetland vegetation is found along the two streams (Mahaikona and A'akukul) which cross the site, in and around the fish pond, and in a low lying spot where irrigation runoff water from the agricultural fields mauka of the highway is diverted. A very narrow band of coastal vegetation is found behind the white sand beach on the seaward side of the property.

A more detailed description of the three vegetation types follows. An inventory of all the plants found during the field studies is presented in the checklist at the end of the report.

The former Robinson family residence, employee housing, and other actively maintained areas near the northwest corner of the property were not included in the survey. These areas were not expected to harbor remnant native plant-dominated communities.

Scrub Vegetation

This vegetation type is basically open to closed canopy kiawe (Prosopis pallida) scrub forest with scattered shrubs such as lantana (Lantana camara), hairy abutilon (Abutilon grandifolium), and koa haole (Leucaena leucocephala), and patches of Guinea grass (Panicum maximum) and buffelgrass (Cenchrus ciliaris). There are several variants of this vegetation type, depending primarily on how recent the disturbance and to a lesser degree on substrate type.

Much of the area covered by scrub vegetation and identified as Fall land, "Fd", on the soil maps (Foote et al. 1972) has recently been opened up. These sections support patches of grasses and mostly weedy annual species; scattered about are large, old trees of kiawe, 'opiuma (Pithecellobium dulce), and monkeypod (Samanea saman) which have been left standing. Commonly observed plants on these areas include swollen fingergrass (Chloris barbata), buffelgrass, Guinea grass, spiny amaranth (Amaranthus spinosus), lion's-ear (Leonotis nepetifolia), 'aheahea (Chenopodium murale), coffee senna (Senna occidentalis), and cocklebur (Xanthium strumarium). Golden crown-beard (Verbesina encelioides), a member of the daisy family with large yellow flowers and up to 2 ft. tall, is locally abundant. Large patches of barren soil are also common.

Along the makai perimeter of the property, there is a dense band of kiawe and 'opiuma trees which have not been disturbed. In this area there are scattered groves of coconut (Cocos nucifera) and date (Phoenix sylvestris) palms, and small stands of milo trees (Thespesia populnea). Lantana (Lantana camara) and wild basil (Ocimum gratissimum) shrubs are locally common under the trees.

In the area between the two streams, the scrub vegetation consists of rather dense stands of 'opiuma trees, 6 to 20 ft. tall. Scattered about are older kiawe trees, 25 to 40 ft. tall and 2 to 3 ft. in diameter. The soil in this area is Jaucus loamy fine sand, 0 to 8% slopes; "JfB" on the soil maps (Foote et al. 1972). Bermuda grass or manienie (Cynodon dactylon) and buffelgrass form extensive patches on this sandy substrate. Shrubs of 'ilima (Sida fallax), a native species with orange flowers, are also common.

Along the western portion of the property is an area with much surface stones, mapped as Nonopahu stony clay, "NOC", 2 to 12%

slopes (Foote et al. 1972). This area has not been cleared and supports a closed canopy kiawe forest with Guinea grass understory.

Along the mauka portion of the property on soils of the Makaweli series ("MgC, MgB, MhC"), the scrub vegetation, in places, is composed of koa haole thickets, 12 to 15 ft. tall, with a ground cover of dense Guinea grass clumps up to 3 ft. tall. There are also areas with open kiawe and Guinea grass scrub. These areas with Makaweli soils often have a few large trees of mango (Mangifera indica), Java plum (Syzygium cumini), Chinese banyan (Ficus microcarpa), monkeypod, royal palm (Roystonea sp.), and many large thickets of bougainvillea. There is also a large patch of the spineless or cochineal cactus (Opuntia cochenillifera) near the dirt road which accesses the employee's housing.

Wetland Vegetation

The banks of Mahaikona and A'akukui streams are well-defined with no low lying overflow areas. The top of the stream banks support scrub vegetation. Along the bottom banks, next to the water's edge, there are mats of California grass (Bracharia mutica) and shrubs of Indian pluchea (Pluchea indica). Wetland vegetation is denser and more varied along A'akukui Stream especially in the area just behind the beach. There are dense mats of California grass and thickets of Indian pluchea as well as clumps of bulrush or kaluha (Schoenoplectus californicus) -- up to 7 ft. tall, umbrella sedge (Cyperus alternifolius), and Napier grass (Pennisetum purpureum). Further upstream, honohono (Commelina diffusa) is locally common.

A grove of coconut trees lines the perimeter of Kapalawai Fish Pond. Along the north side of the pond, there are dense thickets of purple and rose-red (Bougainvillea glabra) bougainvillea. Bulrush, 3 to 12 ft. tall, has filled in most of the pond. A few

open water areas are found mostly along the north side of the pond. These patches of open water support California grass along their margins and floating aquatics such as water hyacinth (Eichhornia crassipes) and duckweed (Lemna aquinoctialis). The drainage canal which runs from the pond to the beach is covered by dense floating mats of water hyacinth and water lettuce (Pistia stratiotes).

The low lying area where water from the fields mauka of the highway are directed supports dense clumps of umbrella plant, 2 to 4 ft. tall, and standing water 6 inches to about a foot deep. Job's tears (Coix lachryma-jobi), and primrose willow or kamole (Ludwigia octovalvis) are locally abundant. Along the northern half of the low lying area, there are low, open, grassy patches of Bermuda grass with scattered plants of primrose willow, false daisy (Eclipta prostrata), green kyllinga (Kyllinga brevifolia), honohono, and jungle rice (Echinochloa colona). A few mats of the aquatic azolla fern (Azolla filiculoides) are found in the areas with small pools of water. There are a few large trees in and around the low lying area, some of which have died back due to the water-logged soils and anaerobic conditions.

Coastal Vegetation

A white sand beach is found along most of the shoreline on the Kapalawai project site. There is a small rocky section along the southwest corner, where it nears the agricultural fields. The narrow band of coastal vegetation is composed primarily of pohuehue or beach morning glory vine (Ipomoea pes-caprae), Bermuda grass, and 'aki'aki or beach dropseed grass (Sporobolus virginicus). Scattered here and there are low, windswept clumps of koa haole shrubs and trees of kiawe, 'opiuma, and milo.

Unfortunately, a long-spined algaroba or mesquite species, Prosopis juliflora, has become established in the coastal vegetation. This sprawling large shrub to medium-sized tree has thick spines up to 2 inches long. Several large plants on the site had numerous clusters of pale yellowish brown pods. A number of saplings were also found. No plants were observed inland of the coastal vegetation.

DISCUSSION AND RECOMMENDATIONS

The 170-acre Kapalawai project site has been disturbed for a long period of time. The Robinson family home was constructed around 1897 and the site was extensively landscaped. Remnant plantings of ornamental species are commonly encountered throughout the site. Almost all of the property appears to have been managed by human activity during some point in time.

A total of 145 plant species were found during the field studies. Of these, 130 (89.6%) are introduced or alien species. Introduced plants are all those species which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778. Two plants (1.4%) are originally of Polynesian introduction and 13 plants (9%) are native. Of the natives, 12 are indigenous, that is, they are native to the islands and elsewhere, and one is endemic, that is, it is native only to the islands. The one endemic is the kupala (Sicyos af. pachycarpus), a member of the gourd or squash family.

None of the plants inventoried on the site is a threatened and endangered species; nor is any plant a species of concern (U.S. Fish and Wildlife Service 1999). All of the plants can be found

in similar environmental habitats throughout the Hawaiian Islands.

Improvements to the Kapalawi Fish Pond are planned. This would create more open water areas for the endangered Hawaiian water-birds which use the pond. The irrigation runoff water which is being diverted into the low lying area on the property will cease when a reservoir mauka of the highway is constructed sometime soon. Once the water flow has been discontinued, wetland vegetation is expected to die back and be replaced by scrub vegetation.

From a botanical perspective, the large numbers of Prosopis juliflora plants are of primary concern. To date, the plants have only been known from O'ahu at Sand Island and vicinity (Wagner et al. 1990). Their appearance and somewhat prolific reproduction on Kaua'i is troubling. If not eradicated, the plants could form large, impenetrable, spiny thickets in low land, dry habitats throughout Kaua'i. Slippers, boots, and tires are no match for the numerous, thick spines up to 2 inches long.

It is recommended that all plants be eradicated -- cut and burned on site. Stumps should be treated with herbicide to prevent resprouting. The areas where the plants were found should be periodically checked for any seedlings which might appear. A search should also be made of the adjacent shoreline properties for additional plants.

LITERATURE CITED

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PLANT SPECIES LIST -- Kapalawai Resort

The following checklist is an inventory of all the plants observed on the project site during the field studies. The plant names are arranged alphabetically by families within each of four groups: Ferns, Gymnosperms, Dicots, and Monocots. The taxonomy and nomenclature of the Ferns follow Lamoureux (1988), while the Gymnosperms are in accordance with Staples and Herbst (in prep.). The flowering plants, Dicots and Monocots, follow Wagner *et al.* (1990). The few recent name changes for the flowering plants are those reported in the Hawaii Biological Survey series (Evenhuis and Miller, eds., 1995-1998).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

E = endemic = native only to the Hawaiian Islands.

I = indigenous = native to the Hawaiian Islands and also elsewhere.

I? = questionably indigenous = data not clear if dispersal by natural or human-related mechanisms, but weight of evidence suggests probably indigenous.

P = Polynesian = plants originally of Polynesian introduction prior to Western contact, that is, Cook's discovery of the Hawaiian Islands in 1778.

P? = questionably Polynesian = may be a Polynesian introduction, or possibly introduced early in historical times (after 1778).

X = introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact.

X? = questionably introduced = dates of introduction very early; may possibly be indigenous or of Polynesian introduction.

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4. Presence (+) or absence (-) of a particular species within each of three vegetation types recognized on the project site (see text for discussion):

s = Scrub Vegetation

w = Wetland Vegetation

c = Coastal Vegetation

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<u>Scientific name</u>	<u>Common name</u>	<u>Status</u>	<u>Vegetation type</u>		
			<u>S</u>	<u>M</u>	<u>C</u>
FERNS					
AZOLLACEAE (Azolla family)					
<i>Azolla filiculoides</i> Lamk.	azolla	X	-	+	-
NEPHROLEPIDACEAE (Sword fern family)					
<i>Nephrolepis multiflora</i> (Roxb.) Jarrett ex Morton	hairy sword fern, 'okupukupu	X	-	+	-
THELYPTERIDACEAE (Wood-fern family)					
<i>Christella parasitica</i> (L.) Levl.	wood-fern	X	-	+	-
GYMNOSPERMS					
ARAUCARIACEAE (Araucaria family)					
<i>Araucaria columnaris</i> (G. Forst.) Hook.	Cook pine	X	+	-	-
FLOWERING PLANTS					
DICOTS					
ACANTHACEAE (Acanthus family)					
<i>Barleria cristata</i> L.	barleria	X	-	+	-
AMARANTHACEAE (Amaranth family)					
<i>Amaranthus spinosus</i> L.	spiny amaranth, pakai kuku	X	+	+	+
ANACARDIACEAE (Mango family)					
<i>Mangifera indica</i> L.	mango, manako	X	+	-	-
APOCYNACEAE (Dogbane family)					
<i>Cascabela thevetia</i> (L.) Lippold	be-still-tree	X	-	+	-
ARISTOLOCHIACEAE (Birthwort family)					
<i>Aristolochia littoralis</i> Parodi	Dutchman's pipe	X	+	+	-

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<u>Scientific name</u>	<u>Common name</u>	<u>Status</u>	<u>Vegetation type</u>		
			<u>S</u>	<u>M</u>	<u>C</u>
ASCLEPIADACEAE (Milkweed family)					
<i>Calotropis gigantea</i> (L.) W.T. Aiton	crown flower, puakalaunu	X	-	-	+
ASTERACEAE (Daisy family)					
<i>Ageratum conyzoides</i> L.	maile hohono	X	-	+	-
<i>Bidens pilosa</i> L.	Spanish needle, ki, ki nehe	X	-	+	-
<i>Conyza bonariensis</i> (L.) Cronq.	hairy horseweed, ilioha	X	+	+	-
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore		X	-	+	-
<i>Cyanthillium cinereum</i> (L.) H. Rob.	little ironweed	X	-	+	-
<i>Eclipta prostrata</i> (L.) L.	false daisy	X	-	+	-
<i>Emilia fosbergii</i> Nicolson	pualele	X	-	+	-
<i>Pluchea carolinensis</i> (Jacq.) G. Don	pluchea, sourbush	X	+	+	+
<i>Pluchea indica</i> (L.) Less.	Indian pluchea, Indian fleabane	X	-	+	-
<i>Sonchus oleraceus</i> L.	sowthistle, pualele	X	+	-	-
<i>Synedrella nodiflora</i> (L.) Gaertn.	nodeweed	X	+	+	-
<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.		X	+	+	-
<i>Wedelia trilobata</i> (L.) Hitchc.	golden crown-beard	X	+	-	+
<i>Xanthium strumarium</i> var. <i>canadense</i> (Mill.) Torr. & A. Gray	wedelia	X	-	+	-
	cocklebur, kikania	X	+	+	+
BIGNONIACEAE (Bignonia family)					
<i>Macfadyena unguis-cati</i> (L.) A. Gentry	cat's-claw climber	X	+	-	-
CACTACEAE (Cactus family)					
<i>Hylocereus undatus</i> (Haw.) Britton & Rose	night-blooming cereus	X	+	-	-
<i>Opuntia cochenillifera</i> (L.) Mill.	cochineal cactus	X	+	-	-
<i>Opuntia ficus-indica</i> (L.) Mill.	panini, papipi	X	+	-	-
CHENOPODIACEAE (Goosefoot family)					
<i>Atriplex semibaccata</i> R. Br.	Australian saltbush	X	+	-	-
<i>Chenopodium murale</i> L.	'aheahea	X	+	-	+
COMBRETACEAE (Indian almond family)					
<i>Terminalia catappa</i> L.	tropical almond, false kamani	X	-	-	+

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Scientific name	Common name	Status	Vegetation type		
			S	W	C
CONVOLVULACEAE (Morning glory family)					
<i>Ipomoea alba</i> L.	moonflower, koali pehu	X	-	+	-
<i>Ipomoea indica</i> (J. Burm.) Merr.	koali 'awa, koali 'awahia	I	-	+	-
<i>Ipomoea obscura</i> (L.) Ker-Gawl.	field bindweed	X	+	+	-
<i>Ipomoea pes-caprae</i> ssp. <i>brasiliensis</i> (L.) Ooststr.	pohuehue, beach morning glory	I	-	-	+
<i>Merremia aegyptia</i> (L.) Urb.	hairy merremia, koali kua hulu	X?	+	-	-
<i>Merremia tuberosa</i> (L.) Rendle	wood rose, pilikai	X	-	+	-
CRASSULACEAE (Orpina family)					
<i>Kalanchoe pinnata</i> (Lam.) Pers.	air plant, life plant, 'oliwa ku kahakai	X	+	-	-
<i>Kalanchoe tubiflora</i> (Harv.) Raym.-Hamet	chandelier plant	X	+	-	-
CUCURBITACEAE (Gourd family)					
<i>Cucumis dipsaceus</i> Ehrenb. ex Spach	wild cucumber, hedgehog gourd, teasel gourd	X	+	-	-
<i>Momordica charantia</i> L.	wild bittermelon, balsam pear	X	+	+	-
<i>Sicyos</i> sp. <i>pachycarpus</i> Hook. & Arnott	kupala	E	+	-	-
EUPHORBIACEAE (Spurge family)					
<i>Ricinus communis</i> L.	castor bean, kofi	X	+	+	+
FABACEAE (Pea family)					
<i>Acacia farnesiana</i> (L.) Willd.	klu	X	+	-	-
<i>Cassia</i> sp. <i>fistula</i> L.	golden shower	X	+	-	-
<i>Cassia</i> sp.	shower tree	X	+	-	-
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea, lauki	X	+	-	-
<i>Crotalaria pallida</i> Aiton	smooth rattlepod, pikakani	X	+	+	-
<i>Desmanthus pernambucanus</i> (L.) Thellung	virgate mimosa, slender mimosa	X	+	+	-
<i>Desmodium sandwicense</i> E. Mey.	Spanish clover, chili clover, pua pilipili	X	-	+	-
<i>Erythrina</i> sp.		X?	+	-	-
<i>Indigofera suffruticosa</i> Mill.	indigo, 'iniko	X	+	+	-
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole, ekoa	X	+	+	+
<i>Macroptilium latyroides</i> (L.) Urb.	wild bean, cow pea	X	+	-	-
<i>Mimosa pudica</i> var. <i>unijuga</i> (Duchass. & Walp.) Griseb.	sensitive plant, pua hilahila	X	-	+	-

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Scientific name	Common name	Status	Vegetation type		
			S	W	C
<i>Peltophorum inerme</i> (Roxb.) Naves	yellow poinciana	X	+	-	-
<i>Phaseolus</i> sp.		X	+	-	-
<i>Pithecellobium dulce</i> (Roxb.) Benth.	'optuma	X	+	+	+
<i>Prosopis juliflora</i> (Sw.) DC	algaroba, mesquite	X	-	-	+
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X	+	+	+
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	X	+	+	-
<i>Senna alata</i> (L.) Roxb.	candle bush	X	-	+	-
<i>Senna occidentalis</i> (L.) Link	coffee senna, 'aukoi	X	+	+	-
<i>Tamarindus indica</i> L.	tamarind	X	+	-	-
GOODENIACEAE (Goodenia family)					
<i>Scaevola sericea</i> Vahl	naupaka kahakai, naupaka, beach naupaka	I	-	-	+
LAMIACEAE (Mint family)					
<i>Leonotis nepetifolia</i> (L.) R. Br.	lion's ear	X	+	+	+
<i>Ocimum gratissimum</i> L.	wild basil	X	+	-	+
<i>Salvia occidentalis</i> Sw.	West Indian sage	X	+	-	-
LYTHRACEAE (Loose strife family)					
<i>Cuphea carthagenensis</i> (Jacq.) Macbr.	tarweed, Colombian cuphea	X	-	+	-
MALVACEAE (Mallow family)					
<i>Abutilon grandifolium</i> (Willd.) Sweet	hairy abutilon, ma'o	X	+	+	-
<i>Abutilon incanum</i> (Link) Sweet	ma'o, hoary abutilon	I?	+	-	-
<i>Hibiscus tiliaceus</i> L.	hau	I?	+	-	-
<i>Malva parviflora</i> L.	cheese weed	X	+	-	-
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	X	+	+	-
<i>Sida acuta</i> ssp. <i>carpinifolia</i> (L.f.) Borssum Waalkes	acute-leaved sida	X	-	+	-
<i>Sida fallax</i> Walp.	'ilima	I	+	-	+
<i>Sida spinosa</i> L.	prickly sida	X	+	-	-
<i>Thespesia populnea</i> (L.) Sol. ex Correa	milo	I?	-	+	+
MELIACEAE (Mahogany family)					
<i>Melia azedarach</i> L.	Chinaberry, pride-of-India, 'inia	X	+	-	-

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Scientific name	Common name	Status	Vegetation type		
			S	W	C
<i>Swietenia mahoganii</i> (L.) Jacq.	West Indian mahogany	X	+	-	-
MORACEAE (Mulberry family) <i>Ficus microcarpa</i> L.f.	Chinese banyan, Malayan banyan	X	+	+	-
MYRTACEAE (Myrtle family) <i>Eugenia uniflora</i> L. <i>Syzygium cumini</i> (L.) Skeels	Surinam cherry Java plum	X X	+	-	-
NYCTAGINACEAE (Four-o'clock family) <i>Bougainvillea glabra</i> Choisy <i>Bougainvillea spectabilis</i> Willd. <i>Mirabilis jalapa</i> L.	bougainvillea, pukanawila purple bougainvillea four-o'clock, nani ahiahi	X X X	+	-	-
ONAGRACEAE (Evening primrose family) <i>Ludwigia octovalvis</i> (Jacq.) Raven	primrose willow, kamole	P?	-	+	-
PASSIFLORACEAE (Passion flower family) <i>Passiflora edulis</i> forma <i>flavicarpa</i> Degener	passion fruit, liliko'i	X	-	+	-
PHYTOLACCACEAE (Pokeweed family) <i>Rivina humilis</i> L.	rouge plant, coral berry	X	+	-	-
PLUMBAGINACEAE (Leadwort family) <i>Plumbago zeylanica</i> L.	'ilia'e, hilia'e	I	+	-	-
POLYGONACEAE (Buckwheat family) <i>Antigonon leptopus</i> Hook. & Arnott <i>Polygonum</i> sp.	Mexican creeper, chain-of-hearts knotweed	X X	+	-	-
PORTULACACEAE (Purslane family) <i>Portulaca oleracea</i> L.	pigweed, common purslane, 'ihi	X	+	-	-
SAPINDACEAE (Soapberry family) <i>Dodonaea viscosa</i> Jacq.	'a'ali'i, 'a'ali'i ku makani	I	-	-	+

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Scientific name	Common name	Status	Vegetation type		
			S	W	C
SOLANACEAE (Nightshade family) <i>Capsicum frutescens</i> L. <i>Physalis angulata</i> L. <i>Solanum americanum</i> Mill. <i>Solanum lycopersicon</i> var. <i>cerasiforme</i> (Dunal) Spooner, Anderson & Jansen <i>Solanum seaforthianum</i> Andr.	chili pepper, nioi popolo, glossy nightshade currant tomato blue potato vine	X X I? X X	+	-	-
STERCULIACEAE (Cacao family) <i>Waltheria indica</i> L.	'uhaloa, hi'aloa, kanakaloa	I?	+	-	+
VERBENACEAE (Verbena family) <i>Lantana camara</i> L. <i>Verbena litoralis</i> Kunth	lantana, lakana weed verbena, owi, oi	X X	+	-	+
MONOCOTS					
AGAVACEAE (Sisal family) <i>Agave sisalana</i> Perrine <i>Furcraea foetida</i> (L.) Haw.	sisal, malina Mauritius hemp	X X	+	-	-
ARACEAE (Aroid family) <i>Pistia stratiotes</i> L.	water lettuce	X	-	+	-
ARECACEAE (Palm family) <i>Cocos nucifera</i> L. <i>Livistona chinensis</i> (Jacq.) Mart. <i>Phoenix sylvestris</i> (L.) Roxb. <i>Roystonea</i> sp.	coconut, niu Chinese fan palm wild date palm royal palm	P X X X	+	+	+
COMMELINACEAE (Spiderwort family) <i>Commelina diffusa</i> N.L. Burm.	honohono	X	-	+	-
CYPERACEAE (Sedge family) <i>Cyperus alternifolius</i> ssp. <i>flabelliformis</i> (Rottb.) Kuentz.	umbrella plant, 'ahu 'awa haole, pu'uka'a	X	-	+	-

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Scientific name	Common name	Status	Vegetation type		
			s	w	c
Cyperus sp.		X	-	+	-
Kyllinga brevifolia Rottb.	green kyllinga, killi'o'opu	X	-	+	-
Schoenoplectus californicus (C.A. Mey.) Palla	bulrush, kaluha	X?	-	+	-
LEMNACEAE (Duckweed family)					
Lemna equinoctialis Walw.	duckweed	X	-	+	-
Spirodela polyrhiza (L.) Schleid.	greater duckweed	X	-	+	-
LILIACEAE (Lily family)					
Crinum sp.		X	+	-	-
MUSACEAE (Banana family)					
Musa X paradisiaca L.	banana, mai'a	X	+	-	-
POACEAE (Grass family)					
Bambusa spp.	bamboo	X	+	-	-
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	X	+	-	-
Brachiaria mutica (Forssk.) Stapf	California grass	X	+	+	-
Cenchrus ciliaris L.	buffelgrass	X	+	+	-
Cenchrus echinatus L.	common sandbur, 'ume 'aiu	X	+	+	+
Chloris barbata (L.) Sw.	swollen fingergrass, mau'u lei	X	-	-	+
Coix lachryma-jobi L.	Job's tears	X	+	+	+
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X	+	+	+
Dichanthium sp.		X	+	+	+
Digitaria ciliaris (Retz.) Koeler	Henry's crabgrass	X	+	-	-
Digitaria insularis (L.) Mez ex Ekman	sourgrass	X	+	-	-
Digitaria sp.	crabgrass	X	+	+	+
Echinochloa colona (L.) Link	jungle rice	X	+	-	-
Echinochloa crus-galli (L.) P. Beauv.	barnyard rice	X	-	+	-
Eleusine indica (L.) Gaertn.	wiregrass, goosegrass	X	-	+	-
Eragrostis amabilis (L.) Wight & Arnott	lovegrass	X	-	+	-
Leptochloa uninervis (K. Presl.) Hitchc. & Chase	leptochloa	X	-	+	-
Malinis repens (Willd.) Zizka	Natal redtop, Natal grass	X	+	-	-
Panicum maximum Jacq.	Guinea grass	X	+	+	+

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Scientific name	Common name	Status	Vegetation type		
			s	w	c
Panicum maximum var. trichoglume Eyles ex Robyns	green panicgrass	X	+	-	-
Paspalum conjugatum Bergius	Hilo grass, mau'u Hilo	X	-	+	-
Pennisetum purpureum Schumach.	Napier grass, elephant grass	X	-	+	-
Sacciolepis indica (L.) Chase	Glenwood grass	X	-	+	-
Setaria verticillata (L.) P. Beauv.	bristly foxtail, mau'u pilipili	X	+	-	-
Sporobolus virginicus (L.) Kunth	'aki'aki, beach dropseed	I	-	-	+
Stenotaphrum secundatum (Walt.) Ktze.	St. Augustine grass, buffalo grass, 'aki'aki haoie	X	-	+	+
PONTEDERIACEAE (Pickereel weed family)					
Eichhornia crassipes (Mart.) Solms	water hyacinth	X	-	+	-

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B

FERAL MAMMAL
AND AVIFAUNAL SURVEY
PHILIP BRUNER

SURVEY OF THE AVIFAUNA AND FERAL MAMMALS FOR THE PROPOSED

KAPALAWAI RESORT, KAPALAWAI, KAUAI, HAWAII

INTRODUCTION

The purpose of this report is to summarize the findings of a bird and mammal field survey, conducted between 5-7 March 1999, of a 170 acre site at Kapalawai, Kauai (Fig. 2). Also included are references to pertinent literature and unpublished reports.

Prepared for

The objectives of the field survey were to:

Heiber Hastert and Fee

- 1- Document what bird and mammal species occur on the property. Note other birds and mammals that potentially could be found in this area.
- 2- Provide some baseline data on the relative abundance of each species.
- 3- Note the presence or likely occurrence of any native fauna, particularly those that are listed as "Endangered" or "Threatened".
- 4- Determine if the property contains any special or unique resources important to native wildlife.

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SITE DESCRIPTION

This 170 acre beach front site contains a variety of habitats. Introduced vegetation dominates the property. Recent clearing of brush has opened up the understorey. Cattle grazing has also impacted the vegetation. During one day of the survey Kiawe on the NE of the property was being cut for firewood.

15 March 1999

Weiland habitat exists at several locations. Stream drainages and vegetation choked marshes are surrounded by dry parkland habitat. A sandy beach fronts the entire

property. Residential habitat with lawns and large fruit trees are to be found around the old plantation house.

The weather during the survey period was clear and calm. The dry dusty conditions suggested there had not been significant rain in this area for sometime.

STUDY METHODS

The property was surveyed from 5-7 March 1999. The site was walked and all habitats were visited several times both early and late in the day. Field observations were made with the aid of binoculars and by listening for vocalizations.

At scattered locations throughout the site, eight minute counts were made of all birds seen or heard (Fig. 1). These data provide the basis for the relative abundance estimates given in Table One. Published and unpublished reports of birds known from similar habitat on Kauai were also consulted in order to acquire a better perspective of the possible fauna that could occur in this region and their potential relative abundance (Prait et al. 1987, Hawaii Audubon Society 1993, Bruner 1990, 1991, 1992, 1993, 1996).

Observations of feral mammals were limited to visual sightings and evidence in the form of scats and tracks. No attempts were made to trap mammals in order to obtain data on their relative abundance and distribution. Such an effort was not possible nor necessary within the time constraints of the field survey. Two evenings were devoted to looking for bats and owls.

Scientific names of birds and mammals used in this report follow those given in Checklist of the Birds of Hawaii (Pyle 1997) and Mammal Species of the World (Honacki et al. 1982).

RESULTS AND DISCUSSION

Resident Endemic (Native) Birds:

No native landbirds were recorded on the survey. Given the location, elevation and type of habitats available at this site the absence of native landbirds was not unexpected. The Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) forages in agricultural fields and pastures as well as in upland forested habitat (Hawaii Audubon Society 1993). This species is fairly common on Kauai. On Oahu it is listed as endangered by the State of Hawaii. Although this species was not recorded on this survey it could forage in this area. Pueo nest on the ground and prefer tall grass. The grazed and recently cleared understorey at this site would not be preferred nesting habitat for Pueo.

Migratory Indigenous (Native) Birds:

Migratory shorebirds winter in Hawaii between the months of August through May. Some juveniles will stay over the summer months as well (Johnson et al. 1981, 1983, 1989). The most abundant shorebird species which winter in Hawaii is the Pacific Golden-Plover (*Plevialis fulva*). Plover forage in open areas such as mud flats, lawns,

pastures, plowed agricultural fields and roadsides. Plover are extremely site-faithful and most establish winter foraging territories which they defend vigorously. Such behavior makes it possible to accurately census the plover population in a particular area (Johnson et al. 1989). A total of nine plover were recorded on the survey. These birds were seen in open cleared land, lawns and along the beach. The Ruddy Turnstone (Arenaria interpres) is the second most common migratory shorebird in Hawaii. They also forage in pastures and open ranch lands. A total of five turnstone were tallied on the survey. Three Wandering Tattler (Heteroscelus incanus) were seen on the beach. This species forages along beaches, rocky shorelines, streams, mudflats and wetlands. Neither the plover, tattler nor the turnstone are listed as endangered or threatened.

Resident Indigenous (Native) Seabirds:

No seabirds were recorded nor would any be expected at this location. Predators such as dogs and cats along with human disturbance limit seabird nesting to a few isolated locations on the main Hawaiian Islands (Hawaii Audubon Society 1993).

Resident (Native) Waterbirds:

Six Common Moorhen (Gallinula chloropus) were observed in the wetlands. They were seen in the open stream drainages and along the edges of the marsh habitats. This shy species is more often heard than seen. They quickly retreat into the vegetation when approached. This species is endangered in Hawaii. A pair of Hawaiian Duck (Koloa) (Anas wyvilliana) were flushed from a stream on 7 March. Koloa are endangered but are still relatively common on Kauai. The abundance of wetland habitats

on this island, plus the absence of the predacious Small Indian Mongoose (Herpestes auropunctatus) may be important reasons for its continued success on Kauai. A total of four Black-crowned Night Herons (Nycticorax nycticorax) were observed on the survey. This species is the only native waterbird that is not endangered. They are opportunistic foragers and take a wide variety of prey. These four herons were seen in the wetlands and flying over the property.

The three endangered wetland species that were not recorded include: Hawaiian Goose (Nene) (Branta sandvicensis), Hawaiian Coot (Fulica alai) and Black-necked Stilt (Himantopus mexicanus). All of these species might potentially occur in this area. However, the present vegetation choked marshes are not particularly attractive to these species. Coot prefer more open water habitat. Stilt need shallow areas for wading.

Exotic (Introduced) Birds:

A total of 17 species of exotic birds were recorded during the course of the field survey. This list compares favorably with that obtained on similar lands by Bruner (1990, 1991, 1992, 1993, 1996). Table One shows the relative abundance of each species. In addition to these species other exotic birds which potentially could occur on the property include: Barn Owl (Tyto alba), Skylark (Alauda arvensis), and Greater Laughing-thrush (Garrulus pectoralis) (Pratt et al. 1987, Hawaii Audubon Society 1993).

Exotic Mammals:

Several cats (*Felis catus*) were seen. Dog (*Canis familiaris*) tracks were also abundant. Pig (*Sus scrofa*) tracks were seen at several locations around the property. The endemic and endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) is frequently seen on Kauai (Tomich 1986, Kepler and Scott 1990). Three bats were observed foraging for flying insects just offshore on the evening of 5 March. On 6 March one bat was observed flying back and forth over the marsh. This species is known to roost solitarily in trees and forages for flying insects using echolocation (Jacobs 1993). They use a variety of habitats including native forest, ranchlands, ponds and bays as well as urban areas (Jacobs 1991). The life history of this species is not well known. The most recent bat research on the Big Island has yielded some new insights into their behavior (Reynolds et al. 1998). I was not surprised to find bats on this property. I have recorded bats on many sites I have visited on Kauai. Rats and mice undoubtedly occur on the property but were not seen.

CONCLUSION

A short field survey can only provide a limited view of the wildlife that may use the site. The number of species and their relative abundance may vary throughout the year due to resource (food, water) availability and reproductive success. Species which are migratory will only be an important part of the faunal picture at certain times during the year. Exotic species sometimes prosper for a time only to later disappear or become a

less significant part of the faunal community (Williams 1987, Moulton 1990). Thus while only long term studies can provide a comprehensive view of the bird and mammal populations in a particular area, some general conclusions related to bird and mammal activity at this site can be made. Below is a summary of the findings of this survey.

- 1 The site was surveyed by walking the entire property. Census data on birds were obtained at random locations in all habitat types throughout the property and are reported in the text and in Table One.
- 2 No native resident landbirds were tallied on the survey. The native owl (Puco) occurs on Kauai but was not recorded on this survey. They are listed by the State of Hawaii as endangered on the island of Oahu but not Kauai.
- 3 The migratory Pacific Golden-Plover, Ruddy Turnstone and Wandering Tattler were present on this site. These species are common migrants and are not endangered or threatened.
- 4 The list of exotic birds recorded on the survey (Table 1) was typical for this area and compared favorably with the data obtained by Bruner on other similar properties on Kauai.
- 5 Cats, dogs and pigs were recorded at this site. Rats and mice probably occur in this area but were not found on this survey. The endangered Hawaiian Hoary Bat was observed. This species is fairly common on Kauai. I have seen them at many sites around the island. The proposed development should not adversely impact foraging opportunities for bats. They forage in urban as well as forested habitats.

6 This property has been significantly altered by introduced vegetation and ranching. No unusual or unexpected species were recorded. The wetland habitats serve as foraging sites for native waterbirds. Presently the marshy areas are overgrown with emergent vegetation. This restricts their access to waterbirds. If these marshes were opened up by removal of some vegetation they would provide better habitat for waterbirds. A complete removal of vegetation leaving an open pond with a rock or dirt wall would not be attractive to native waterbirds. They require cover in the form of emergent vegetation to avoid predators or as a place to retreat when disturbed. One approach might be to clear the vegetation along the shoreline and in the water and retain vegetation on the pond's island. The advantage of this would be that the island would provide cover and nesting opportunities that would be protected from cats. Visually this would make the wetland more attractive while still providing safe habitat for native waterbirds.

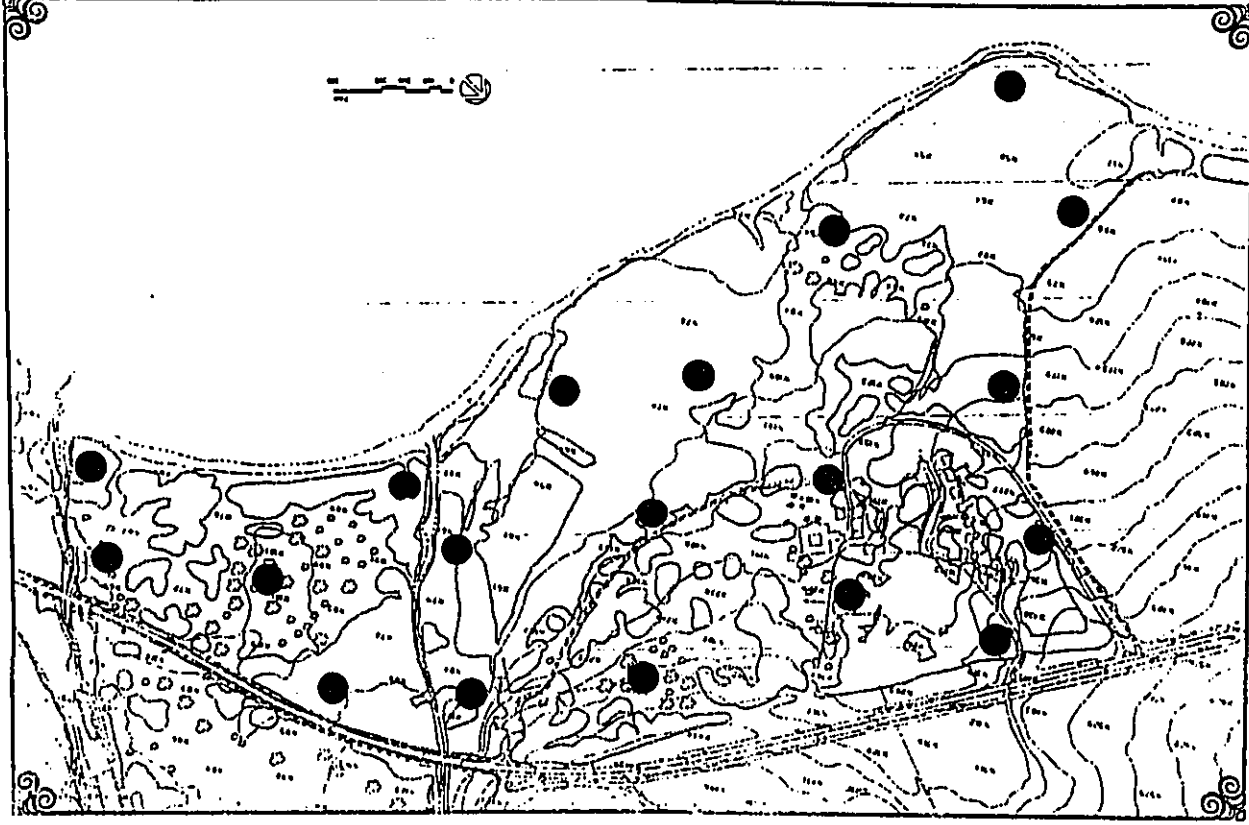


Fig. 1. Location of faunal survey. Solid circles indicate the sites of eight minute counts.

KEY TO TABLE 1

TABLE 1
Introduced species of birds recorded on the site of the proposed Kapalawai Resort, Kapalawai, Kauai

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE
Cattle Egret	<i>Butorides ibis</i>	U
Erected Francolin	<i>Francolinus erectus</i>	R=4
Red Junglefowl	<i>Gallus gallus</i>	C
Ring-necked Pheasant	<i>Phasianus colchicus</i>	R=6
Spotted Dove	<i>Streptopelia chinensis</i>	C
Zebra Dove	<i>Geopelia striata</i>	C
White-rumped Shama	<i>Copsychus malabaricus</i>	U
Hwamei	<i>Samulus canopus</i>	R=2
Northern Mockingbird	<i>Mimus polyglottus</i>	U
Common Myna	<i>Acridotheres tristis</i>	U
Japanese White-eye	<i>Zosterops japonicus</i>	A
Northern Cardinal	<i>Cardinalis cardinalis</i>	C
Red-crested Cardinal	<i>Panoplia corynata</i>	C
House Finch	<i>Carpodacus mexicanus</i>	C
House Sparrow	<i>Passer domesticus</i>	R=5
Nutmeg Mannikin	<i>Lonchura punctulata</i>	U
Chestnut Mannikin	<i>Lonchura malacca</i>	U

Relative abundance = Number of times observed during the survey or frequency on eight minute counts in appropriate habitat.

A = abundant (ave. 10+)

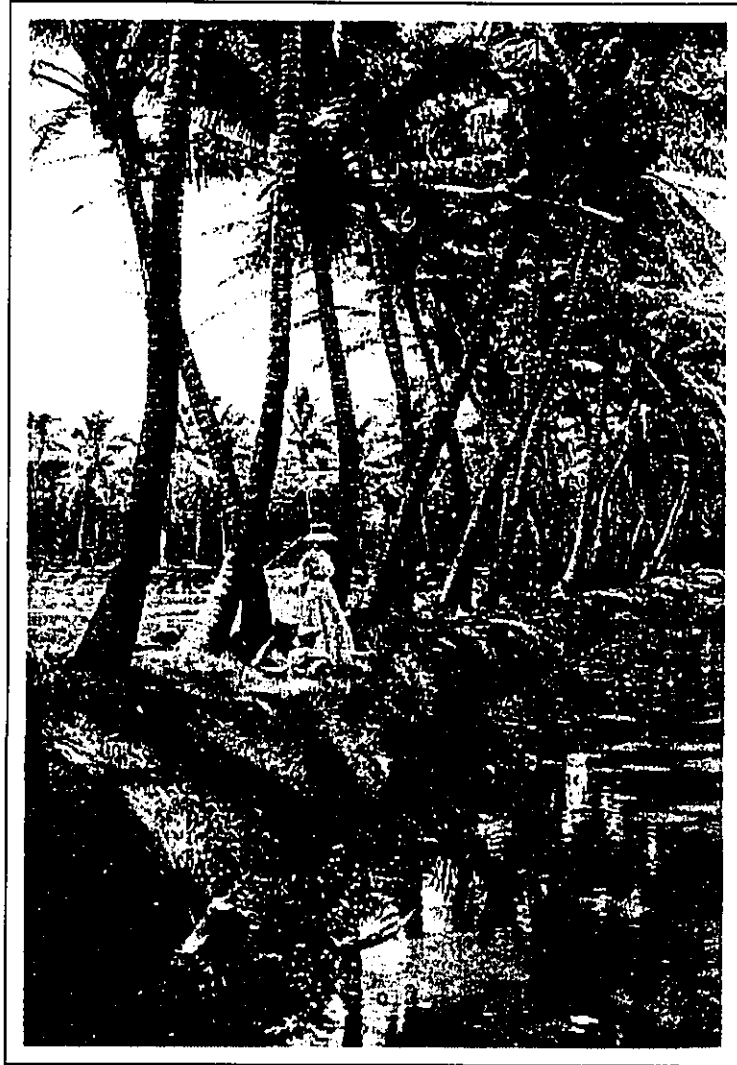
C = common (ave. 5-10)

U = uncommon (less than 5)

R = recorded (seen or heard on one count only or at times other than on eight minute counts. Number which follows is the total number of individuals seen or heard).

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MARINE ENVIRONMENTAL
ASSESSMENT
MARINE RESEARCH CONSULTANTS

**MARINE ENVIRONMENTAL ASSESSMENT,
KAPALAWAI RESORT
KAPALAWAI, KAUAI, HAWAII**

INTRODUCTION AND PURPOSE

Planning is underway for development of the Kapalawai Resort on a 170-acre site on the southwest shore of the island of Kauai (Figure 1). The site is bounded by Kaunaulii Highway to the northeast, agricultural fields to the northwest, Makaweli Landing to the southeast, and the Pacific Ocean to the southwest. The shoreline area on the northern part of the property is known as Poo Point, and the southern region of the shoreline forms the northern part of Hoanuanuu Bay. Mahaikona Stream bisects the property, and the Makaweli River enters the ocean approximately one kilometer north of the project site.

Planned facilities include an estimated 250 units for visitor accommodations, constructed as stand-alone cottages or duplexes. In addition two dining facilities and on-site recreational areas for swimming and tennis are planned. The present Robinson Family residence and related structures will be maintained as a museum to preserve the history of the western region of Kauai. None of the proposed plans call for any alteration of the shoreline or nearshore region.

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PHYSICAL STRUCTURE OF THE NEARSHORE ENVIRONMENT

A narrow sand beach stretches along the length of the project boundary. In the approximate center of the property, a pond with standing water extends from the back beach landward. At present the pond is densely populated with aquatic plants; however aerial photographs taken in past decades indicate that the pond once contained an expanse of open water.

Along the southern end of the property, from approximately the location of the stream to Makaweli landing, the nearshore marine environment consists of a shallow, gently sloping plain of fine-grained red mud. Near the shoreline, the mud grades into a mix of mud and sand. The mud zone extends uninterrupted from near the shoreline to a distance of approximately 1 km offshore. Within this area there is virtually no exposed solid bottom, as such there is no reef development. It is apparent that Hoanuanu Bay receives (or has received) substantial quantities of terrigenous sediment during periods of runoff. It also appears that the topography (shape) of the bay is such that sediments are retained within the coastal indentation, and are not rapidly flushed from the area. As a result, there is a substantial permanent depositional zone of mud within the bight of Hoanuanu Bay at the southern end of the Kapalawai property.

From the point where the stream would cross the shoreline northward, the nearshore area is made up of two zones; an inner reef flat and an outer reef front that are separated by a shallow reef crest. Long-period swells become breaking waves on reaching the reef crest. As a result of the high energy, few corals occur on the crest. Bottom composition of the reef flat consists of muddy sand and coral rubble; maximum water depth on the reef flat is approximately 2 meters (m). Because of the shallow depth, high terrigenous sediment content and vigorous water motion from wave energy, water clarity on the reef flat is highly turbid. However, living colonies of corals were observed on the reef flat, predominantly lobate hemispherical heads of *Porites lobata*, and sturdy, branching colonies of *Pocillopora meandrina*.

Seaward of the reef crest, the bottom slopes gradually downward with distance offshore. The underwater physiographic structure in the nearshore zone consists of a platform of fluted reefal limestone. While areas of the platform are relatively flat, other regions are characterized by substantial vertical relief in the form of deep grooves and undercut ledges in what appears to be ancient coral reef platform (Figure 3). Vertical relief of the reef structures is generally not more than one meter. Grooves and channels in the reef platform are generally filled with coarse sand and rubble. The surfaces of the reef platforms are heavily pitted, probably as a result of bioerosion, resulting in an extremely friable (breakable) upper surface. A ubiquitous feature of the reef platform

is a veneer of red mud sediment that appears to be bound to the limestone surface within a short layer of algal turf. The thickness of the muddy layer decreases with distance northward and offshore. The predominant biota on the inner reef platform are flat encrustations of several species of stony corals, and calcareous algae.

The entire area offshore of the proposed project is exposed to long-period swells generated by storms in the north Pacific during the winter months, and the south Pacific in the summer months. As a result of the physical forces associated with winter waves, the nearshore areas off Kapalawai are subjected to extreme stress from wave impact and scouring of sediment from wave action. As in many locations in the Hawaiian Islands, the composition of coral reef communities is structured primarily in response to physical forces of breaking waves (Dollar 1982, Dollar and Trumble 1993). In addition, the high loading and accumulation of terrigenous sediment in the areas offshore of Kapalawai appear to be a major factor in affecting biotic composition of the reef communities.

WATER CHEMISTRY

Methods

Two locations fronting the Kapalawai site were selected as sampling sites for evaluation of existing water chemistry. Site 1 lies at the northern end of the property off the southern side of Poo Point; Site 2 lies off the southern end of the property, originating near the point where the stream enters the ocean (Figure 1). Water chemistry was evaluated along sampling transects at each site. Each transect was oriented perpendicular to the shoreline, and extended from the highest wash of waves across the nearshore reef platform out to the open ocean, a distance of approximately 500 meters (m).

Water samples were collected at nine stations along each transect. Such sampling was intended to span the entire range of material input at the shoreline to the open coastal ocean. Sampling was more concentrated in the nearshore zone as this area is most likely to show the effects of shoreline modification. At each station a surface sample was collected within approximately 10 centimeters (cm) of the surface. With the exception of the stations located on the reef flat within 50 m from the shoreline, a bottom sample was collected within 1 m of the sea floor.

Surface water samples were collected by opening triple-rinsed, one-liter polyethylene bottles near the air-sea interface. Bottom samples were collected using a 1.8-liter Niskin-type oceanographic sampling bottle. These bottles were lowered to the desired depth in an open position, where

spring-loaded endcaps were triggered to close by a messenger released from the surface. Subsamples for nutrient analyses from both surface and deep samples were immediately placed in 125-milliliter (ml) acid-washed, triple rinsed, polyethylene bottles and stored on ice until returned to Honolulu.

Water quality constituents that were measured included the specific criteria designated for open coastal waters in Chapter 11-54, Section 06 (Open Coastal Waters) of the State of Hawaii, Department of Health (DOH) Water Quality Standards. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen ($\text{NO}_3^- + \text{NO}_2^-$, hereafter referred to as NO_3^-), ammonium (NH_4^+), total phosphorus, chlorophyll *a* (Chl *a*), turbidity, temperature, pH and salinity. In addition, orthophosphate phosphorus (PO_4^{3-}) and silica (Si) are also reported because these parameters are sensitive indicators of biological activity and the degree of freshwater input to the ocean, respectively.

Analyses for NH_4^+ , PO_4^{3-} , and $\text{NO}_3^- + \text{NO}_2^-$ were performed with a Technicon autoanalyzer using standard methods for seawater analysis (Strickland and Parsons 1988, Grasshoff 1983). TN and TP were analyzed in a similar fashion following oxidative digestion. Dissolved organic nitrogen (DON) and dissolved organic phosphorus (DOP) were calculated as the difference between total dissolved nitrogen (TDN) and dissolved inorganic N (DIN), and total dissolved phosphorus (TDP) and dissolved inorganic P (DIP), respectively. The level of detection for the dissolved nutrients is 0.2 μM for TN and Si, 0.02 μM for TP, NO_3^- and NH_4^+ , and 0.01 μM for PO_4^{3-} .

Water for other analyses was subsampled from 1-liter polyethylene bottles and kept chilled until analysis. Turbidity was measured on a Mottlak Model 21 nephelometer, and reported in nephelometric turbidity units (NTU). Chl *a* was measured by filtering 300 ml of water through sub-micron glass-fiber filters (GFF), pigments on filters were extracted in 90% acetone in the dark at -5°C for 12-24 hours, and the fluorescence before and after acidification of the extract was measured with a Turner Designs fluorometer. Salinity was determined using an AGE Model 2100 laboratory salinometer with a precision of 0.0003‰. TSS was determined gravimetrically.

In-situ field measurements included pH using a field meter with readability of 0.01 pH unit.

All analyses were conducted by Marine Analytical Specialists (Honolulu, HI). This laboratory possess the required approval ratings for the analyses.

Results

Environmental Conditions

Water samples were collected on March 13, 1999. Environmental conditions were sunny with light winds from the south. It is important to note that much of the rest of Kauai was experiencing heavy rainfall during the survey, while the weather was sunny at Kapalawai. Such a situation appears to be the norm, as the leeward side of the island is typically nearly arid in climate. Ocean conditions consisted of calm seas with small surf breaking on the reef crest. Water sampling was conducted during slack tide at approximately +0.2 feet above mean low water.

Horizontal and Vertical Stratification

Tables 1 and 2 show the results of all water chemistry analyses for samples collected off of the Kapalawai site on March 13, 1999. Concentrations of dissolved nutrients are shown in micromolar (μM) units in Table 1, and in units of micrograms per liter ($\mu\text{g/L}$) in Table 2. The concentrations of dissolved nutrients, TSS, turbidity, salinity, and Chl *a* in surface and deep samples are plotted as functions of distance from the shoreline in Figures 2-5.

Examination of Figures 2-5 reveal several distinct patterns with respect to horizontal stratification of water chemistry. The plot of salinity vs distance reveal a sharp gradient of increasing salinity on the reef flat between the shoreline and 50 m offshore (Figure 2). As there was no streamflow reaching the ocean during the sampling, the freshwater input to the area appears to be from efflux of groundwater in the nearshore zone that mixes with oceanic water (~35‰). Freshwater efflux appears to be greater on the northern transect relative to the southern transect. Seaward of the reef flat, there was little evidence of variation in salinity between the samples collected 100 to 500 m from shore.

The plots of dissolved nutrients Si, NO_3^- , TN, PO_4^{3-} and TP exhibit patterns that are mirror images of the patterns of salinity (Figures 2 and 3). Groundwater normally contains high concentrations of these nutrients and low salinity, while seawater typically contains low nutrient content and high salinity. While salinity is also generally low in surface runoff (i.e., rainfall), nutrients are also low, hence there is relatively little corresponding increase in nutrients with decreased salinity. Hence, the mirror images of salinity and concentrations of nutrients off Kapalawai indicate input of groundwater at the shoreline.

As freshwater is lower in density than seawater, there is also an indication of vertical stratification of nutrients and salinity. Salinity is consistently higher in bottom samples than surface samples, which nutrient concentrations are elevated in surface samples relative to bottom samples. However, at the sampling stations that exhibited the greatest variation in nutrient concentrations and salinity on the reef flat, the shallow depth of water precluded sampling at the surface and bottom.

The patterns of distribution of dissolved organic nutrients (DON, DOP) and NH_4^+ that are not present in relatively high concentrations in groundwater are distinctly different from the patterns for inorganic nutrients (Figure 4). The concentrations of NH_4^+ on the south transect are essentially constant in value across the entire transect. On the north transect the concentrations of NH_4^+ peak at the outer boundary of the reef flat.

Profiles of DON and DOP show little pattern throughout the sampling regime.

On both transects, TSS and turbidity peaked at the shoreline and decreased with distance from shore (Figure 5). TSS and turbidity were also higher on the northern transect compared to the southern transect from the shoreline to a distance of 300 m from shore. Chl *a* was also highest on the reef flat, peaking in concentration at the shoreline on the north transect and 25 m from shore on the southern transect.

Compliance with DOH Standards

DOH standards include specific criteria that are not to be exceeded during either 10% or 2% of the time, or as the geometric mean of the sampling set. With only one sample set collected to date from each sampling station, comparison of the 10% or 2% criteria or the geometric mean criteria for any sampling station are not statistically meaningful. However, comparing sample concentrations to these criteria provide an indication of whether water quality is near the stated specific criteria.

Table 2 shows samples seaward of the shoreline that exceed DOH water quality standards for open coastal waters under "wet" conditions. The criteria for wet conditions are applied to the Kapalawai area because this region probably receives at least 3 million gallons of groundwater input per mile per day. During the March 1999 survey, several constituents exceeded the 10% or 2% limits. On the north transects NO_3^- , turbidity and Chl *a* in samples within 50 m of the shoreline exceeded specific criteria. On the south transect, these constituents, as well as NH_4^+ , exceeded specific criteria. The recorded concentrations of NH_4^+ and Chl *a* exceeded specific criteria from the shoreline to a distance of 300 m from shore on the southern transect.

As noted in the section above, NO_3^- is a natural component of groundwater. In areas that receive substantial input of groundwater there is typically a zone of mixing near the shoreline where NO_3^- concentrations may consistently exceed DOH criteria as long as physical mixing processes remain low. However, NH_4^+ is not a normal component of groundwater. It is apparent that some other source of NH_4^+ than groundwater input is responsible for the elevated concentrations along almost the entirety of the south transect off of Kapalawai.

BIOTIC COMMUNITY STRUCTURE

Methods

All fieldwork was carried out on March 13-14, 1999, and was conducted from both a 26-foot boat using SCUBA gear, and from the shoreline. Biotic structure of benthic (bottom dwelling) communities inhabiting the reef environment was evaluated by establishing a descriptive and quantitative baseline between the shoreline and the 10 meter (m) (~30 foot) depth contour. Initial qualitative reconnaissance surveys were conducted that covered the area off the proposed Kapalawai property from the shoreline out to the 10 m contour. These reconnaissance surveys were useful in making relative comparisons between areas, identifying any unique or unusual biotic resources, and providing a general picture of the physiographic structure and benthic assemblages occurring throughout the region of study.

Following the preliminary survey, four quantitative transect sites were selected offshore of the proposed development area near the same sites where water quality was evaluated (two sites near each of the north and south transects) (see Figure 1). Each transect was oriented parallel to depth contours so as to bisect a single reef zone. Care was taken to place transects in random localities that were not biased toward either peak or low coral cover.

Quantitative benthic surveys were conducted by stretching a 50-m long surveying tape in a straight line over the reef surface. A quadrat frame with dimensions of 1 m x 0.7 m was sequentially placed over 10 random marks on the transect tape so that the tape bisected the long axis of the frame. At each quadrat location a color photograph recorded the segment of reef area enclosed by the quadrat frame. In addition, a diver knowledgeable in the taxonomy of resident species visually estimated the percent cover and occurrence of organisms and substratum type within the quadrat frame. No attempt was made to disturb substrata to observe organisms, and no attempt was made to identify

and enumerate cryptic species dwelling within the reef framework. Only macrofaunal species greater than approximately 2 centimeters were noted.

Following the period of fieldwork, quadrat photographs were projected onto a grid and units of bottom cover for each benthic faunal species and bottom type were recorded. Results of the photo-quadrats were combined with the in-situ cover estimates and community structure parameters (percent cover, species diversity) were calculated. The photo-quadrat transect method is a modification of the technique described in Kinzie and Snider (1978), and has been employed in numerous field studies of Hawaiian reef communities (e.g., Dollar 1979, Grigg and Maragos 1974), and has proven to be particularly useful for quantifying coverage of attached benthos such as corals and large epifauna (e.g., sea urchins, sea cucumbers). While this methodology is quantitative for the larger exposed fauna, many coral reef invertebrates are cryptic or nocturnal. Coupled with the generally small size of cryptic invertebrates, quantitative assessment of these groups requires methodologies that are beyond the scope of the present baseline assessment program.

Biotic Community Structure

Coral Communities

The predominant taxon of macrobenthos (bottom-dwellers) throughout the reef off the Kapalawai area are Scleractinian (reef-building) corals and benthic macroalgae. Results of qualitative reconnaissance surveys indicated that reef coral occurrence did not occur in the area off the stream that bisects the property owing to deposition of substantial reservoirs of red mud. To the north of the stream bed, the mud bottom decreased, grading into a reef platform composed of pitted limestone. On the reef platform, living coral abundance was relatively consistent along the northern portion of the Kapalawai property. Coral abundance also peaked within a zone approximately 50-100 m seaward of the reef crest in the region of the high relief limestone platform. With distance seaward, bottom topography flattened to a relatively featureless platform with low coral abundance.

Results of quantitative line transects conducted in two typical reef zones provide an estimate of coral community structure. Table 3 shows the quantitative summary of individual quadrat results from the transects, while Table 4 shows a summary of statistics drawn from the benthic transects. In total, eight species of "spongy" corals, were encountered on transects. Total coral cover was substantially higher on the shallower transects (30-32%) compared to the deeper transects ((2-3%) (Figure 6). The dominant species on the two north transects and the deep southern transect was *Porites lobata*, which accounted for about 37% of total coral cover. The other dominant species, especially on the

shallow southern transect was an encrusting coral identified as *Leptoseris* spp. This coral is generally not found in abundance in shallow water on Hawaiian reefs, and is usually limited to deeper water. The anomalously high abundance of the species is likely a result of the consistently high sediment loads in the nearshore waters (Figure 6). Other coral species encountered on transects included several forms of the genera *Montipora* (*M. verrucosa* and *M. patula*) and *Pocillopora* (*P. meandrina* and *P. damicornis*).

The growth form of most of the corals that were present in the study area consisted of flat encrustations or low sturdy lobate structures. Branching and vertically plated species were observed primarily on the sides of channel cuts.

Other Benthic Macroinvertebrates

The other dominant group of macroinvertebrates generally found on Hawaiian reefs are the sea urchins (Class Echinoidea). However, on the reefs surveyed off Kapalawai, urchins were very rare. The only urchin that was observed was *Echinometra mathaei*, which are small urchins that are generally found within interstitial spaces bored into the limestone substrata. Several Crown-of-thorns starfish (*Acanthaster planci*) were observed on the reef. Nearby bleached skeletons of colonies of *Pocillopora meandrina* suggested that the starfish had been feeding on these corals. Numerous sponge were also observed under ledges and in interstitial spaces. Several spiny lobsters (*Panulirus* spp.) were also observed under ledges.

Benthic Algae

Frondose benthic algae were common throughout the nearshore region. In addition, encrusting red calcareous algae (*Porolithon* spp., *Peysoneilia rubra*, *Hydroolithon* spp.) were common on exposed limestone surfaces throughout the study area. Dominant species of frondose algae observed on the reef included the genera *Dichyopteris*, *Dictyota*, *Sargassum*, and *Turbinaria*, and the red alga, *Amansia*, *Asparagopsis*, *Corallina*, *Laurencia*, *Liagora*, *Marfensia* and *Plocamium*. All of these plants occurred commonly on the limestone platform.

Reef Fish Community Structure

In general, reconnaissance surveys indicated that the reef fish community off the Kapalawai area was limited in numbers of both species and individuals. However, reef fish community structure was largely determined by the topography and composition of the benthos. Table 5 shows results of fish

censuses in the transect areas. On the outer flat reef platform, fish abundance was substantially lower than on the inner zones characterized by high vertical relief which affords shelter to fish. The most abundant fish throughout the survey area was the blue-lined snapper (*Acanthurus lineatus*). Most of the other fish observed were juveniles belonging mostly to the families Pomacentridae (damselfish), Acanthuridae (surgeonfish), with representatives from the families Labridae (wrasses), Mullidae (goatfish) and Chaetodontidae (butterfly fish). The complex habitat created by the eroded limestone reef provided limited shelter for small fish.

Overall, fish community structure off Kapalawai appeared depauperate when compared to assemblages found in relatively undisturbed Hawaiian reef environments. The lack of an abundant fish community suggests that either the area has been subjected to substantial amounts of fishing pressure, or the environmental conditions (e.g., suspended and deposited terrigenous sediments) result in a sub-optimal setting for fish.

Endangered and Protected Species

Three species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the island chain, and is known to feed on selected species of macroalgae. The endangered hawksbill turtle (*Eretmochelys imbricata*) also occurs, but is considered rare compared to the green turtle. Several green sea turtles were sighted on the surface and underwater during the surveys off Kapalawai. Many of the turtles sighted underwater were either swimming slowly near the bottom or resting within crevices or under ledges in the reef.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) are known to winter in the Hawaiian Islands from December to April. Hawaiian monk seals (*Monachus schauinslandi*) also occur occasionally in waters off the high islands. No monk seals were observed during the surveys off Kapalawai.

DISCUSSION and CONCLUSIONS

The ultimate purpose of marine baseline surveys is to estimate the potential for impact to marine environments from shoreline development. Implementation of the proposed plan for the Kapalawai Project would involve mass grading and vegetation removal associated with construction of the resort structures. Construction of roadways will also increase the amount of impervious surfaces compared to the present situation. However, there are no changes planned to the existing shoreline or

nearshore area. The overriding result of the marine environmental assessment is that at present, both water quality and biotic community composition are strongly influenced by terrigenous sediment in the nearshore ocean. This sediment appears to originate from runoff from the upland drainage basin, and maintains a long residence time within the shoreline bight known as Hoanuanu Bay. Hence, even if delivery of sediment is halted, it appears that the material presently on the bottom would remain in the system for an extended period of time. Water quality in the nearshore zone reflects high levels of suspended sediment that appears to be a consistent characteristic of the area regardless of season and weather. While coral communities occur in the outer reef area, it appears that the composition of the communities are strongly biased toward species that are sediment resistant. Similar variations in coral community structure have been documented by Roy and Smith (1971) who found that the presence of very turbid water and muddy bottom in the lagoon at Fanning Island did not prohibit the growth of corals. Reefs in the turbid water were different, in terms of species and growth forms, than reefs in the clear water but they were still living reefs.

Results of water chemistry surveys conducted off of the Kapalawai site reveal that a surface layer of low salinity, high nutrient groundwater occurs in the nearshore area as a result of efflux of groundwater. However, owing to rapid mixing, and the high level of suspended material in the nearshore zone, there is little response to the input of high nutrient water in terms of benthic algal growth. Plans for the Kapalawai Resort specify usage of an on-site wastewater treatment system that will employ an ultraviolet disinfecting process that will result in R-1 level effluent for use as an irrigation source on the property. As a result, none of the wastewater generated by the project will be discharged directly to the ocean.

It is anticipated that this method of wastewater disposal will have no impact to the marine environment for several reasons. In light of the observed substantial input of dissolved inorganic nutrients to the nearshore ocean as a result of existing groundwater fluxes that reflect current and past land uses, the small augmentation to groundwater from the proposed disposal of wastewater is likely to be undetectable or very small. In addition, the unrestricted circulation of the offshore zone by tidal and wind-driven currents, eddies, and wave action promotes rapid dilution and water exchange. While the residence time of deposited sediment appears relatively long, the residence time of a parcel of water fronting the development is probably on the order of hours to days, so long-term buildup of any dissolved constituent is unlikely.

While the planned project at Kapalawai may result in a temporary increase in exposed soil during the construction that could reach the ocean through runoff, it is likely that such an increase would be essentially undetectable when compared to the existing situation. The increased impervious

surfaces that will result from the construction of roadways on the property may actually reduce sediment delivery to the ocean as the roadways will replace erodable lands. Preliminary drainage calculations indicate that there are nearly 8,000 acres of off-site drainage within the basin containing the project property. Thus, the changes to the approximately 100 acres of the project site as a result of construction will have an insignificant impact to offshore water quality (see report by Wagner Engineering Services).

Potential Effects to Protected Species

As mentioned above, the threatened green turtle occurs in the nearshore areas off the project site. Because there is no plan for any work on the shoreline or in the nearshore region, there is no potential for activities that might affect health or behavior of turtles (or any other protected species).

As discussed above, potential changes in water quality that might occur as a result of construction would be undetectable, and hence would not affect turtle behavior.

As the shoreline bordering the property is sand, it is possible that turtles could haul ashore. Because the beaches on the development area are presently being used as recreation sites on a regular basis, any human-induced effects to turtle populations have probably already occurred. While it has not been documented that the area serves as a turtle nesting ground, such activities are potentially possible. In order to ensure that land use activities do not alter such potential behaviors, it is suggested that project lighting is designed so as not to illuminate the beach strand.

Similarly, the beach presents the possibility as a haul out area for monk seals. Transplanted seals have been documented to frequent many areas in the high islands (J. Naughton, NMFS, personal communication). As such, human intervention to endangered species populations has resulted in increasing the potential for interactions between humans and the endangered species. As a result, it appears that the Kapalawai area has the same potential for monk seal habitation as any other beach locale on Kauai.

In summary, the potential for impacts to marine communities as a result of development of the Kapalawai Resort appear to be minimal or nonexistent. None of the developmental activities appear to have the potential to induce long-term changes in physio-chemical water quality parameters of a magnitude sufficient to cause changes in biological community structure. Careful design of the project structures in terms of lighting should cause no effect to possible turtle behavior. The marine environments off Kapalawai (as is the case around much of the island of Kauai in regions where sugar cultivation takes place) appear to have been subjected to substantial sediment stresses for a

sufficient period of time (many decades) to have influenced community structure. Such stresses are much more destructive than the small temporary changes that could result from construction of the proposed development activity. If some unexpected event related to development activities does occur, the resulting alterations to marine community structure would probably be reversible and recovery rapid once the stress factor is mitigated. Tolerance to such changes appears to already be part of the physiological range of the community. It can be concluded that as long as reasonable steps are taken in construction practices, and because operational procedures for the project do not involve substantial changes in material delivery to the nearshore ocean, there should be no adverse impacts to the marine environment.

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TABLE 1. Results of water quality analyses from samples collected off the site of the proposed Kapalawai Resort project. Nutrient concentrations are in micromolar (μM) units. For Transect and station locations, see Figure 1. DFS = distance from shoreline in meters. "S" indicates surface sample; "B" indicates bottom sample.

TRANSECT	STATION NO.	DFS (m)	PO4 (μM)	NO3 (μM)	NH4 (μM)	Si (μM)	DOP (μM)	DON (μM)	TP (μM)	TN (μM)	TURB (ntu)	TSS ($\mu\text{g/L}$)	SALT (o/oo)	pH (rel)	Chl-a ($\mu\text{g/L}$)
SOUTH	1-S	1	0.36	1.62	2.61	13.83	0.29	7.71	0.65	11.94	1.30	16.43	34.713	8.13	2.392
	2-S	5	0.42	1.57	3.42	12.81	0.27	7.65	0.69	12.64	0.69	19.29	34.754	8.13	2.710
	3-S	10	0.41	1.48	3.74	12.14	0.28	7.24	0.69	12.46	0.92	18.43	34.786	8.12	2.803
	4-S	25	0.41	1.37	3.69	10.86	0.28	6.65	0.69	11.71	0.61	16.57	34.845	8.11	3.831
	5-S	50	0.19	0.74	1.26	7.28	0.31	7.73	0.50	9.73	0.66	14.57	35.031	8.09	1.565
	5-B	50	0.26	0.74	1.40	7.00	0.27	7.55	0.53	9.69	0.71	16.43	35.017	8.10	3.281
	6-S	100	0.28	0.96	1.45	8.54	0.28	7.55	0.56	9.96	0.54	10.29	34.957	8.10	1.217
	6-B	100	0.31	0.99	1.98	8.78	0.26	6.62	0.57	9.59	0.56	7.43	34.940	8.10	0.910
	7-S	200	0.21	1.28	0.65	11.07	0.27	6.45	0.48	8.38	0.53	12.57	34.821	8.09	1.011
	7-B	200	0.39	0.83	4.54	7.11	0.28	6.61	0.67	11.98	0.47	9.29	34.978	8.10	1.225
NORTH	1-S	1	0.20	1.77	0.18	25.60	0.27	6.17	0.47	8.12	1.75	58.29	34.084	8.19	3.415
	2-S	5	0.15	1.21	0.17	22.98	0.28	6.67	0.43	8.05	1.27	34.57	34.123	8.17	2.106
	3-S	10	0.13	0.93	0.21	21.93	0.28	7.52	0.41	8.66	0.81	14.57	34.113	8.15	0.772
	4-S	25	0.16	0.82	0.18	19.96	0.27	5.97	0.43	6.97	0.80	8.40	34.233	8.16	0.894
	5-S	50	0.08	0.05	0.09	5.28	0.27	6.08	0.35	6.22	0.29	1.87	34.948	8.10	0.898
	5-B	50	0.09	0.01	0.16	4.99	0.27	6.33	0.36	6.50	0.26	1.93	34.938	8.09	1.070
	6-S	100	0.06	0.06	0.13	5.93	0.29	5.80	0.35	5.99	0.22	0.43	34.960	8.10	0.659
	6-B	100	0.11	0.20	0.14	5.03	0.27	5.68	0.38	6.02	0.20	3.40	35.000	8.11	0.663
	7-S	200	0.12	0.33	0.22	5.55	0.28	6.53	0.40	7.08	0.21	2.87	35.009	8.11	0.684
	7-B	200	0.13	0.20	0.12	4.73	0.26	6.16	0.39	6.48	0.19	2.13	35.004	8.12	0.860
8-S	8-S	300	0.14	0.26	0.14	4.88	0.25	6.01	0.39	6.41	0.19	2.43	35.034	8.11	0.621
	8-B	300	0.10	0.10	0.15	4.19	0.25	6.34	0.35	6.59	0.17	0.57	35.112	8.12	0.592
	9-S	500	0.12	0.17	0.20	4.01	0.26	6.75	0.38	7.12	0.14	1.93	35.123	8.11	0.470
	9-S	500	0.10	0.11	0.30	3.43	0.26	5.90	0.36	6.31	0.12	0.29	35.158	8.12	0.894
	9-B	500	0.10	0.11	0.30	3.43	0.26	5.90	0.36	6.31	0.12	0.29	35.158	8.12	0.894

TABLE 2. Results of water quality analyses from samples collected off the proposed Kapalawai Resort project. Nutrient concentrations are in units of micrograms per liter (µg/L). For Transect and station locations, see Figure 1. DFS = distance from shoreline in meters. "S" indicates surface sample; "B" indicates bottom sample. DOH Water Quality Standards shown are for open coastal waters under wet conditions. Stippled values indicate exceedance of DOH 10% or 2% criteria.

TRANSECT	STATION NO.	DFS (m)	PO4 (µg/L)	NO3 (µg/L)	NH4 (µg/L)	SI (µg/L)	DOP (µg/L)	DON (µg/L)	TP (µg/L)	TN (µg/L)	TURB (ntu)	TSS (µg/L)	SALT (cf/oo)	pH (rel)	Chl-a (µg/L)
SOUTH	1-S	1	11.16	22.65	36.54	387.24	8.99	107.94	20.15	167.16	1.30	16.43	34.713	8.13	2.392
	2-S	5	13.02	21.95	47.85	358.68	8.37	107.10	21.39	176.96	0.69	19.29	34.754	8.13	2.710
	3-S	10	12.71	20.72	52.35	339.92	8.68	101.36	21.39	174.44	0.92	18.43	34.786	8.12	2.803
	4-S	25	12.71	19.16	51.66	304.08	8.68	93.10	21.39	163.94	0.61	16.57	34.845	8.11	3.831
	5-S	50	5.89	10.36	17.64	203.84	9.61	108.22	15.50	136.22	0.66	14.57	35.031	8.09	1.585
	5-B	50	8.06	10.36	19.60	196.00	8.37	105.70	16.43	135.66	0.71	16.43	35.017	8.10	3.281
	6-S	100	8.68	13.44	20.30	238.12	8.68	105.70	17.36	139.44	0.54	10.29	34.957	8.10	1.217
	6-B	100	9.61	13.86	27.72	245.84	8.06	92.68	17.67	134.26	0.56	7.43	34.940	8.10	0.910
	7-S	200	6.51	17.92	9.10	309.96	8.37	90.30	14.88	117.32	0.53	12.57	34.821	8.09	1.011
	7-B	200	12.09	11.62	83.58	199.08	8.68	92.54	20.77	167.72	0.47	9.29	34.978	8.10	1.225
	8-S	300	6.82	10.22	25.76	192.64	8.68	91.98	15.50	127.96	0.42	3.80	35.017	8.05	0.990
	8-B	300	6.82	5.04	21.42	116.48	8.68	83.02	15.50	109.48	0.22	0.87	35.136	8.12	0.969
9-S	500	3.72	5.88	3.08	135.80	8.99	82.04	12.71	91.00	0.20	0.93	35.096	8.10	0.483	
9-B	500	3.10	2.10	1.26	100.52	8.68	78.40	11.78	81.76	0.16	1.29	35.150	8.13	0.478	
NORTH	1-S	1	6.20	24.78	2.52	716.80	8.37	86.38	14.57	113.68	1.75	58.29	34.084	8.19	3.415
	2-S	5	4.65	18.94	2.38	643.44	8.68	93.38	13.33	112.70	1.27	34.57	34.123	8.17	2.106
	3-S	10	4.03	13.02	2.94	614.04	8.68	105.28	12.71	121.24	0.81	14.57	34.113	8.15	0.772
	4-S	25	4.96	11.48	2.52	558.88	8.37	83.58	13.33	97.58	0.80	8.40	34.233	8.16	0.894
	5-S	50	2.48	0.70	1.26	147.84	8.37	85.12	10.85	87.08	0.29	1.87	34.948	8.10	0.898
	5-B	50	2.79	0.14	2.24	139.72	8.37	88.62	11.16	91.00	0.26	1.93	34.938	8.09	1.070
	6-S	100	1.86	0.84	1.82	168.04	8.99	81.20	10.85	83.86	0.22	0.43	34.960	8.10	0.659
	6-B	100	3.41	2.80	1.96	140.84	8.37	79.52	11.78	84.28	0.20	3.40	35.000	8.11	0.663
	7-S	200	3.72	4.62	3.08	155.40	8.68	91.42	12.40	98.12	0.21	2.87	35.009	8.11	0.684
	7-B	200	4.03	2.80	1.68	132.44	8.06	86.24	12.09	90.72	0.19	2.13	35.004	8.12	0.660
	8-S	300	4.34	3.84	1.96	138.64	7.75	84.14	12.09	89.74	0.18	2.43	35.034	8.11	0.621
	8-B	300	3.10	1.40	2.10	117.32	7.75	88.76	10.85	92.26	0.17	0.57	35.112	8.12	0.592
9-S	500	3.72	2.38	2.80	112.28	8.06	94.50	11.78	99.68	0.14	1.93	35.123	8.11	0.470	
9-B	500	3.10	1.54	4.20	96.04	8.06	82.60	11.16	88.34	0.12	0.29	35.158	8.12	0.894	
DOH WATER QUAL. STDS.															
NOT TO EXCEED 10%			14.00	8.50					40.00	250.00	1.25				0.900
NOT TO EXCEED 2%			25.00	5.00					60.00	350.00	2.00				1.750

TABLE 3. Percent cover of coral species on transect quadrats off the proposed Kapalawai Resort.

TRANSECT SITE:		Kapalawai - North Transect 1 - 15'									MEAN CORAL COVER		30.4 %
DATE:		3/13/99									STD. DEV.		6.3
											SPECIES COUNT		7
											SPECIES DIVERSITY		1.27
SPECIES	QUADRAT										SPECIES TOTAL		
	1	2	3	4	5	6	7	8	9	10			
Porites lobata	14	28	4	26	6	28	63	6	2	6	18.3		
Porites compressa			6	2			6	2	3	2	2.1		
Montipora patula	6						2	2			0.6		
Montipora verrucosa						2				1	0.5		
Pocillopora meandrina			2	1	4				2		0.9		
Pavona duerdeni	5					11	12			6	3.4		
Leptoseris spp	10	4	2	6	8	4		4		8	4.6		
QUAD CORAL TOTAL	35	32	14	35	18	45	83	12	7	23	30.4		
Limestone	65	61	84	65	82	55	17	81	81	60	65.1		
Sand		7	2					7	12	17	4.5		
NON-CORAL TOTAL	65	68	86	65	82	55	17	88	93	77	69.6		

TRANSECT SITE:		Kapalawai - North Transect 2 - 24'									MEAN CORAL COVER		3.4 %
DATE:		3/13/99									STD. DEV.		1.9
											SPECIES COUNT		5
											SPECIES DIVERSITY		1.40
SPECIES	QUADRAT										SPECIES TOTAL		
	1	2	3	4	5	6	7	8	9	10			
Porites lobata		1	2	1	1	1		2	2	3	1.3		
Pocillopora meandrina	3				3	3					0.8		
Montipora patula								1			0.1		
Montipora verrucosa			1	1	1	2	1			1	0.7		
Pocillopora damicornis		1								3	0.4		
QUAD CORAL TOTAL	3	2	3	2	5	6	1	3	2	7	3.4		
Limestone	97	93	91	97	92	94	89	94	98	93	93.8		
Sand		5	6	1	3		10	3			2.8		
NON-CORAL TOTAL	97	98	97	98	95	94	99	97	98	93	96.6		

TRANSECT SITE:		Kapalawai - South Transect 1 - 17'									MEAN CORAL COVER		31.9 %
DATE:		3/14/99									STD. DEV.		10.5
											SPECIES COUNT		6
											SPECIES DIVERSITY		0.59
SPECIES	QUADRAT										SPECIES TOTAL		
	1	2	3	4	5	6	7	8	9	10			
Porites lobata			1			1	4	1	31	4	4.2		
Porites compressa		2									0.2		
Montipora verrucosa						1					0.1		
Pocillopora meandrina	3										0.3		
Pavona duerdeni	5										0.5		
Leptoseris spp	22	16	33	73	5	21	34	28	28	6	26.6		
QUAD CORAL TOTAL	30	18	34	73	5	23	38	29	59	10	31.9		
Limestone	45	82	62	27	72	77	62	66	41	88	62.2		
Sand	25		4		23			5		2	5.8		
NON-CORAL TOTAL	70	82	66	27	95	77	62	71	41	90	68.1		

TRANSECT SITE:		Kapalawai - South Transect 2 - 25'									MEAN CORAL COVER		1.7 %
DATE:		3/14/99									STD. DEV.		0.6
											SPECIES COUNT		5
											SPECIES DIVERSITY		1.20
SPECIES	QUADRAT										SPECIES TOTAL		
	1	2	3	4	5	6	7	8	9	10			
Porites lobata	1	1	1	2	1	1		1	1	1	1.0		
Pocillopora meandrina			1		1	1					0.3		
Montipora patula								1			0.1		
Montipora verrucosa							1		1		0.2		
Pocillopora damicornis						1					0.1		
QUAD CORAL TOTAL	1	1	2	2	2	3	1	2	2	1	1.7		
Limestone	97	98	98	98	98	97	93	93	94	94	96.0		
Sand	2	1					6	5	2	3	1.9		
NON-CORAL TOTAL	99	99	98	98	98	97	99	98	96	97	97.9		

TABLE 4. Percent coral cover, non-coral cover, and coral community statistics calculated from transect quadrats surveyed off the proposed Kapalawai Resort. For Station locations, see Figure 1.

CORAL SPECIES	TRANSECT			
	N-15'	N-24'	S-17'	S-25'
Porites lobata	18.3	1.3	4.2	1.0
Porites compressa			0.2	
Pocillopora meandrina	0.9	0.9	0.3	0.3
Pocillopora damicornis		0.4		0.1
Montipora verrucosa	0.5	0.7	0.1	0.2
Montipora patula		0.1		0.1
Pavona duerdeni	3.4		0.5	
Leptoseris spp.	4.6		26.6	
TOTAL CORAL COVER	30.4	3.4	31.9	1.7
NUMBER OF SPECIES	7	5	6	5
CORAL COVER DIVERSITY	1.27	1.40	0.59	1.20
NON-CORAL SUBSTRATUM	69.6	96.6	68.1	97.9

TABLE 5. Reef fish abundance on transects off the proposed Kapalawai Resort. For location of sampling station, see Figure 1.

FAMILY Species	TRANSECT			
	N-15'	N-24'	S-17'	S-25'
CIRRHITIDAE				
Paracirrhites arcatus	2		1	
P. forsteri				
MULLIDAE				
Parupeneus multifasciatus	7		3	
P. cyclostomus				
LUTJANIDAE				
Lutjanus kasmira	40	4	35	3
CHAETODONTIDAE				
Chaetodon quadrimaculatus	2	3		
C. unimaculatus	2	11	2	2
C. multicinctus		8	6	2
POMACENTRIDAE				
Plectro. johnstonianus	2			
Plectro. imparipennis				2
Stegastes fasciolatus	7			4
Chromis vanderbilti	6	2	8	
C. hanui	2		1	
C. agilis	1			
C. ovalis	2		2	
LABRIDAE				
Bodianus bilunulatus	1	1	1	
Thalassoma duperrey	2		1	
Halichoeres ornatissimus	1	1		
ACANTHURIDAE				
Acanthurus olivaceus	2	3		
A. nigrofuscus	2	1		
A. blochii	3			1
A. triostegus	2		1	
Ctenochaetus strigosus	3	1	1	
BALISTIDAE				
Sufflamen bursa	2	1	2	1
Melichthys niger	1		1	
TETRADONTIDAE				
Canthigaster jactator		1		
NUMBER SPECIES	21	12	14	7
NUMBER INDIVIDUALS	92	37	65	15
SPECIES DIVERSITY	2.26	2.08	1.72	1.84

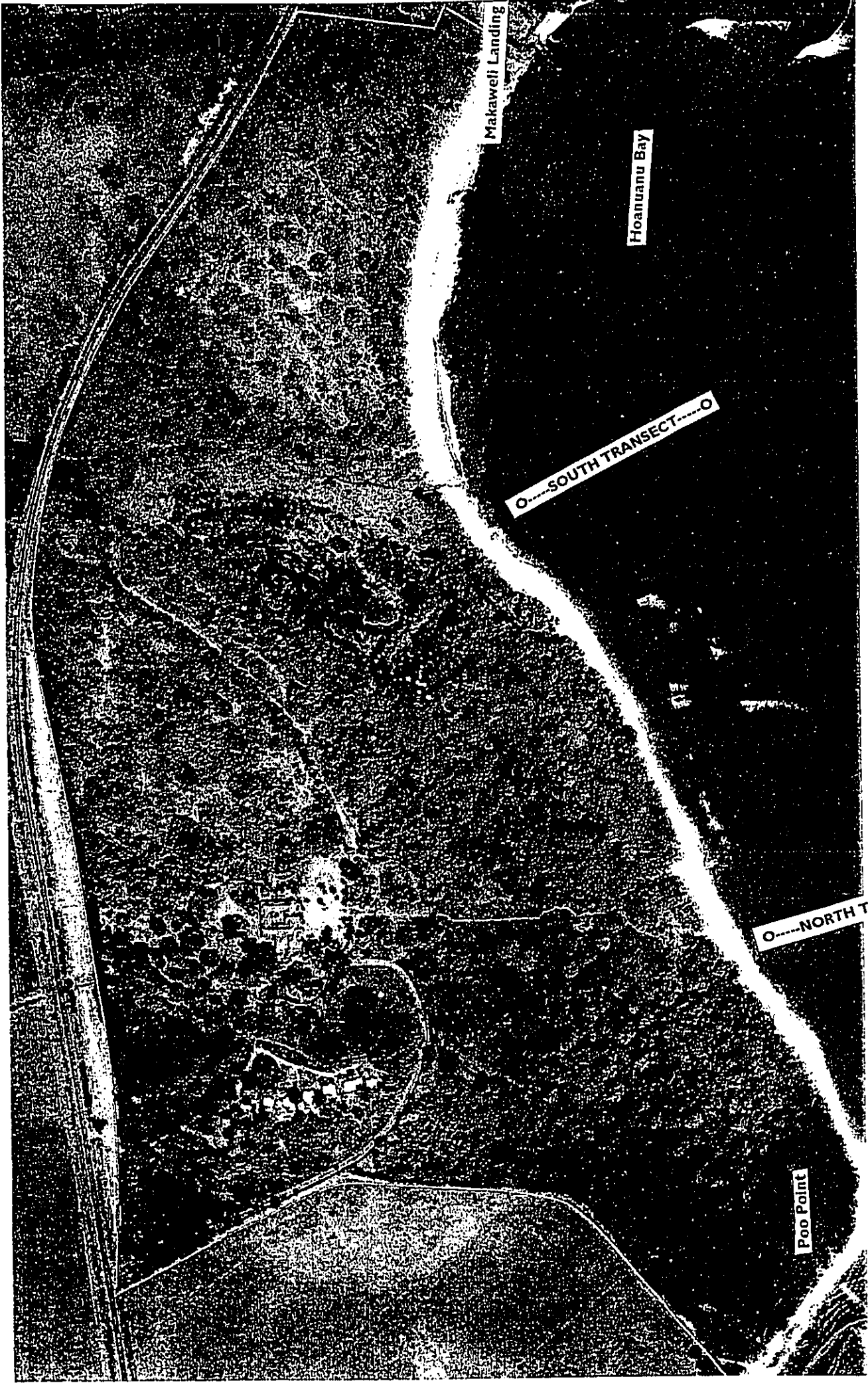


FIGURE 1. AERIAL PHOTOGRAPH OF KAPALAWAI RESORT PROPERTY (BOUNDARIES SHOWN IN RED) ALSO SHOWN ARE LOCATIONS OF NORTH AND SOUTH WATER QUALITY AND BIOTIC SURVEY TRANSECTS.

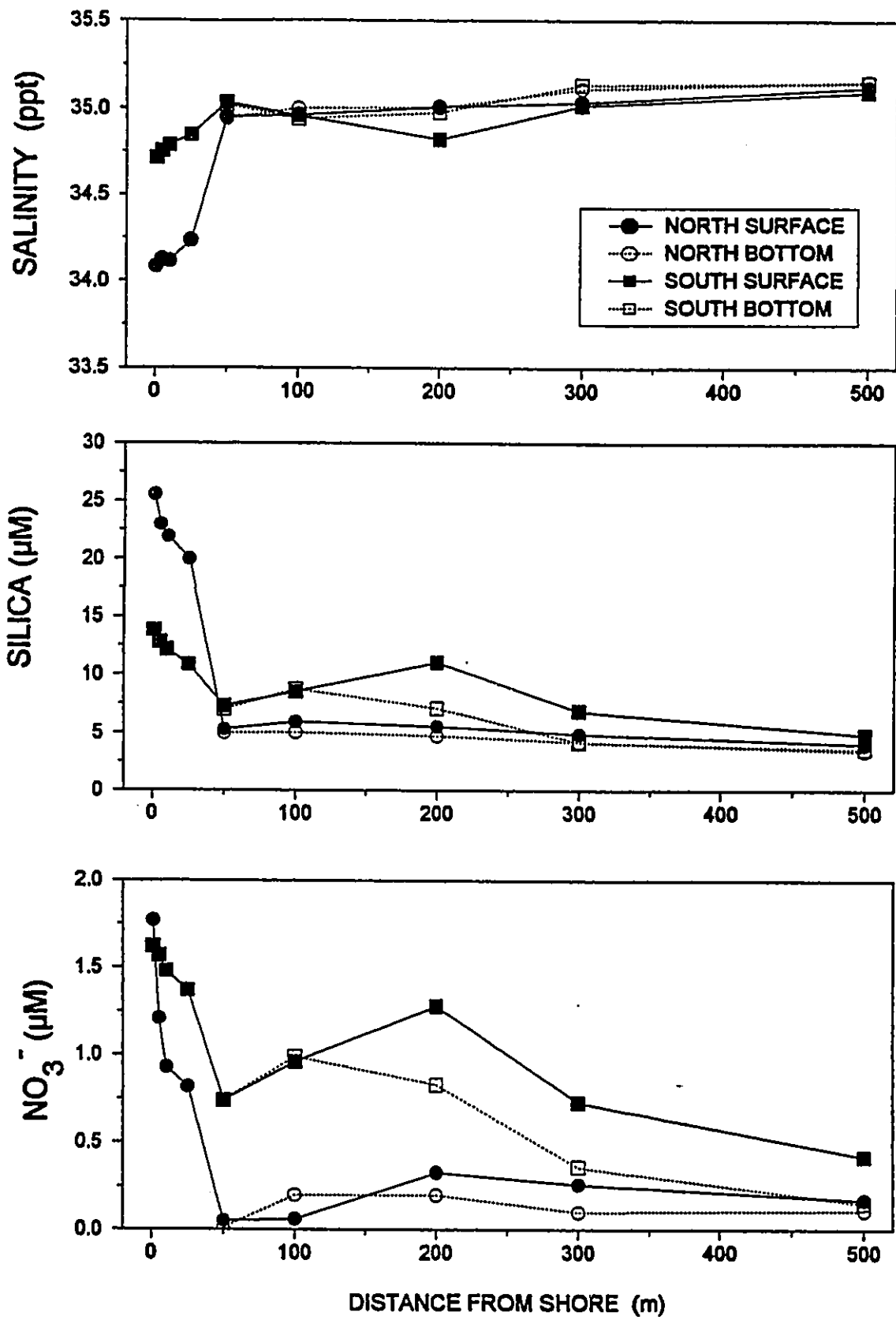


FIGURE 2. Plots of salinity, silica and nitrate nitrogen in surface and bottom samples collected on two ocean transects off the proposed Kapalawai Resort on the southwest coast of Kauai. For transect locations, see Figure 1.

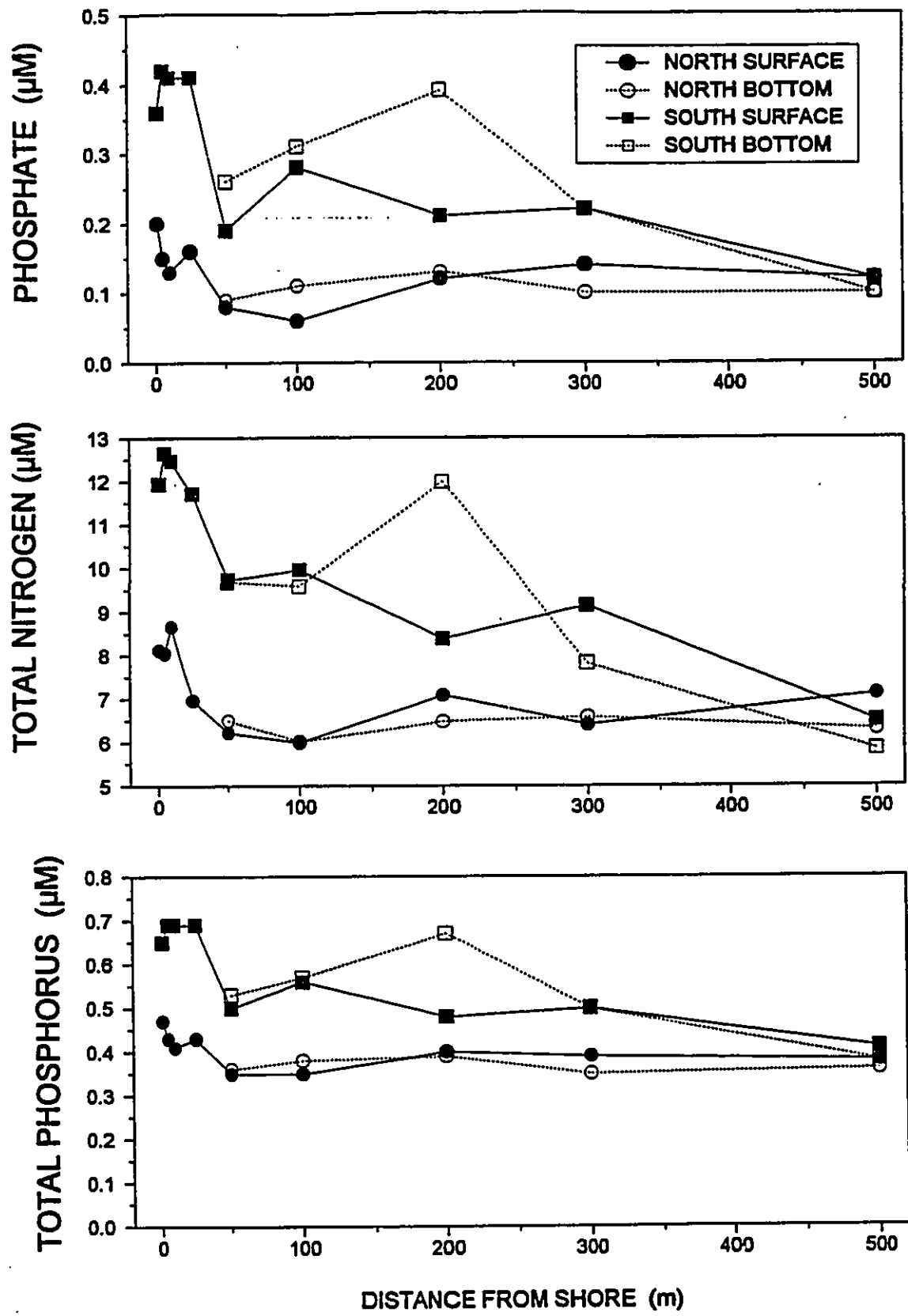


FIGURE 3. Plots of phosphate, total nitrogen and total phosphorus in surface and bottom samples collected on two ocean transects off the proposed Kapalawai Resort on the southwest coast of Kauai. For transect locations, see Figure 1.

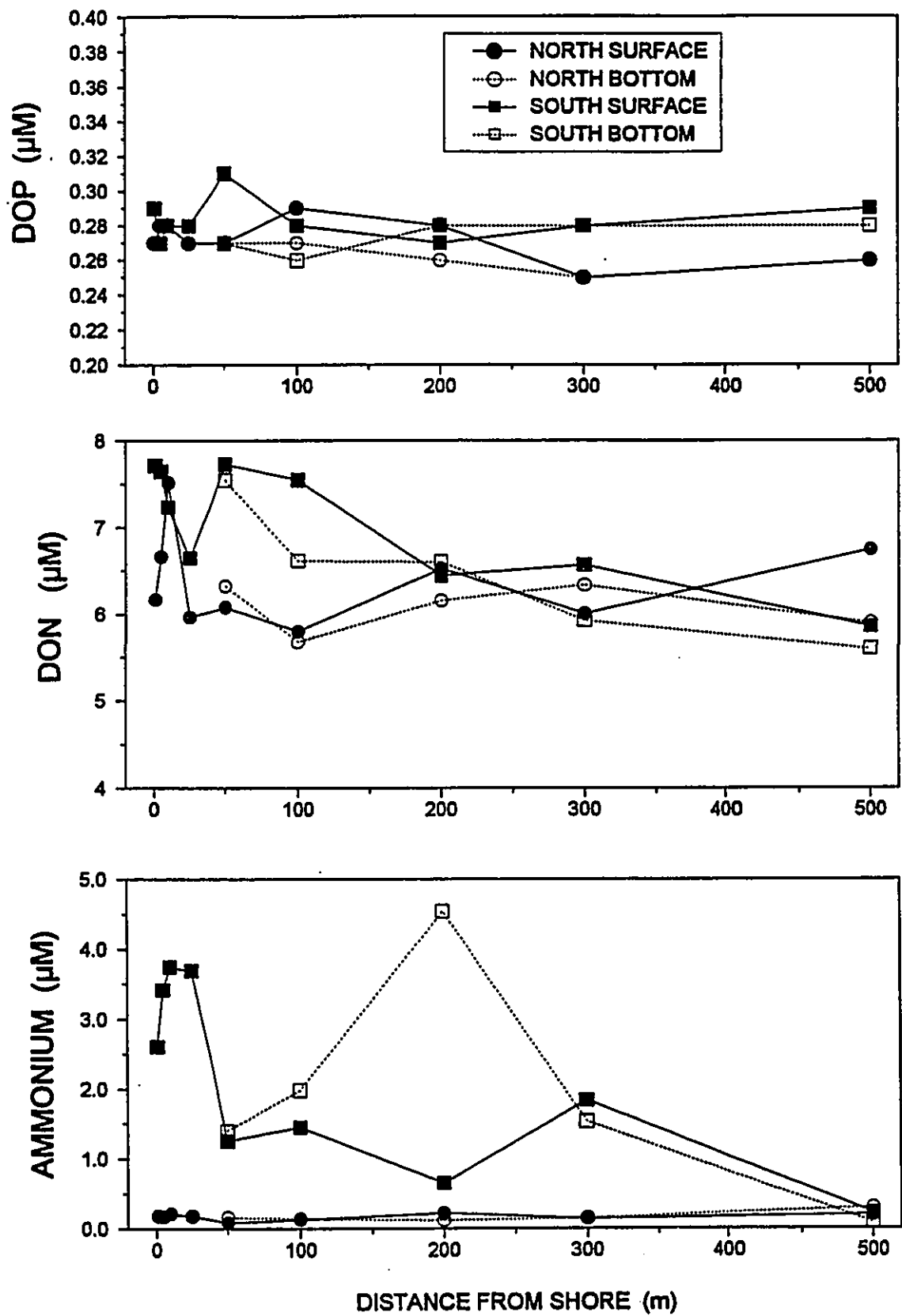


FIGURE 4. Plots of dissolved organic phosphorus and nitrogen (DOP, DON), and ammonium in surface and bottom samples collected on two ocean transects off the proposed Kapalawai Resort on the southwest coast of Kauai. For transect locations, see Figure 1.

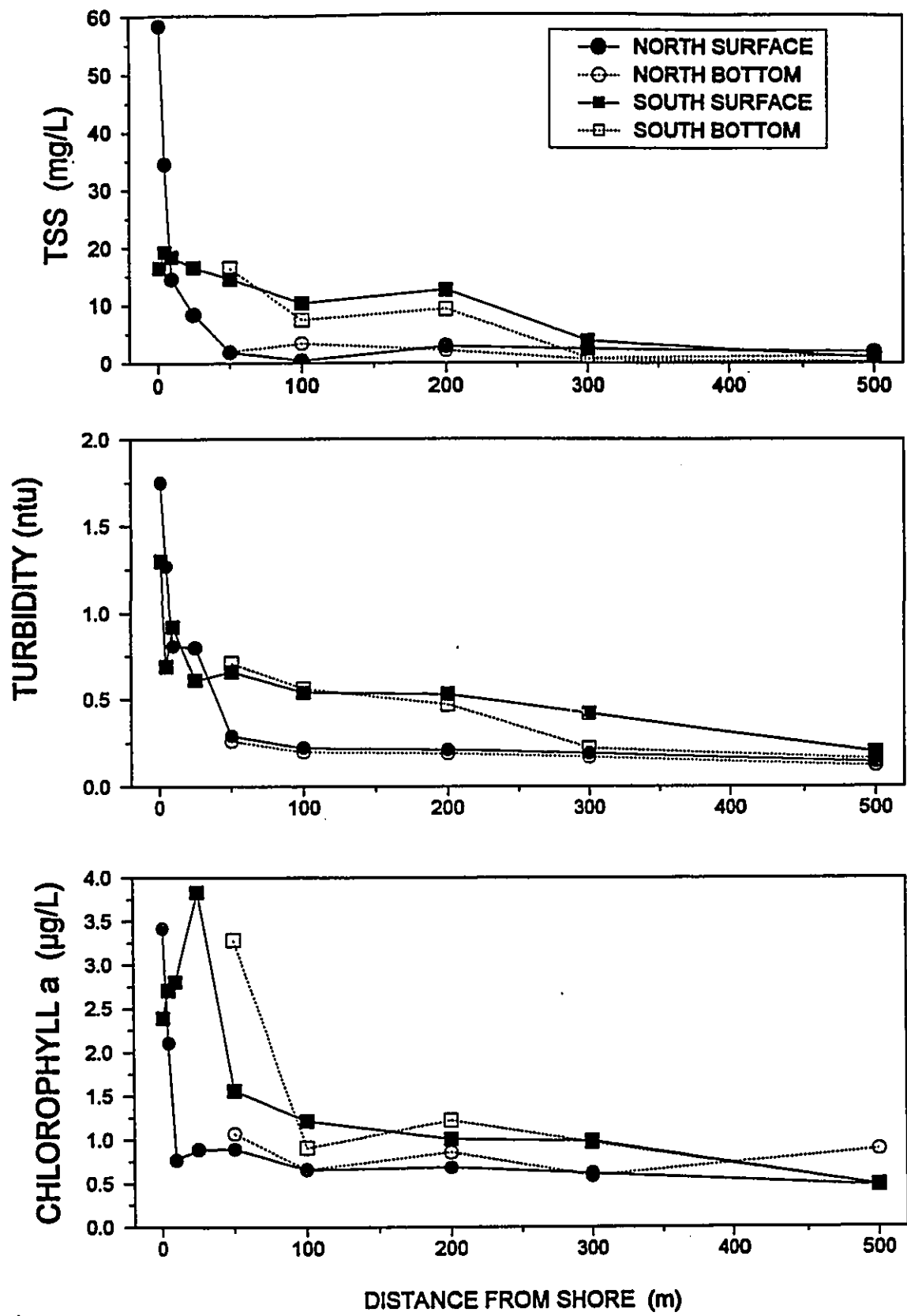


FIGURE 5. Plots of total suspended solids (TSS), turbidity, and Chlorophyll a in surface and bottom samples collected on two ocean transects off the proposed Kapalawai Resort on the southwest coast of Kauai. For transect locations, see Figure 1.

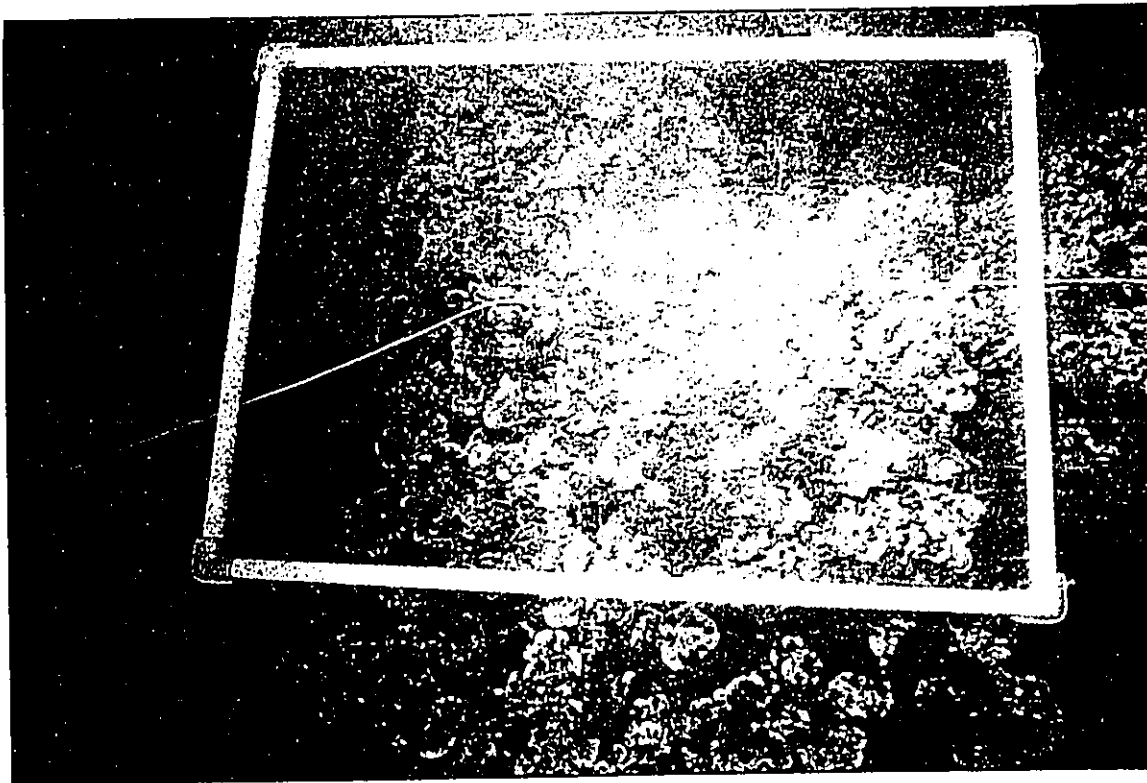
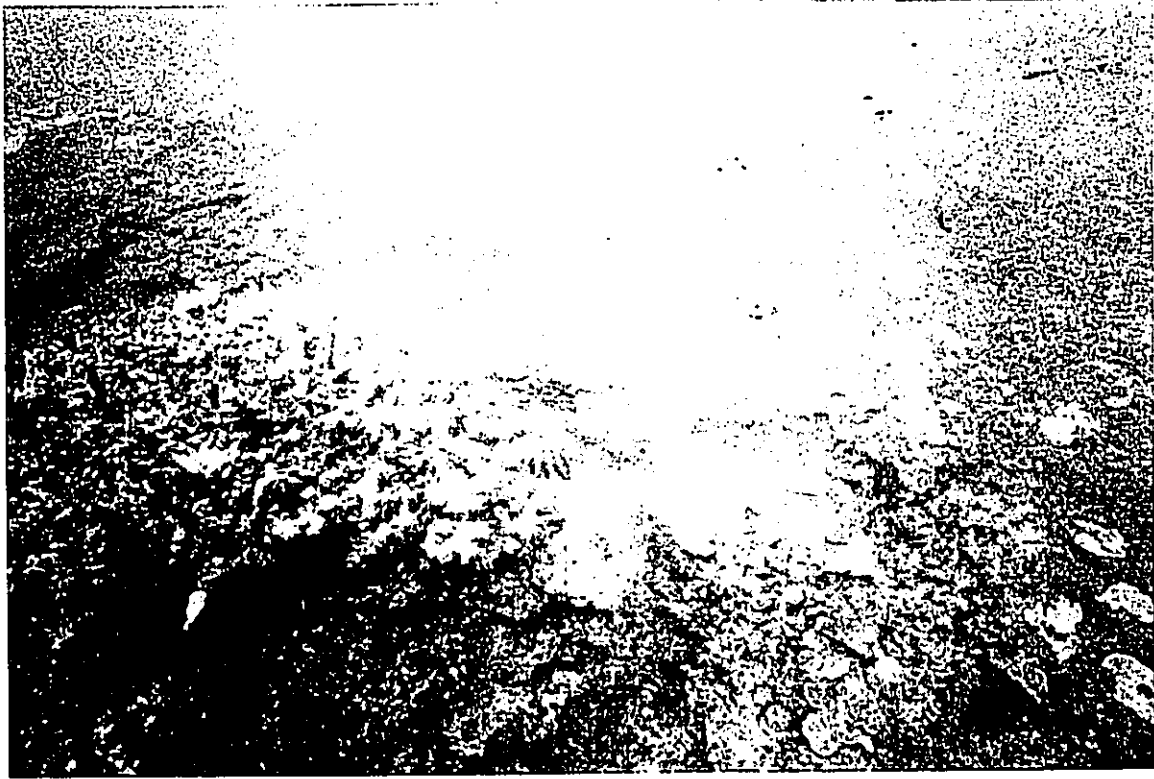


FIGURE 6. Oblique view of surface of reef platform off Kapalawai Kauai seaward of reef crest (top). Note Crown-of-thorns starfish in center of photo. Bottom photograph shows quadrat photograph from shallow south transect showing abundant growth of *Leptoseris* spp. Brown material between corals is layer of red mud.



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ARCHAEOLOGICAL
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CULTURAL SURVEYS HAWAII

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ABSTRACT

At the request of Helber, Hastert & Fee, Planners, Inc., Cultural Surveys Hawaii, Inc. performed an archaeological inventory survey of a property in Kapalawai, Kaua'i, Hawaii (TMK 1-7-05: Por. 1). The property is an approximately 170-acre parcel bounded to the north by Kaunualii Highway, to the south by the shoreline, to the east by A'akukui stream, and to the west by a rock wall which separates the parcel from a corn field. During the inventory survey, 6 sites were recorded and registered with the State Historic Preservation Division. State Site # 50-30-9-762 is a series of rock walls and a terrace. State Site # 50-30-9-763 is a 48.5m (155 ft.)¹ by 23m (73.5 ft.) stone platform. State Site # 50-30-9-764 is a housing complex consisting of 14 historic buildings. State Site # 50-30-9-765 is the 6-acre Kekupua Fishpond. State Site # 50-30-9-766 is a Portuguese brick oven. State Site # 50-30-9-792 is a subsurface cultural layer, which includes a human burial.

¹ an acre = 4,047m² or 43,560 square feet.

² All U.S. equivalents of metric units greater than one foot in length are rounded off to the nearest 6 inches where 1 inch = 2.5 cm.

Throughout this report the spelling of Hawaiian vocabulary and place names has been standardized according to present orthography.

**ARCHAEOLOGICAL INVENTORY SURVEY
REPORT FOR 170 ACRES INCLUDING
A 6-ACRE INLAND FISH POND FOR THE
PROPOSED KAPALAWAI RESORT,
KAPALAWAI, KAUA'I, HAWAII
(TMK 1-7-05:POR. 1)**

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Cultural Surveys Hawaii
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I. INTRODUCTION

A. Project Background

At the request of Heiber, Hastert & Fee, Planners, Inc., Cultural Surveys Hawai'i, Inc. performed an archaeological inventory survey of an approximately 170-acre coastal parcel in Kapalawai, Kaua'i, Hawai'i (TMK 1-7-05: For.1). The property belongs to the Robinson-Gay Family and has been used over the last 100 years primarily as a family residence and for cattle ranching. The parcel is proposed for resort development to include the renovation of existing structures and the construction of guest cottages. This inventory survey report documents and provides significance evaluations for the historic properties within the parcel. It also provides mitigation recommendations for all historic properties in light of the proposed development.

The field work and report writing for an earlier draft of this report was completed in the first half 1999. This earlier draft inventory survey report was reviewed by the Department of Land and Natural Resources/State Historic Preservation Division (DLNPSHPD) and the Environmental Center at the University of Hawaii. All review comments and suggestions have been addressed in this version of the report, including the suggestion for additional testing to identify subsurface cultural deposits. Besides many minor clarifications and additions, this updated report contains the results of 3 days of subsurface backhoe testing, which was conducted at the end of January 2000.

B. Project Area Description

The project area is a beachfront property located in the *'ili* of Kapalawai in the *ahupua'a* of Makaweli in the Kona district on the island of Kaua'i (Figures 1-5). It is a gently sloped piece of land between the shoreline and Kaunua'i Highway. The shoreline is the southern boundary of the entire project area. Between the highway and the project area is a narrow strip of land currently planted in sugarcane. The old government road lies between this cane field and the property. The northern boundary is demarcated in part by a rock wall (State Site # 50-30-9-762 Feature C). This wall ends north of the bridge spanning the Waipso Stream (also called Mahaikona Stream, variously spelled Mahakona, Mahaikona). This stream is commonly referred to as Mahikona Stream which it will be called in this report. The property north of the Mahikona Stream is not visible from the highway due to a very dense and colorful bougainvillea growth covering the wall. The southern half of the *mauka* boundary (south of Mahikona Bridge) is marked by a barbed wire cattle fence. This fence crosses Mahikona Stream to the west and A'akukui Stream to the east. The A'akukui Stream is the eastern boundary of the project area. Mahikona Stream is perennial, while A'akukui flows year-round at the upper reaches and intermittently at lower levels. There is no native stream life listed at present for either of these streams (Wilcox *et al.*, 1990: 174). However, *'o'opu* were once considered sacred in the streams of Makaweli. (HEN Notes I, p 1582, Bishop Museum Archives). Between the two streams is the coastal plain of Kekupua Valley. The soil in this area is sandy, and mostly covered with old and new growth *kiawe* trees. The terrain is relatively flat. The

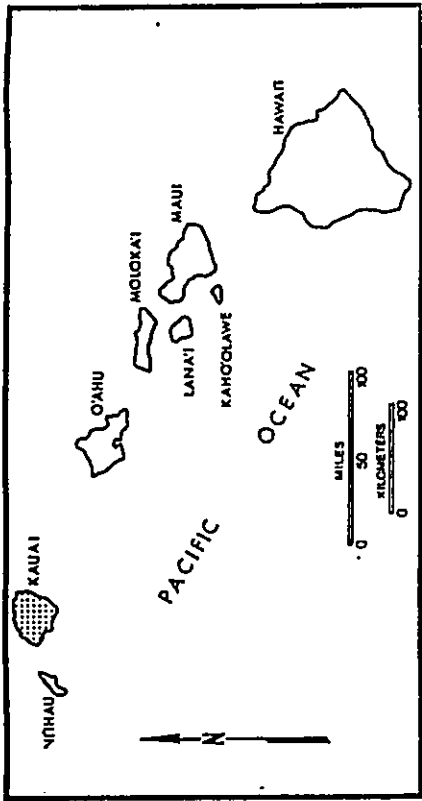


Figure 1 State of Hawaii

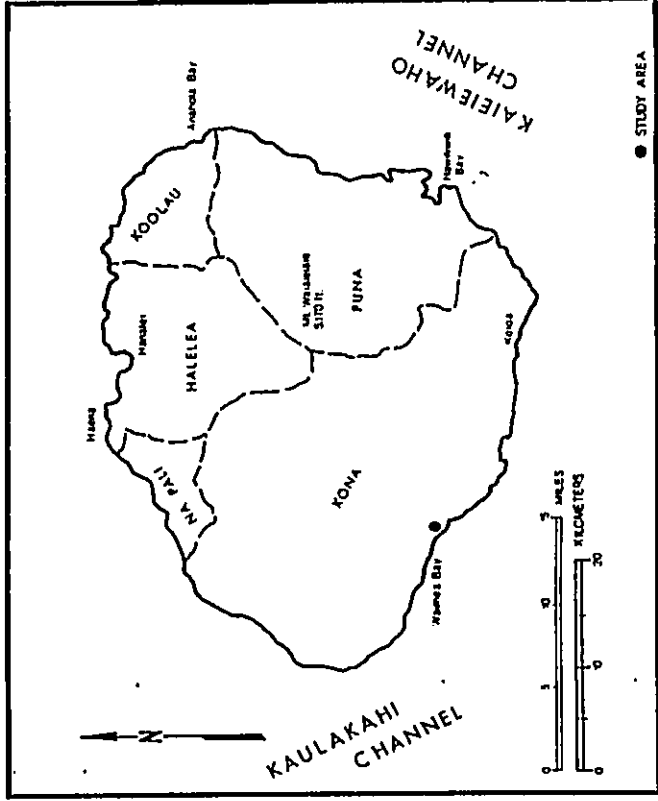


Figure 2 General Location Map, Kauai Island

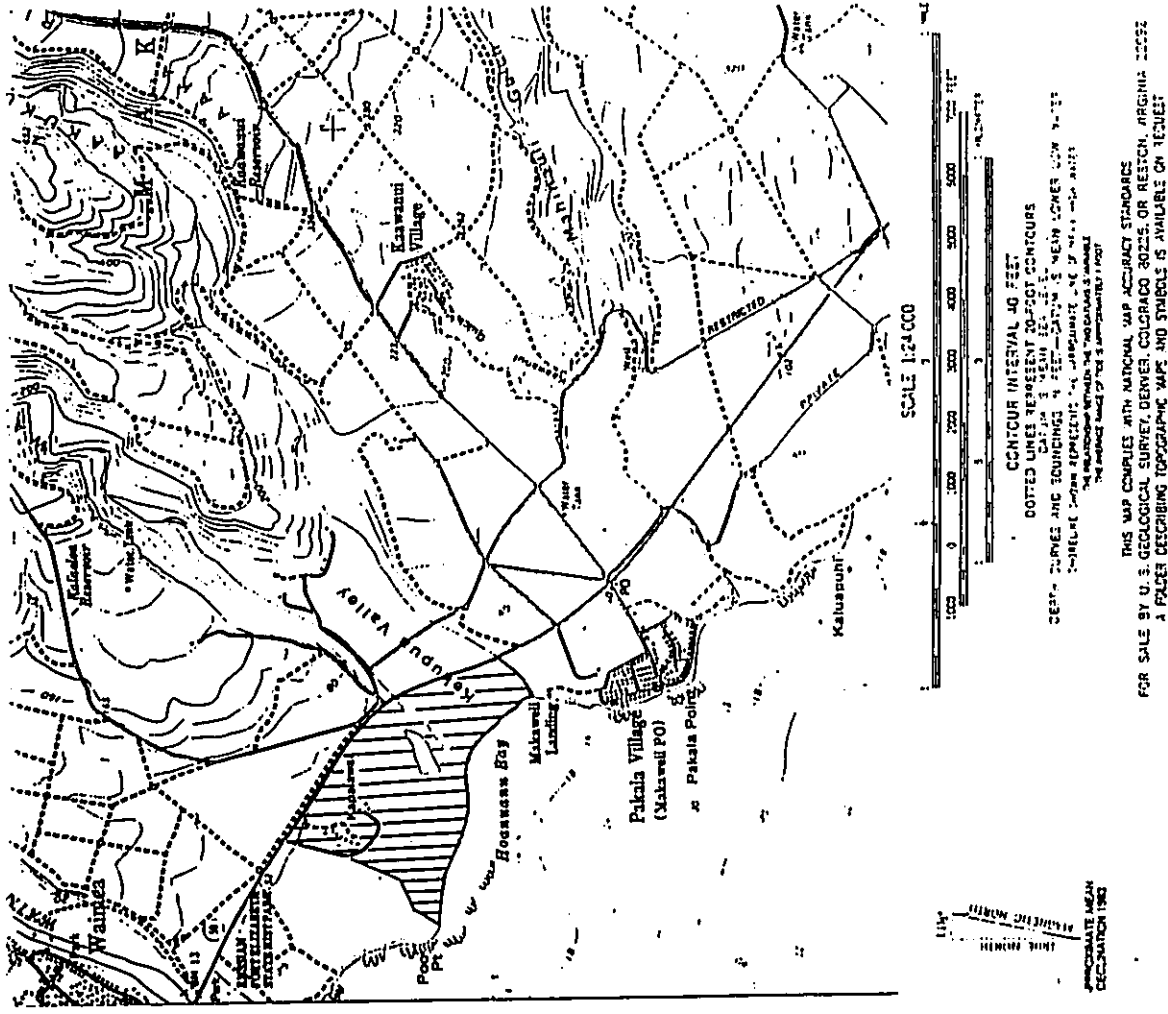


Figure 3 Portion of USGS 7.5 Minute Series, Hanapepe Quad, Showing Project Location

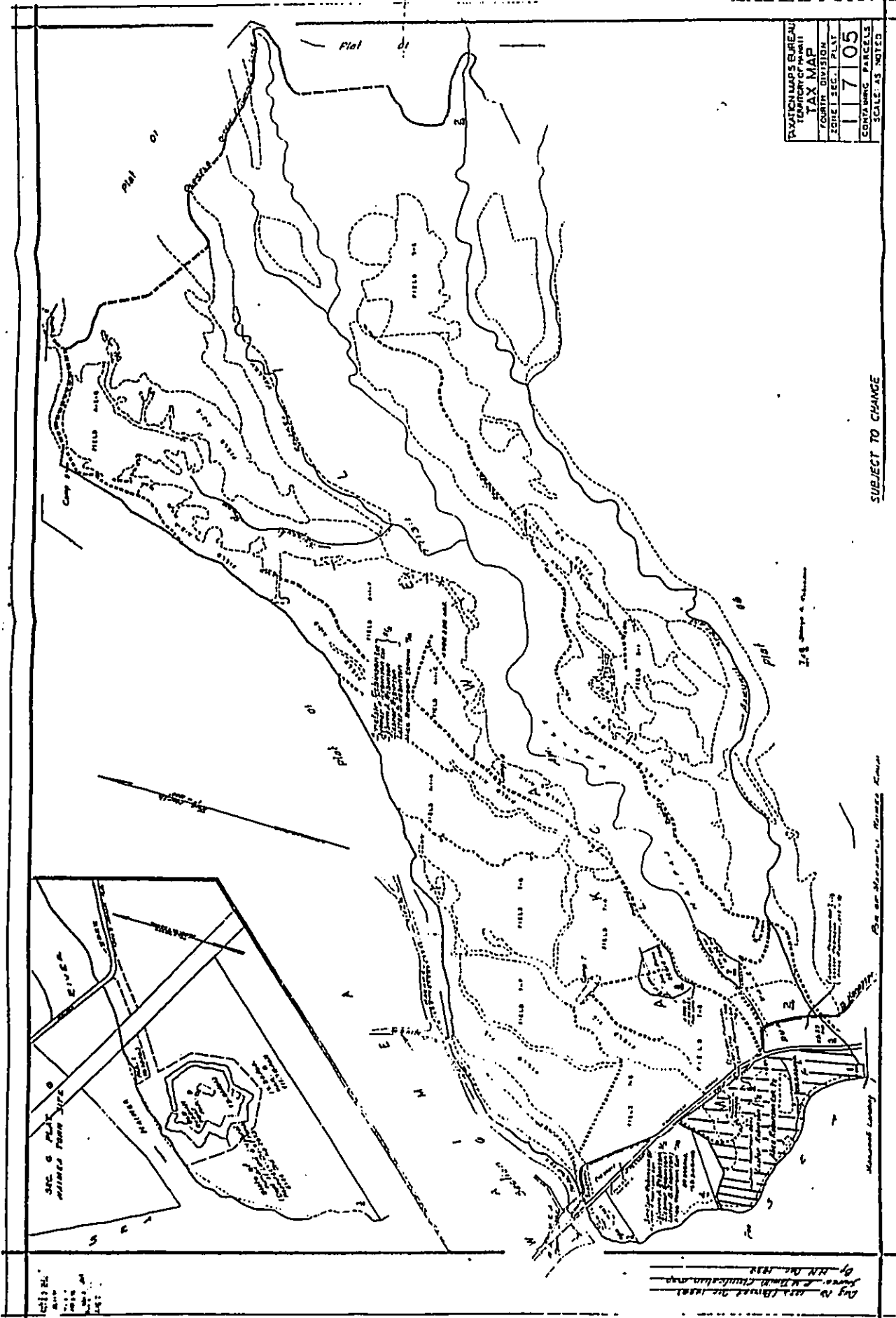


Figure 4 TMK 1-7-05 Showing Project Location



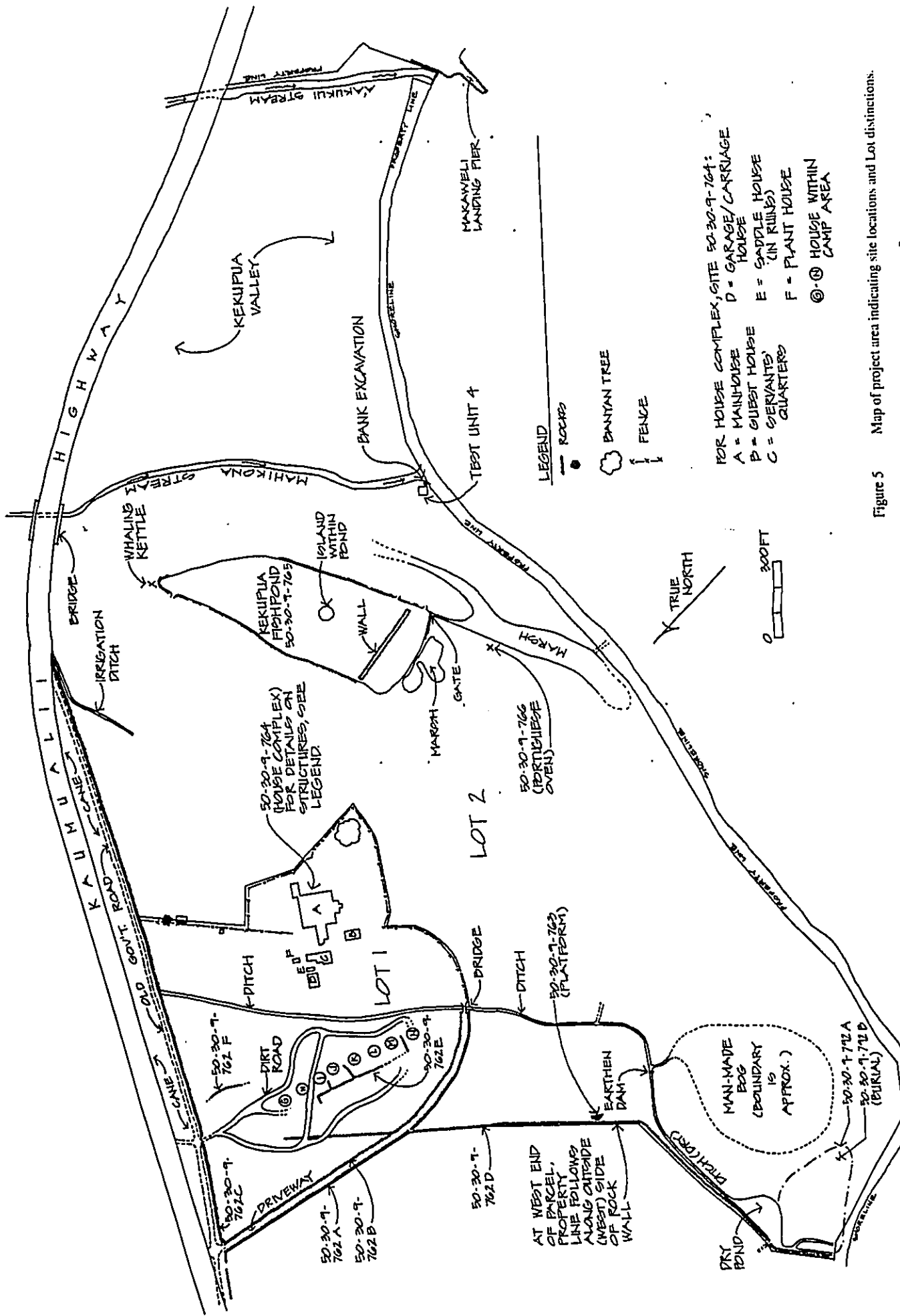


Figure 5 Map of project area indicating site locations and Lot distinctions.

area between the two streams from the highway to the ocean is currently used for cattle grazing. The many wallowing pits observed were checked during the inventory survey for cultural deposits. At the time of the inventory survey several bulls were encountered within this parcel (see Figure 22 below).

Outside of Kekupua Valley and to the west of Mahikona Stream the terrain has been clearly modified. There are dirt roads that traverse a cleared pasture (see Figure 23 below). At the time of the survey, the property was being cleared of hurricane-felled trees and selected vegetation to restore large open areas within the pasture (see Figures 24 & 25 below). Along the northern boundary, remnants of a cattle ranch can be observed. Collapsed wooden fences, a network of irrigation pipes, and remnants of historic structures are scattered across the terrain. Near here is a surface artifact of interest. A kettle that measures 1.10 m (3.5 ft.) wide by 1m (3 ft.) wide by .70 m (2 ft.) high rests on the ground. The artifact is known as an iron try-pot, and is in fair condition (see Figure 26 below & Appendix 1). West of and adjacent to Mahikona Stream is Kekupua Fishpond, a 6-acre inland fishpond (State Site # 50-30-9-765). Mahikona Stream runs along the eastern side of the fishpond and drains into the ocean. This pond is fed by natural springs (at least three are known), and drains to the southwest where it is currently obstructed from flowing into the ocean. The shoreline is beach sand with a slight rise at the back of the beach and enough of a depression behind the rise to cause water to collect from the fishpond area. This has created a marsh-like environment. On the bank above the lower marsh area is a brick oven (State Site # 50-30-9-766) that is in good shape. Along the shoreline behind the beach sand is a wide band of vegetation which creates a natural barrier between the public beach and the private property (see Figure 27 below). Further west across the project area the recent clearing is more pronounced. There is a clear line of sight from the main house across the pasture to the ocean (see Figure 28 below). Remaining in the pasture are clusters of old growth trees and vegetation covered with bougainvillea. It was pointed out that for a long time the lower branches of the trees were removed to allow for a person on horseback to pass more easily under them (see Figure 29 below). In the southwestern corner of the project area is a man-made bog. It is fed by a ditch that collected irrigation runoff from mauka sugar fields. This waterway used to flow along the westernmost portion of the project area, but is now dried up since a retention berm was constructed. The western boundary of the project area is a rock wall (State Site # 50-30-9-762 Feature D). This wall makes several turns, and does not run all the way to the ocean. Rather, a barbed wire fence extends the last section to the beach. To the west of the wall is an agricultural area of planted corn. The boundaries are clear around the entire perimeter of the project area. Further mauka along the wall is a large rock platform (State Site # 50-30-9-763).

The northwest corner of the project area is protected from the pasture surrounding it by a fence. It is delineated on the project area map by a solid line (fence line) and comprises approximately 26 acres. This section of the project area will be referred to as Lot 1. The rest of the project area (previously described) constitutes Lot 2 (see Figure 5 above). Lot 2 comprises approximately 144 acres. The purpose of the fence that surrounds Lot 1 is to keep the free range cattle in Lot 2 (only bulls were observed) from entering. Lot 1 is protected from the pasture because it is where people currently reside and garden. Within

Lot 1 is the main house complex with its landscaped grounds (State Site # 50-30-9-764). Part of the main house complex is the driveway which is lined with rock walls (State Site # 50-30-9-762 Features A&B). The ditch that feeds the bog runs through Lot 1 and under a bridge in the driveway. Alongside the driveway is a horse corral presently in use. Separated from the main house complex by dense vegetation is a workers camp (see Figure 30 below). This area is accessed from Kaunualii Highway. Within the camp are 8 workers houses, a series of dirt roads, a series of rock walls (State Site # 50-30-9-762 Feature E), a rock terrace (State Site # 50-30-9-762 Feature F), modern *lo'i*, and gardens (see Figure 31 below).

C. Scope of Work

The following Scope of Work applies to the present study:

1. A complete ground survey of the entire project area for the purpose of site inventory. All sites would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected sites and complexes. All sites will be assigned State site numbers.
2. If warranted, limited subsurface testing to determine depth and quantity of cultural materials within archaeological sites and to obtain datable samples for chronological information if none is available for sites in the immediate area from previous studies.
3. Research on historic and archaeological background, including search of historic maps, written records, Land Commission Award documents. This research will focus on the specific area with general background on the *ahupua'a* and district and will emphasize settlement patterns.
4. Preparation of a survey report which will include the following:
 - a. A map of the survey area showing all archaeological sites and site areas;
 - b. Description of all archaeological sites with selected photographs, scale drawings, and discussions of function;
 - c. Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the archaeological features;
 - d. A summary of site categories, describing their significance in an archaeological and historic context;

- e. Recommendations based on all information generated which will specify what steps should be taken to mitigate impact of development on archaeological resources - such as data recovery (excavation) and preservation of specific areas. These recommendations will be developed in consultation with the client and the State agencies.

This scope of work also includes full coordination with the State Historic Preservation Division (SHPD), and Kauai County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

D. Methods

1. Pedestrian Inspection

The entire project area was surveyed between Feb. 8 and 19, 1999. The daily field crew comprised four archaeologists and included, at various times: Kaipo Akana, Anthony Bush, Gerald Ida, Ka'ohulani McGuire, David Shideler, and Loren Zulick. The survey commenced in the northwest corner of Lot 2, and proceeded southwesterly following a 220° bearing in controlled sweeps. The archaeologists were spaced 15m (50 ft.) apart and followed the western rock wall boundary southwest to the ocean. The sweeps continued using the existing pasture fence and driveway as a northern boundary. As the crew moved across Lot 2 towards the southeast (to Hanapēpē) the fence around Lot 1 then a dirt road were used as northern boundaries. When the crew reached Mahikona Stream the practical northern boundary became Kaumuali'i Highway.

Between Mahikona Stream and A'akukui Stream the sweeps ran from Kaumuali'i Highway to the ocean. When the eastern boundary (A'akukui Stream) was reached, the crew went back to the central portion of the project area (east of Lot 1). Here, the sweeps were conducted from a dirt road, north to the bougainvillea-covered northern boundary wall. The rock wall parallels Kaumuali'i Highway. The eastern boundary of these sweeps was a dirt access road. The western boundary was the fence surrounding Lot 1. This concluded the archaeological survey of Lot 2. Next, the contents of Lot 1 were inventoried. Lot 1 is an area at the north corner of the parcel that is bounded by a cattle fence and includes the main house complex, and the inhabited workers camp. Again, sweeps were performed within existing man-made boundaries (walls and fences) to get as much coverage as possible within lot 1. Some areas within this parcel could not be accessed. Specifically, the dense bougainvillea could not be penetrated so it was spot-checked in accessible areas. The majority of the rock wall paralleling Kaumuali'i Highway is covered with bougainvillea; as a result, the wall and its condition are mostly hidden from inspection. There were dense concentrations of elephant grass and flooded ground along the eastern side (interior) of the rock wall on the Hanapēpē side of the driveway. The flooding was the result of modern *lo'i* cultivation within the camp compound. Also within Lot 1 were large concentrations of prickly pear cactus on a rock terrace (State Site # 50-30-9-762 Feature F). This vegetation was skirted and its interior viewed from the perimeter since visibility was good around this plant. There were other areas within the project

parcel where accessibility was limited due to natural obstacles. Inside Lot 2 there were a number of large bougainvillea bushes. Due to the thorny nature of the flowering plant these areas were spot-checked where access was feasible. Several large vegetation clearing piles were located within the western edge of the project area. These piles varied in size, but contained felled trees and assorted vegetation rubbish. It was not possible to view the ground surface beneath these piles even when climbed over. Adjacent to the clearing piles was a man-made bog. This area was circumambulated and spot-checked for remaining archaeology. Another area of inaccessibility was the fishpond drainage. The existing runoff has been cut off from draining into the ocean, resulting in an abundance of dense vegetation and deadfall along the coast.

In addition to the surface features recorded, the ground was examined for any cultural indicators, including soil depressions (possible *imu*), midden scatters, or exposed artifacts. Flagging tape was used to mark ends of transect lines and features. Upon completion of the survey, identified sites were mapped and described.

2. Hand Excavations Including Coring Samples from the Six-Acre Fishpond

Excluding the coring samples taken from the fish pond, a total of nine hand excavated test excavations were performed within the project area. Eight of these were related to Site # 50-30-9-763 (rock platform) to determine function, age, and to search for midden or other cultural deposits. One test unit was excavated at the shoreline to test for cultural remains. See section "VI Testing Results" of this report.

Based on oral interviews, it was determined that Site # 50-30-9-762 (rock walls and terrace) which are all located in Lot 1 (Figure 5) are historic and related to the Robinson era of occupation, which spans 135 years. Thus, no test excavations were performed on the walls. The issue of testing to date the walls was discussed in advance with SHPD staff who seemed amenable to the argument that test excavations on the walls and terrace would not yield any favorable results and, therefore, would not be necessary.

Random coring samples of the 6-acre fish pond was conducted for Cultural Surveys Hawaii by Dr. David Burney of Fordham University. Seven samples were taken approximately every 40 cm. to a depth of 220 cm. where the thickest deposit was found.

3. Backhoe Testing

The backhoe subsurface testing of the project area consisted of the excavation of 23 backhoe trenches. Backhoe trenches provided a means to rapidly investigate subsurface deposits. Trenches were dug to investigate specific questions regarding expected subsurface deposits. They were also dug to give a representative coverage throughout the entire project area so that unexpected deposits would not be missed. Once a subsurface cultural layer was identified, subsequent trenches were excavated in an attempt to circumscribe and define the horizontal extent of the layer.

Trenches were excavated to sterile sediments or bedrock. Trenches were generally one bucket width (0.75 m) wide and between 1.0 and 2.5 m deep. Length varied from 5 to 12 meters. The generally loose calcareous sand sediments were prone to collapse. Excavations were sometimes limited by repeated sidewall collapse.

Excavation sections were documented with scale section profiles, photographs, sediment descriptions, and, where useful, sediment samples. Sediment descriptions included Munsell color designations, texture, compactness, structure, and lists of inclusions and cultural material present. Representative samples of cultural material were collected from sediment samples sifted through 1/8th inch mesh screens. Screened samples were either sorted in the field or brought back to the laboratory for sorting. All collected material was catalogued, see Appendix 5.

4. Oral History Interviews

Interviews for this report were not part of the actual proposed *Scope of Work*. However, interviews were conducted for a separate report, "*Hawaiian Traditional Customs and Practices Study for Kapalaawai*" (Mc Guire *et al.*, 1999 [Draft]) which was written for the proposed development under discussion. As part of this "Traditional Customs and Practices" study, interviews with knowledgeable informants were conducted regarding traditional and cultural uses of the land during the pre-contact and the historic periods. Any information regarding land use, sites and structures which might pertain to this report was diligently pursued.

The following agencies, organizations and people were asked to help identify and recommend any potentially knowledgeable individuals and/or give any information which might be useful to the proposed project area and development: the Office of Hawaiian Affairs, Kaula Community College, Kaula Historical Society, Kaula Museum, University of Hawaii at Manoa - Dept. of Indo-Pacific Languages, *kumu hula*, respected *kāpuna* in the community, Warren Robinson and Bruce Robinson. Inquiries were not limited solely to the above organizations and people but any possible leads were followed up on as well.

Seven formal in-depth interviews were conducted with a total of nine people. Except for Warren Robinson and Bruce Robinson, all of the people interviewed were prior employees of the Robinson family and they had all worked and/or lived at the Kapalaawai project area at some time during their employment. The interviews generally lasted about two hours. All formal interviews were taped and transcribed and releases were obtained from the informants. Pertinent excerpts are included throughout this report to substantiate data.

In addition to the formal interviews, there were many "informal" phone calls and "talk-story" sessions with people in the community to follow up on leads and to substantiate and confirm information which was obtained.

Currently, there are still several residents living in the "camp area" portion of the project area. Some of these residents were informally approached and asked questions regarding

the historic rock walls and terraces. There was some reluctance to "talk story" openly or be interviewed formally.

II. NATURAL SETTING

A. Makaweli Ahupua'a

The present study area is located in the *ahupua'a* of Makaweli within the Waimea District of Kauai. This large *ahupua'a* of 21,844 acres is situated between latitudes 21° 54' 30" S and 22° 04' 30" N and longitudes 159° 40' West and 159° 30' East. It is bounded on the west by Waimea *Ahupua'a* and on the east by Hanalei *Ahupua'a*. At its northern edge it includes part of the Alakai Swamp and runs along the Waimea-Hanalei District border including Mt. Wai'ale'ale and at its southern edge is the open ocean. A large part of the upper part of Makaweli *ahupua'a* lies in the Na Pali - Kona Forest Reserve.

The Island of Kauai is made up of a large shield volcano. "At the top of the shield was a caldera 15 to 20 kilometers across - the largest in the Hawaiian Islands. The southern flank of the shield collapsed to form a fault-bounded trough, the Makaweli graben, or depression, some 6.5 kilometers wide. Lavas erupted in the caldera gradually filled it, except on the higher northwestern side, and eventually spilled over its low southern rim into the graben, down which they flowed into the sea" (Macdonald *et al.*: 453). "The lavas that filled the main caldera make up the Olokele Formation and those that accumulated on the Makaweli graben are called the Makaweli Formation" (*Ibid.*: 455). A later post-erosional series of eruptions occurred 1.5 million years after the original Waimea Canyon Volcanic Series. This late eruption is called the Koloa Volcanic Series and about 40 vents were scattered widely over the eastern two-thirds of Kauai (*Ibid.*: 458-9). The lavas filled many valley floors in eastern Kauai, including valleys in Makaweli *Ahupua'a*.

The soils of Makaweli consist of Makaweli-Waiawa-Niu Association in the lower (south) portion, Rough broken land-Mahana-Koke'e Association in the middle elevation section, and Rough mountainous land-Rough broken land-Rock outcrop Association in the higher elevations (Foote *et al.*: General Soil Map for Kauai).

B. Project Area Soils

The soils of the project area in front of the main house begin at the ocean edge with beach sand and going inland are sand mixed with filled in materials. It is classified as Fill Land by the Soil Survey (Foote *et al.*: 31). On the eastern edge of the property the soils are classified as Jaucas Series, which "consists of excessively drained calcareous soils that occur as narrow strips on coastal plains adjacent to the ocean" (*Ibid.*: 48). More specifically the soils are classified on this part of the property as "Jaucas loamy fine sand, 0 to 8% slopes which occur on old beaches and on windblown sand deposits in the western and southern parts of Kauai" (*Ibid.*: 49).

C. Project Area Vegetation

The project area has a variety of vegetative habitats including open areas with little or no vegetation, grassed areas, wetland areas, and heavy *kiawe* (*Prosopis*) forest. The area in front of the main house has been cleared to the ocean for the view. On either side of the view is a thinning forest of *kiawe*. The vegetative zones are described in the *Manual of Flowering Plants of Hawaii*, Volume I, as "Coastal Dry Forest - *Kiawe* (*Prosopis*) Forest, subtype inland *kiawe* forest" which "often has an open woodland aspect. It occurs in low, warm areas, especially in dry situations near the coasts on all of the main islands, primarily below 300m in elevation. This community is usually very species-poor and consists almost exclusively of species introduced since the 19th Century" (Wagner *et al.*, 1990: 62).

Because of the wetlands caused by drainage of Kekupua Fishpond (and perhaps ground water seepage) there is also a Coastal Wet Community zone in the project area. "Native examples of these communities were much disturbed by the ancient Hawaiians because nutrient-rich flood plains, marshes, and lowland riparian areas were largely converted into fishponds or irrigated farmlands for cultivation of *kalo* (*Colocasia esculenta*)" (*Ibid.*: 64). This particular area is referred to as Coastal Wet Shrublands-Marsh Fleabane (*Pluchea* spp.). Shrubland *Pluchea* was recorded near the "man-made bog".

Coconut trees (*Cocos nucifera*) are scattered throughout the property. They are most noticeable around the perimeter of Kekupua Fishpond, and on the dividing wall. There are also monkeypod trees (*Samanea saman*) around the main house and opiuma trees (*Pithecellobium dulce*). Colorful bougainvillea vines (*Bougainvillea spectabilis*) are planted on walls and are found in clusters throughout the project area.

III. PRE-CONTACT AND HISTORICAL BACKGROUND

A. Pre-contact

To the west of Makaweli is the *ahupua'a* of Waimea, which is the largest *ahupua'a* on the island of Kaua'i. Early accounts within this *ahupua'a* indicate a coastal settlement pattern. Cultural layers and burials have been recorded along the shore around the project area. This is a typical pattern throughout the Hawaiian Islands. In addition to coastal settlement, the fertile Waimea River Valley has the resources to support a substantial population. As such, it too has early agricultural settlements. Hammatt and Ida (1993) identified a prehistoric cultural layer (State Site # 50-30-05-4012) in present-day Waimea Town. The layer was charcoal carbon dated to A.D. 910-1275. There has not been as much development within the *ahupua'a* of Makaweli. Therefore, previous archaeology does not reveal the settlement pattern as clearly. Interpretations of pre-contact land use within Makaweli can be extrapolated from Waimea. Coastal occupation and river valley settlement patterns would have mirrored those in Waimea only on a smaller scale.

Clearly Kaua'i in general and the Kona District in particular was largely isolated from the political intrigues and strife that marked much of late pre-contact Hawaii. Studies of Kaua'i's political history (Hommon 1976 and Formander 1969) indicate that 18 out of 24 transfers of political rule were cases of orderly succession. Prior to Cook's arrival, there may have been only two military conflicts in the history of Kaua'i: a raid by a Big Island chief, circa 1460, and a dynastic struggle between the cousins Kawelo aikanaka and Kawelo-a-Maithunali'i (who was aided by O'ahu forces), circa 1680. Life at Kupalawai was peaceful.

To some extent, Cook's arrival coincided with an increase in Hawaiian political and military aggression. In 1779 there were the "Goat Wars" with Ni'ihau. In 1791, Kaua'i forces were involved in fighting at O'ahu (death of the Kaua'i chief Ka'eo'ekilani) and in the "Red-Mouth Gun" fighting against Kamehameha I at Hämākua, Hawaii. In 1796, Keawe, the son of Kamakahaie and Kiha, led a revolt against Kaumuali'i from which Keawe emerged *ai'i nui* (Kuykendall 1968:48, f. n. 51a). From 1796 to 1804 a state of war existed with Kamehameha I which was rekindled in the Kaua'i rebellion of 1824.

From Captain Cook's landing, western impact exacerbated native political tensions. Cook's own lieutenants (Fortlock, Dixon, Vancouver) returned to Waimea repeatedly and established it as a major port and entrepot. While Waimea may have always been a royal center for the *ai'i* of Kaua'i, this position was greatly reinforced after western contact.

B. Kaua'i at Contact

Written accounts of Hawaii began when Captain James Cook anchored a mile off shore at Waimea Bay on the southwest side of Kaua'i on January 20, 1778. The squadron consisted of two ships, the *Resolution* and the *Discovery*. Cook went ashore to investigate the availability of water and the temperament of the people to see if they were friendly and if a trade for supplies could be negotiated.

The very instant I leaped ashore, they all fell flat on their faces, and remained in that humble posture till I made signs to them to rise. They then brought a great many small pigs and gave us without regarding whether they got anything in return or no indeed the most of them were presented) to me with plantain trees, in a ceremonious way as is usual on such like occasions, and I ratified these marks of friendship by presenting them with such things as I had with me. (Beaglehole, 1967: 269)

The Hawaiians afforded Captain Cook the same respect they would have given one of their high chiefs. It is believed by many that they took him to be the personification of one of their gods, Lono (Kuykendall, 1938:16).

The previous day, a "large pond" had been seen beyond the shore and, on the second day, a watering party was sent to replenish the ships' supplies. Cook reports:

We no sooner landed, that a trade was set on foot for hogs and potatoes, which the people gave us in exchange for nails and pieces of iron formed into some thing like chisels. We met with no obstruction in watering on the contrary the Natives assisted our people to roll the Casks to and from the pond.

Captain Cook took a short walking tour of the immediate area and comments:

...[I] took a walk up the Valley, accompanied by Dr. Anderson and Mr. Webber; chiefly of Tara (Taro), and sunk a little below the common level so as to contain the water necessary to nourish the roots. As we ranged down the coast from the East in the Ships, we observed at every Village one or more elevated objects, like Pyramids and we had seen one in this valley that we were desirous of going to see. Our guide understood us, but as this was on the other side of the river, he conducted us to one on the same side we were upon; it proved to be in a Morai which in many respects was like those of Otaheite.

This "Morai" on the west side of the river, is thought to be Keaalii *heiau*. The *heiau* "on the other side of the river" was probably Mahaihai *heiau*, whose location is noted on a map by Francis Gay (Bennett, 1931: 104, 111). Waimea Village during this time has been estimated to have consisted of about sixty houses close to shore and about forty more houses behind the main settlement (Ronck, 1985: 29). Cook goes on to say:

... We returned to the beach by a different rout to the one we came. Besides the Tara (Taro) plantations before mentioned we met with some plantations of plantain, Sugar cane and the Chinese paper Mulberry tree or cloth plant, as it is more generally called by us, there were also a few low coconut trees but we saw but one bread fruit and but very few of any other sort. (Beaglehole, 1967)

While provisioning on this particular excursion, Cook's party acquired nine tons of water, 60 to 80 pigs, some fowl, potatoes, a small quantity of plantains and taro — all this in exchange for nails and iron pieces (*ibid.*). Captain Cook's first visit to Waimea was brief, but it left a major impact on the small village.

C. Population

The population of the Hawaiian Islands at contact has been generally estimated to be between 200,000 to 400,000 but some estimates range as high as 800,000 to 1,000,000 (Stannard, 1989). Fifteen years after Captain Cook's arrival, Captain George Vancouver makes a comment that reflects the loss of life attributed to Western disease:

...a decrease in the population of the country and in the number of chiefs since the time of the arrival of Cook, who reported the land covered with people and the chiefs numerous (Kamakau, 1992: 162-63).

The missionaries are responsible for taking the first census in 1831. The total count for Kaua'i in 1831 was given as 10,977. Many Hawaiians died as a result of foreign diseases. Twenty-two years later, in 1853, the count for Kaua'i had dropped to 6,991 - a decrease of 36 % (Schmitt, 1977: 3,11,12).

D. The Russian Arrival

After Cook's death at Kealahou on February 14, 1779, Charles Clerke took charge and headed for Waimea once again. After provisioning at Waimea and Ni'ihau, he sailed for Kamohakua, and finally anchored at Petropavlovsk. Clerke was dying of tuberculosis and, anticipating that he might never reach England, he entrusted Captain Cook's journal, maps and reports with the Russian governor, Major Behm, who was returning to St. Petersburg. Behm was to pass the documents on to the British ambassador who would in turn hand them over to the proper authorities in London. These events led to the Russians being the first to learn about Cook's discovery of the Hawaiian Islands before the rest of Europe and the world (Joesting, 1984: 41). This set the stage for Russian involvement in the Hawaiian Islands.

The Russians recognized the importance of Hawai'i for provisioning their ships along the fur trade route between the Northwest and China. In 1815, a Russian-owned ship full of furs hit a reef and sank off Waimea Bay, Kaua'i. The crew abandoned ship and was left stranded on Kaua'i for 2-½ months. Meanwhile, Kaumuali'i, paramount chief of Kaua'i, retrieved the ship's goods (furs included) and kept them, in spite of the Russians' objections. Georg Schäffer was sent to Hawai'i under Russian orders to retrieve the goods as diplomatically as possible. It has been debated whether Schäffer was following orders or whether he acted on his own behalf when he raised the Russian flag on Kaua'i. An agreement was reached when Kaumuali'i asked for protection in exchange for a Russian monopoly of the sandalwood trade. Kaumuali'i agreed to provide 500 men as an army to conquer the other islands and Schäffer was to provide the ships, ammunition, and

weapons. An important part of the agreement was that Schäffer would oversee all construction of future forts and trading posts. The Russian fort at Waimea was built by the Russian-American Company in 1816 under the direction of Schäffer. Kamehameha I, hearing of Schäffer's plans and feeling intimidated by the threat of Russian invasion, sent a message to Kaumuali'i asking that Schäffer be deported. By June of 1817, Schäffer and his men were forced to leave Kaua'i (Mills, 1996: 30-37).

E. The Kaua'i Rebellion of 1824

In 1824, Kaumuali'i got very ill. Gathered around him were his sisters, his wife, Ka'ahumanu; his daughter, Kapeo; and the prime minister of the Kingdom, Kalanimōkū. When Kalanimōkū asked him how the lands were to be redistributed after his death, Kaumuali'i answered:

"Let the lands be as they are; those chiefs who have lands to hold them, those who have not to have none." (Kamakau, 1992: 265)

Kalanimōkū decided to disregard Kaumuali'i's wish that the land not be redistributed. All Kaua'i lands were seized. Some of the Kaua'i chiefs, unsatisfied with the lands they currently held, rebelled and stormed the Russian Fort, where Kahala'i had been left in charge. News of the rebellion reached Honolulu and companies of soldiers were sent to Kaua'i as backup. In the end, the rebel chiefs were defeated and Kalanimōkū agreed to redistribute the lands. It was at this time that Kaua'i and the rest of the islands were turned over to the child king, Kamehameha III (Liholiho Kamehameha II's younger brother), and Kaikio'ewa was appointed the new governor (*ibid.*: 265-269). Kaikio'ewa was an old warrior chief who was the guardian (*kahu*) of Kauikouali'i.

... Sometime before Kahala'i left the fort, the 'i'i of Kahō'omano in the *ahupua'a* of Makaweli was given by Ka'ahumanu to Kahala'i for the use of soldiers stationed at the fort. This land belonged with the fort since the days of Kaumuali'i and continued to be used by soldiers, or "koo" into the early 1850s. (Mills, 1996: 198-199)

F. The Mahele

At the *Mahele* of 1848, Victoria Kamāmalu, younger sister of Kamehameha IV and V, was awarded LCA 7713. The award consisted of 50 *āpana* or parcels, most of which were whole *ahupua'a*. Included in the award was the *ahupua'a* of Makaweli. Because she was only 7 years old at the time of the *Māhele*, her guardians, Mataio Kekuanā'oa and Ioane 'I'i, acted on her behalf. In 1857, Kekuanā'oa and 'I'i, acting as guardians of Victoria Kamāmalu, agreed to *Palapala Ho'ōlimalama Kula* (lease for *kūla* lands) to a *hui* (group) of people from Makaweli and Waimea. The group consisted of 120 people who all signed the lease. The lease reads:

Eia nā mea i koe ma kāa ho'ōlimalama 'ana o ka loko nui i Kōkupu a me nā loko i'i 'i'i, 'o ka 'a ho'ōmalu, 'o ka lāu kapu o nā kumu 'alani i Waikae, 'o nā lo'i Pō'olima a me nā kumu nui o Mahaihai a me Kēkupu, 'o nā kuleana'o nā kōkō a me ka Pō'ū kapu, ka wahie inā he mea kū ai koe no ia ma kāa ho'ōlimalama 'ana.

Translation: Here are the things exempt from this lease. The large pond in Kekupua and the small ponds, the protected (by taboo) fish, the sanctioned wood of the orange trees at Waikae, the Pō'alima taro fields and the large trees of Mahaihai and Kekupua, the *kuleana* of the people and the reserved fort, the firewood, if it is for sale, is exempted by this lease.

The "large pond in Kekupua" is the fishpond recorded in the current project area.

The above exemptions are obviously a carry over of the ancient *kapu* system. The lease indicates the kinds of items that were *kapu*. Traditionally, large ponds were often reserved for the *ali'i*. The lease also indicates that even though the *kapu* system was done away with in 1819, certain provisions were still being observed by the *ali'i* and their people as late as 1857.

At the time of the Māhele in 1848, Waimea Town was the largest settlement on the island. There were 196 land claims registered for Waimea while to the east of Makaweli, in the *ahupua'a* of Hanapēpē, 93 land claims were registered. In Makaweli, there were 117 land claims. So as the distance increases from Waimea toward Kōloa the population and number of claims diminish. However, there is a sizable population in Makaweli of soldiers at the fort in Waimea.

1. Settlement Pattern for Makaweli Ahupua'a based on the Māhele Claims

The pattern of settlement for Makaweli Ahupua'a is far from clear. Māhele land claims of the mid 1800's often offer a good approximation of traditional patterns of land use but this is not the case at Makaweli owing to the nature of Māhele records for this area and changes in land tenure patterns which occurred in the early 1800's.

The enumeration of Māhele land claims for Makaweli is unusually complicated. In this portion of Kaula'i, many people claimed lands in more than one *ahupua'a*. There are 117 claims made by 85 claimants which either describe or award claims in Makaweli Ahupua'a. Of these 117 claims, 83 are awarded but some of the awarded parts are located in Waimea or even Hanapēpē.

It should also be noted that there is more than one Kapalawai on the island of Kaula'i. There is a Kapalawai in Waimea and also one in Hanapēpē, which are clearly different lands than the Kapalawai of Makaweli which comprises the proposed project area. Of the 117 claims made for Makaweli, nine claims were for Kapalawai in Waimea and four claims were for Kapalawai in Hanapēpē. There were no *kuleana* claims made within the proposed project area of Kapalawai, Makaweli. There is an *ali'i* claim specifically for the fishpond within the project area but it is not awarded.

The Māhele land documents suggest a pattern of the extensive exploitation of the Waimea-Makaweli-Mokuone river basin. The *ahupua'a* of Makaweli is bounded by the Waimea River on the western side at the shore. The Waimea River is fed by the Makaweli River tributary a short distance up the river, and the Makaweli River, in turn, is fed by other

streams such as the Mokuone Stream. These are the stream valleys where, at the time of the Māhele, people were settled. Waimea, at this same time, had the greatest population on the island of Kaula'i and Makaweli's land use is closely linked to Waimea, with some claimant's living in one place and farming in the other or vice versa. There is a slight preference for a house lot in Waimea, but several have house lots in both *ahupua'a*. Visiting ships were probably supplied with food from both districts when they stopped at Waimea Bay.

The fort, at the mouth of the Waimea River on the Makaweli side of the river, had seen action in the rebellion of 1824, when O'ahu forces put down the uprising against the Kamehameha dynasty. The *koa* or soldiers at the fort were given *lo'i* lands nearby the fort so they could help raise their own food. Twenty-two of the Makaweli claims are for fort soldiers, who generally claim a single *lo'i* or *mo'o*. Most fort soldiers were given land in the *'i'i* of Kaho'omano, with some others in Hakioa both located quite close to the fort.

There are 119 (*'āpana* or pieces) in Makaweli awarded claims. Awarded *'āpana* can be seen on the tax maps for the *'i'i* of Hakioa, Kaho'omano, Kakalae, Kaloulu, Kapalawai, Koleakalo Manawai, Pu'ulima, Wai'awa'awa and Waikaha all located along the Waimea River, the Makaweli River or a major western tributary of the Makaweli River (Figure 6).

A major problem in reconstructing Māhele era settlement patterns is that tax maps and other readily available historic maps do not show *'i'i* areas for claims or awards in Huakale, Kahala, Kahana, Kahola, Kaikolu, Kalā'au'ōkala, Kamaka'elī'elī, Kamo'ouli (Kamo'oali'i), Kaneli, Kaohuihau, Kapuemanu, Kaunuloa, Kiele, Kohiana, Kukuthoehoe, Kula amokuaiuli, Kumuiki, Mahaihai (Mahaemae), Manini, Mokuone, Nonopahu, Olokalau, Olokele, Palaton, Pihamo'o, Poleiwale, Uhiiau, Waikui or Waitele. It is difficult to understand the entire *ahupua'a* settlement pattern when so many of the geographic areas of settlement are unknown. Perhaps these *'i'i* were all along the western-most margin of Makaweli as is the case with the geographically identifiable *'i'i* but for all we know they may have been widely spread out over Makaweli Ahupua'a.

There frequently, however, is some location data for these "lost" *'i'i*. Ka Lā'au'ōkala is a canoe landing, and we presume it is at the shore or on the Waimea-Makaweli drainage. Kahana is described in the claims as being at the *mutu'ai* or mouth of the river. The Mahaihai Ditch is shown on maps running alongside the Makaweli River at the junction of the Makaweli River with the Waimea River and we presume the Mahaihai claims would be along that ditch. Olokele *'i'i* may have been the entire Olokele Valley. The Nonopahu claim is in the same areas as those for Koleakalo, up the river.

Of these 117 claims with 119 *'āpana*, there are 223 *lo'i* or *mo'o* (which presumably included *lo'i*) enumerated. The majority of these *lo'i* *'āpana* are in Hakioa (28), Kaho'omano (26), and Kakalae (23). Thus the vast majority of *lo'i* claims were in seaward portions of the Waimea and Makaweli Rivers. There are claims for 31 house lots, and presumably, some or all of the 22 soldiers were still garrisoned at the fort. The house lots tend to be in *'i'i* closer to the shore, and some along the rivers. There are 19 claims for *kūia* and these are pastures or gardens scattered in among the *lo'i*. Gardens are very

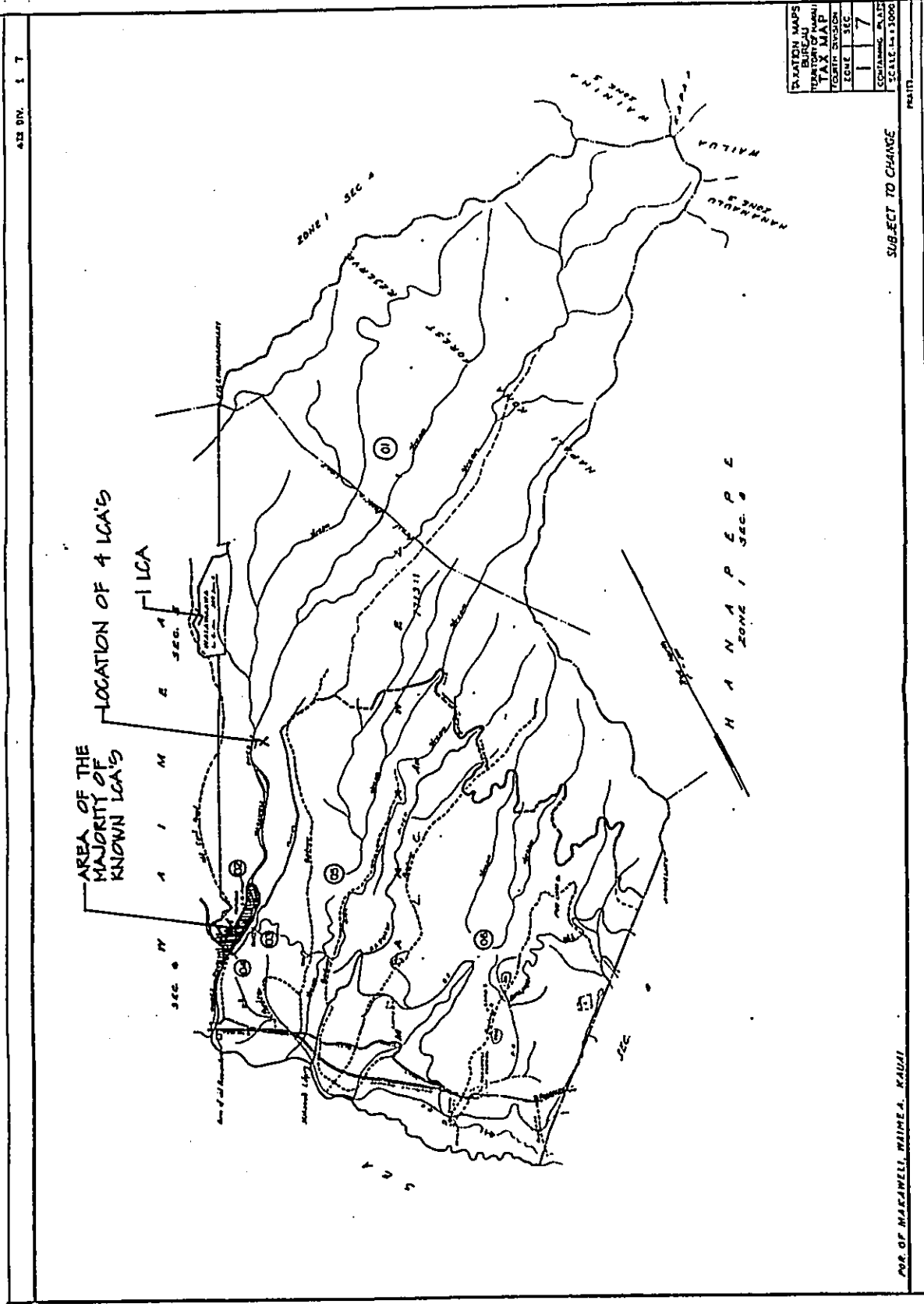


Figure 6 Map of Makaweli Ahupua'a (TMK 1-7) showing areas of known mid-1800s settlement

much a part of the Makaweli landscape and appear in the claims in several different guises. There are twelve claims for *kāhāpai*, for a *kūla* garden, three others for gardens in house lots, three for a *pūkanu* (cultivated garden), and one for a *lāro kāhāpai*. Many claims mention the various *auwai* or ditches, and the ditches carry the name of the nearby *'i'i* or the *'i'i* is named for the *auwai*. Three claimants claim four *auwai*. There is also a claim for a pig pen in Kaikolu and a goby fish enclosure in Manawai.

A potato planting claim is made by a soldier in an unknown location, but presumably near the fort. Many of the *kūla* may also have contained plantings for sweet potatoes. There is a claim in Kakalae for coconut and fig trees (236F) and a coconut grove (4291B) in Mahaihai. Both mentions of coconut groves occur as markers for boundaries.

There are no *Māhele* claims for *uauke*, *olonā*, bananas, *hala*, orange or lemon trees as there are in most of the Kāua'i *ahupua'a*. Although these cultigens may have existed, they have not been mentioned. This lack of diverse cultigens may also be the result of this Makaweli River area being so closely linked with Waimea, almost as a suburb. This Makaweli area was a large food factory probably for both Makaweli and Waimea, and in fact, perhaps even more for Waimea. There is much more diversity in cultigens claimed in both neighboring *ahupua'a* (Waimea and Hanapēpē) suggesting that, at the time of the *Māhele*, Makaweli primarily produced food staples.

Within the Waimea-Makaweli-Mokuone valleys, area paths, *pāi* and *auwai* or neighbor's patches are the usual limit to the land claimed. A government road is mentioned several times and represents the cross-*ahupua'a* transit area. The paths go along the rivers and up through the different *'i'i* providing access between the higher lands and the shore.

Claimants of large tracts, such as the *ahupua'a* or the 298+ acres for the Mission lands provide information about highly prized fish ponds and salt ponds, but little else about the land within these large areas. Three *ai'i* have claims to the entire *ahupua'a*, Ahukai wahine, Emelia Keaweamahi, widow of Kaikibewa, and M. Kekianaō'a for Victoria Kamāmalu. Victoria receives the land of Makaweli as well as a small *'āpana* within Kaho'omano, the latter claim is slightly unusual, since usually all land not claimed by the *kūleana* tenants belonged to the chief/chiefs who was awarded the land. Both Ahukai and Keaweamahi speak about the fish pond, Kahe (also known as Kekupua Fishpond), in Kapalawai and the reader is referred to other sections of this report for that discussion.

Fishing is mentioned in the Mission claim #387, which can be seen on Tax Map Key 1-7, (Figure 6) some distance up a Makaweli River tributary. Kaumuali'i, former reigning chief of Kāua'i, gave Mr. Whitney the land of Kakalae near the juncture of the Waimea and Makaweli Rivers and the food fish *auhau* ["tax"] and all other appurtenances, with which he took possession of in the *'i'i* of Kakalae and held it in peace under Kaumuali'i and all his successors until his death.

From our knowledge of Waimea and Hanapēpē, it is probably likely that the land just mauka of the shore provided *pili* grass for housing and that there were possibly even wetland terraces in other valleys to the west of the Makaweli River, but we have no

records. The *ai'i* used the Kekupua Fishpond and the Kapalawai area. There were a few salt ponds along the shore. The *Māhele* records leave us in ignorance about the eastern and central part of the *ahupua'a*, but provide us with a very detailed record of the western end of Makaweli, which was extensively cultivated along the Waimea-Makaweli-Mokuone river valleys.

The *Māhele* land use pattern at Makaweli was very strongly focused along the seaward portion of the Waimea-Makaweli-Mokuone river valleys. In the general absence of historic or archaeological accounts about the eastern and central part of the *ahupua'a* we are left only with conjecture. It seems likely that the creation of a Waimea mission station, a major trade center and a fortification at Waimea drew people in from the surrounding country. It seems probable that habitation and agriculture were more spread out throughout Makaweli *ahupua'a* in pre-contact times. It does appear likely, however, that the westernmost margin of Makaweli was always the most populous portion of the *ahupua'a* owing to the well-watered flatlands of the Waimea-Makaweli-Mokuone river valleys. Thus, to the extent that the historic record truly reflects settlement patterns, we can only assume that there was remarkably little Hawaiian activity at Kapalawai other than use of the fishpond.

G. Ranching on Kāua'i

In 1793, Captain Vancouver gave Kamehameha a gift of a longhorn bull and a heifer, which were pastured on the island of Hawai'i. A ten-year sanction was put on the cattle to ensure their survival and growth. These strange looking animals were called *pua'a bipi* (pig-beef) because of their strange stare. Kamakau notes that "this was the beginning of the wild herds of Waimea and Mauna Kea" (*Ibid.*: 164). By the 1820s, the unchecked cattle population had used up their grazing lands and were attacking the farmlands. In 1832, Kamehameha III recruited Spanish vaqueros to teach Hawaiians how to ride horses and rope cattle (Ronck, 1985: 57).

In 1803, Richard Cleveland brought the first horses to Kāua'i. Kamehameha did not see much use in them since they were not used for food like cattle were (*Ibid.*).

In 1831, ranching was introduced to Kāua'i when Richard Charlton, the British consul, leased some land in the Hanalei district. He started with a herd of about 100 head of cattle. Other ranchers followed suit and in 1848 the practice of registering brands to distinguish ownership of cattle was started on Kāua'i. Kaumuali'i's favorite wife, Deborah Kapule, kept a large herd along the Wailua River (*Ibid.*).

It's apparent, according to articles in Hawaiian language newspapers of the time, that "wild cattle" were still a problem on all the islands even in the late 1800's. In 1874, G. K. Maka from Waiolama, Hilo writes a letter asking support for a bill of complaint to the Legislature:

In these days in which we are living here, we are surrounded by cattle and live together ...Therefore, you people who are so fond of your lands that you hold them

back, do not lease them. We are living in trouble. O my fellow representatives, from Hawai'i to Kaula'i... Perhaps now our king will agree, just as he promised to here in Hilo, to let you fence in your patches and homes and if cattle enter take the (creature) to the Pound. Here is a good idea, let the lease holder put up the fences... (Nāpepa Kūōka; June 13, 1874).

By 1899, "wild cattle" as well as goats had become a big problem on Kaula'i. Notes from Henry Pratt Judd of a hunting trip to Makaweli indicate that over a 2-day period a total of 180 goats and 11 cattle were shot (Judd manuscript, Kaula'i Historical Society).

H. Sugar

In 1835, Ladd and Company started the first successful sugar plantation in Hawai'i at Kōloa, Kaula'i. William Ladd, William Hooper and Peter Brinsmade took out a fifty-year lease on 980 acres of land at Kōloa from Kamehameha III. As other sugar plantations were organized, more labor was needed to work the fields. Plantation owners began recruiting laborers from outside the Hawaiian islands. The Chinese were the first to arrive in 1852, followed by the Japanese in 1868 and Portuguese workers in 1878.

The Hawaiian Sugar Company was founded at Makaweli, *Ahupua'a* shortly after the signing of the Reciprocity treaty of 1876 by representatives of the Scottish Mirreces, Watson & Yaryan Company. Samuel T. Alexander and Henry P. Baldwin took over the plantation, incorporating it in 1889 (Conde and Best 1973:134). A large mill was established at present day Kaunakani Town and approximately a dozen camps for sugar workers were scattered amongst the fields.

I. Rice

The influx of Asian immigrants brought new changes and new demands. At Hanalei, rice farming was introduced by the Chinese in the late 1800s, in part, to support the demand of the large immigrant population. On Kaula'i, the Chinese seemed to take over as much land as possible. Coulter, quoting Damon, writes that:

In Hanalei valley, with the exception of a small portion devoted to sugar, the bottom lands were "turned into one waving field of rice." Some Chinese "had crept far up into the recesses of the side valleys." ...On the opposite side of the island Chinese had found their way up to the head of the winding valley of Waimea. (Coulter 1937: 20)

By 1892, 2,055 acres of Kaula'i land were planted in rice (*ibid.*: 21).

J. The Sinclair-Robinson-Gay Legacy

The matriarch and pillar of the Sinclair family was Elizabeth (Eliza) McHutchison Sinclair, born April 26, 1800 in Glasgow, Scotland. Eliza, as she was called, hailed from an influential Scottish family. At the age of 18 she accompanied her father on a business trip

where she had the good fortune to meet Francis Sinclair, a captain in the Royal Navy. About one year later, in 1819, they were married (Appendix 2). Captain Sinclair resigned from his post in the Navy and took a position at the Inland Revenue Office in Edinburgh, the city of his birth. Here at Edinburgh, all six of their children were all born.

Eliza was ambitious and wanted to provide a firm inheritance for her children. It just so happened that the Royal Navy was offering generous portions of land to retired officers in the newly developing colony of New Zealand. Eliza must have been a very self-reliant and progressive woman for her time to embark on such an adventure at her age (39 years) and with six children, no less — the youngest being seven months old. So in October of 1839, the family bade farewell to their native Scotland bound for adventure and a new life in New Zealand.

Upon arriving in New Zealand in 1841, the family learned they were unable to settle on their lands due to disputes with the native Maori, so they settled temporarily in Wellington instead. During this time, Captain Sinclair built a ship from hand-hewn logs and traveled up and down the coast trading along the way. In 1843, the family settled in Pigeon Bay at Craigforth, the home Captain Sinclair and his sons had built. The family was very resourceful and were pioneers in the truest sense of the word. They raised cattle and sheep and the "men" of the family became adept at boat building.

In 1846, a tragedy occurred. Captain Sinclair, along with his oldest son, George, and daughter Jane's fiancé, Alfred Wallace, sailed to Wellington for supplies. With him, he had taken the family earnings and the year's harvest. The ship and its passengers were lost at sea and were never recovered. Eliza Sinclair was left on her own with little money to support her remaining five children in a rugged and far-off land.

Eliza Sinclair must have been a resourceful and strong woman to survive this tragedy in her life. She had a level head on her shoulders and in time was able to turn things around and prosper again. In 1848, daughter Jean married Captain Thomas Gay, a whaling captain. In 1850, another daughter, Helen, married Charles B. Robinson, a prominent gentleman who lived fifteen miles away in Akaroa. Two years later, Helen left her husband Charles Robinson never to return again. She and son, Aubrey, returned to Craigforth to live with the rest of the family.

Seeking excitement and new adventure, the family decided to set sail for British Columbia or California in search of new land and a change in lifestyle. It was convenient that Jean's husband, Thomas Gay could sail a ship. Along with the family's personal possessions, the 'Bessie' was well-supplied with food, livestock, and everything needed to start up a new home again on a new frontier. In April of 1863, the Sinclair-Robinson-Gay families said good-bye to their New Zealand home for good. Eliza Sinclair was 63 years old at the time. It is not clear whether the 'Bessie' stopped in Honolulu enroute to Victoria on Vancouver Island. At any rate, British Columbia did not suit the families' plans, so upon a suggestion from a family acquaintance, they set sail for the Pacific and Hawai'i.

The 'Bessie' arrived in Honolulu on September 17, 1863. The Sinclair's immediately began looking for large tracts of land to purchase. Disappointed with what they saw, the family decided to head for California in search of better prospects. King Kamehameha IV, hearing of their plans to leave, offered them the island of Ni'ihau. Unusually heavy rainfall was recorded for 1861-63 and Ni'ihau was exceptionally lush and green when the two Sinclair brothers, Francis and James, did a site inspection of the island. Excited at their discovery, they hoped to re-establish the cattle and sheep business they had left behind in New Zealand. The two brothers accepted the King's offer and purchased the island of Ni'ihau for \$10,000 in gold.

Supposedly, the King was happy to sell Ni'ihau because it had become a financial burden for him. In the middle of the business negotiations, Kamehameha IV died and Lot Kamehameha V became the next king. This explains why Kamehameha V's name (rather than Kamehameha IV) is on the land documents.

In 1865, Eliza Sinclair purchased the *ahupua'a* of Makaweli (21,844 ac.) from Victoria Kamāmalu Ka'ahumanu for \$15,000. A new home was built in the cool uplands of Makaweli and sometime in the early 1870's the Sinclair family moved from Ni'ihau to settle there. This home, situated at about 1800 ft. elevation became known as the 'Makaweli house' that is mentioned in so many of the early journals of visitors to Kaua'i.

The Kapalawai house was built by Aubrey Robinson for his wife Alice Gay Robinson. The exact date of construction is not known, but the house was probably built around the mid-1890's. The original house plans do not show a date, but the Robinsons have a photo of the house with the date 1897 written on the back (Ed Rice 5/19/99; pers. comm.), thus making the house at least 103 years old. The Kapalawai house was recorded with the State Historic Preservation Division in April of 1999 and was assigned State Site Number 50-30-9-764/A.

Speaking of the family's use of Kapalawai, Bruce Robinson says:

Well, for the family, this was truly a family farm... this is not to be included as the ranch... the ranch got started up in the mountains ...they had milk cows, they had lots of horses... We had fruits and vegetables... flowers... pigs, goats... and a fish pond, plus the ocean where they could catch fish... (Interview 5/21/99).

Warren Robinson's memories of Kapalawai include:

So the children would come every Sunday for dinner. And after dinner, we'd usually sing hymns and my grandmother would read from the prayer book... I was more connected with getting into mischief as a kid than anything else. You know, running all over, playing tag. Can you imagine growing up in that house? ...it was a super place to play in as a kid (*Ibid.*).

The Sinclairs began ranching in Hawai'i when they bought the island of Ni'ihau in 1865. There they raised Merino sheep and Shorthorn cattle from the continental United States, Australia, and New Zealand. Aubrey Robinson was the first to bring purebred Arabian horses to Hawai'i in 1884, and he maintained stables at Kapalawai. He imported game birds (pheasant and quail) as well as trout and bass which were placed in Waimea and Makaweli streams.

In 1889, Francis Gay and Aubrey Robinson formed the family partnership known today as Gay and Robinson (G&R). Through this partnership, the various family businesses, i.e., Makaweli Ranch and Makaweli Plantation were managed. By the early 1890's the Robinsons got involved in the sugar business not only by planting their own crops, but also by leasing large tracts of land to Hawaiian Sugar Company. The Robinsons were always looking for new and creative ways to utilize their land. For many years, they raised bees for honey and experimented with other agricultural crops.

The Robinson Family Partners is a separate business entity which represents the land owners of the family lands. This partnership was set up to protect the lands and ensure that all lands stay within the family, as well as to preserve these lands for future generations of Robinsons. Today, Warren Robinson, son of Selwyn Robinson, and grandson of Aubrey Robinson, is the family patriarch and President of the Board.

In speaking of the Robinson legacy, Ed Rice, retired CEO for the Robinsons, talks about the Robinson work ethic and their attitude toward the land,

...it was a love of the work and the land that drives these guys. It's what drives that young man who just drove away (Alan Robinson), and his father, and his father's father! In a bigger sense, and this has to do with what the Robinson empire means to the family, it was a way to husband the land. You didn't walk away and leave it with no usefulness... even if it cost you money, you put it to some kind of constructive use. That's what ranching is. (Interview 5/18/99)

The Sinclair-Robinson-Gay family heritage is rich in history. Their pioneering spirit is still evident in their determination to preserve the past and the legacy that Eliza Sinclair started.

K. 1900's to Present

Rice farming declined sharply throughout the Hawaiian Islands after the first decade of the 20th century. Total acreage dropped from a high of 9,425 acres in 1909 to 1,130 acres in 1935. By the 1930s the rice industry had ceased entirely on the islands of Hawai'i, Maui and Moloka'i (Coulter and Chun, 1937:62). Though rice continued to be grown at Waimea into the 1930s, many of the rice fields were being reclaimed for sugar planting. Population figures up to World War II reflect the continued growth of the Waimea District as the sugar industry prospered. In 1910 the population total was 8,195 and by 1940 it had grown to 10,852 (Schmitt, 1977: 13-14).

By the early 1930s, about 670 acres of land was cultivated by the Waimea Sugar Mill Company. Most of Waimea Town's commercial buildings were constructed during this period of the sugar industry's growth.

Following World War II, the fortunes of the Waimea Company changed. The Waimea mill stopped operating in 1945, though the Waimea Sugar Company continued to cultivate cane on its lands until 1969. After the company closed, its fields were leased to the Kekaha Sugar Company.

During recent decades, growth in Waimea has focused on development of the former sugar plantation lands and structures into tourist-oriented facilities. Nearby, on the current project area, land use has remained much the same since the turn of the century. Cattle ranching continues. Surrounding lands are used either as cattle pasture or are under corn or sugarcane cultivation.

1. Settlement Pattern for Makaweli Ahupua'a in the late Nineteenth and Early Twentieth Centuries

As discussed previously, the settlement pattern in the mid-nineteenth century, as far as we can reconstruct it from *Māhele* land documents, was remarkably focused on the westernmost margin of Makaweli along the well-watered flatlands of the Waimea-Makaweli-Mokuone river valleys. The Robinson's residences in the uplands (the "Makaweli house" was built circa 1870) and along the coast (the "Kapalawai house" was built circa 1890) were two small population foci but the major habitation areas of the last hundred years were the result of the development of the sugar industry.

The Hawaiian Sugar Company established eleven or twelve small "camps" scattered among their fields in Makaweli Ahupua'a around the turn of the century (including camps numbered 1-10, Makaweli Camp and Pakara Camp. The town of Kaumakani grew up from the settlements around the sugar mill known as "Makaweli Camp" and "Camp 1". Pakala Village grew up from "Pakara Camp". Kaawanui Village grew up from "Camp 6". All trace of most of the other camps has disappeared from modern maps.

During the late nineteenth and twentieth centuries the Robinson residences were islands in a sea of commercial agriculture, isolated from the flux in settlement patterns and modernity in general.

IV. PREVIOUS ARCHAEOLOGICAL RESEARCH

A. Bennett

An early archaeological site survey of Kaula was performed by Wendell Bennett. His findings were published in *The Archaeology of Kaula* in 1931. Bennett credits the earlier work performed by Thomas Thrum, who identified heiau sites throughout the Hawaiian Islands; much of Bennett's efforts were focused on relocating the sites noted by Thrum. While Bennett did locate several sites in the vicinity of the current project area it should be pointed out that most of these sites were further inland. The sites identified by Bennett performed a variety of functions.

1. Heiau

Bennett discusses the source of stones for use in heiau construction. In this passage reference is made to Makaweli:

There is considerable mythological and some traditional evidence that the stones for building heiaus were carried great distances. Rice (46, p. 35.) records the legends that the heiaus of Elekunn, Poihale, Kapa-ula, Maline and Poihahu were all built by the Menehunes with stones brought from Makaweli. The archaeological evidence, however, does not substantiate these beliefs. Although some of the stones of a famous temple might have been taken to be built into a new temple, a practice recorded for other parts of Polynesia, especially Tahiti, most of the heiaus were constructed from the stones in their immediate vicinity. In fact no heiau examined was constructed of stones foreign to its locality. (Bennett, 1931:40)

In another passage a reference to Makaweli as a place of refuge is established.

The following sites, all associated with heiaus, are described as "places of refuge" (*puhonoa*): (1) Hikinaakala in Waimea (p. 152), regarding which Thrum (53, p. 39) says, "Some report it as a place of refuge, while others assert that the crossing of the river to Makaweli was the only *pu'uhonoa* of this section of ancient Kaula." (It is interesting to note that a *pu'uhonoa* could possibly be a river crossing.) (*Ibid.*: 49)

The four sites Bennett identified closest to the project area are listed below:

Site 43. Mahaihai heiau, now completely destroyed. The location was taken from an old map made by Frances Gay. (*Ibid.*: 111)

Site 44. Ankukui heiau, located in Makaweli at east branch of Kekupua valley near junction. Described by Thrum as, "A paved and walled heiau in good preservation." (*Ibid.*)

Site 45. Kaunumelemele heiau, located in Makaweli on the ridge near junction of Hikilei and Kunahele valleys. Described by Thrum as, "An open platform heiau in good condition." (*Ibid.*)

Site 48. Kuwiliwili heiau. Said to have been located just below Makaweli Camp 3, which site is now in the cane fields. Thrum describes this heiau as, "A large, high walled enclosure of *pookanaka* class now destroyed." At the location mentioned there is nothing to indicate a structure but a pile of rocks gathered from a cane field. (*Ibid.*: 112)

While the map in Bennett's volume is not very detailed, it does not seem likely that any remaining features within the project area are sites identified by him (Figure 7). Several heiau recorded by Thrum on Kaua'i could not be relocated by Bennett:

Site 8. Peemoa heiau, in Makaweli. Described by Thrum as "An unwallled heiau." (*Ibid.*: 152)

Site 9. Kapakaniau heiau, in Makaweli. Described by Thrum as "A paved, open platform heiau; in good condition." (*Ibid.*)

Site 10. Naulili heiau, in Makaweli. Described by Thrum as, "An unwallled sacred place; flat ground." (*Ibid.*)

With the exception of Aakukui heiau, three heiau that had been identified in 1886 by a local informant in 1886 named Kanakalelele, were not located by Bennett.

1. Aakukui was a heiau that stood at Kekupua.
2. Kaumuloa was another.
3. Kuanalili was another.

These were heiaus in which human sacrifices were offered, but Kuanalili had a *lele* altar, that is, a high place on which to lay the victims. When the kahuna thought that it was the proper time, then the victims were carried to Aakukui or to Kaumuloa. Kapuahi and Aimoku were priests who officiated in these heiaus. There were more priests but these were the principal ones. Knumualii was the chief to whom these heiaus belonged. There are no other places of importance there. (Lahainaluna Student Papers)

2. House Sites & Agriculture

House sites were a common feature lining the rivers in Makaweli and Waimea. The houselots located by Bennett were found further up the valleys close to agricultural sites, and away from the present project area.

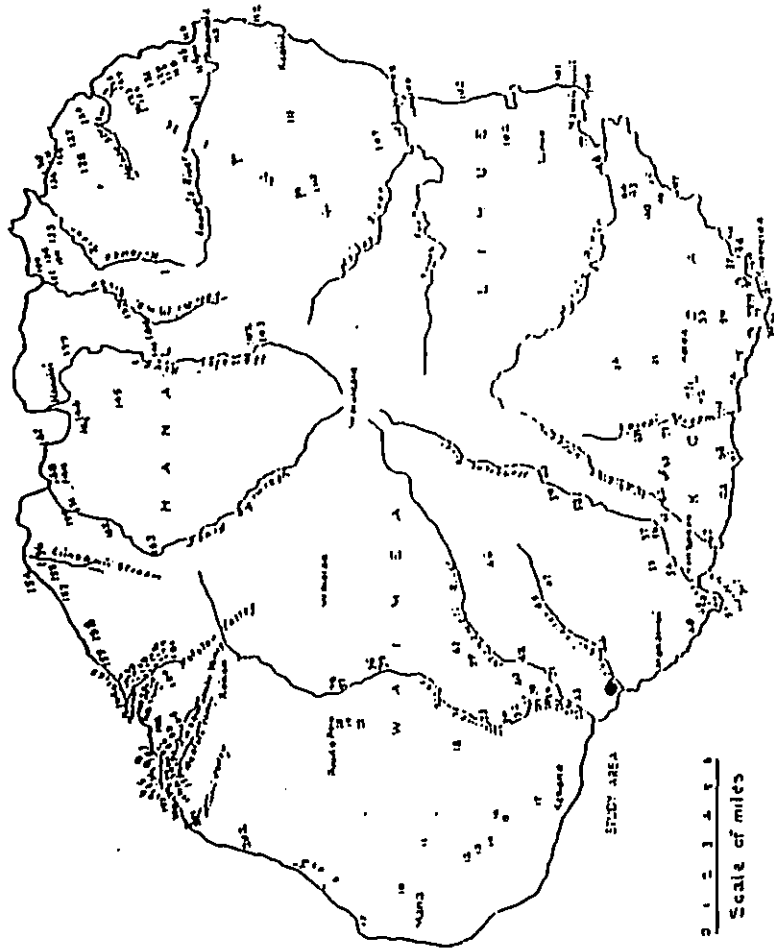


Figure 7 Index Map of Kaua'i Showing Location of Archaeological Sites, taken from *Archaeology of Kaua'i* (Bennett, 1931: p.98); no north arrow.

Site 27. House sites.

Along the base of the bluffs on both sides of the river, after getting up past the branch of the Makaweli and Waimea rivers, there are built-up stone house sites. In some places these facings run for over 100 feet along the base of the bluff, with the paving extending back 15 feet or more. At other places the terrace is just sufficient to maintain one house. On the east side of the river, on the steep talus slopes, there are house sites with terraces as high as 8 feet to maintain a level platform for a house. (*Ibid.*: 106)

Site 42. Taro fields and house sites, in Makaweli and Olokele valleys.

"The taro terraces and house sites, utilizing as much of the flat lands as possible, and terracing a bit on the sides, are much the same as in Waimea valley." (*Ibid.*: 111)

Site 46. Taro fields and house sites in Kawaiipapa Valley.

"The valley is well terraced where convenient though no great labor has been expended in irrigating the higher, though fertile land. The terraces and the house sites on the edge of the valley are interesting as they show a fairly large population quite a ways inland." (*Ibid.*: 112)

Site 47. Taro fields and house sites in Honunula Valley.

"This valley shows considerable taro terracing, as well as walled inclosures that look like pigpens. The part toward the sea of this valley is utilized for sugar cane and so all that is left is the outer rim. As such it would indicate fairly extensive work lower down in the valley." (*Ibid.*)

3. *Hāua (recreational) Slides*

There is a brief mention of a *hāua* slide in Makaweli: "A hill named Puuhobua in Makaweli was probably another slide" (*Ibid.*: 55). There was no site number designation.

4. *Salt Production*

Another point of interest is the Makaweli red salt. Referenced in the following passage, Site 49 is closer to Hanapēpē than to the present project area:

"The manufacture of salt has always been important among the Hawaiians, and Kāua'i was famous for the red salt of Makaweli (Site 49) made by mixing ordinary salt with a little red dirt. Ellis (18, p. 376.) describes the method of salt manufacture on Hawai'i:

They have generally one large pond near the sea into which the water flows by a channel cut through the rocks or is carried thither by the natives in large calabashes. After remaining there some time, it is conducted into a number of smaller pans about 6 or 8 inches in depth which are made with great care, and frequently lined with large

evergreen leaves in order to prevent absorption. Along the narrow banks or partitions between the different pans we saw a number of large evergreen leaves placed. They were tied up at each end so as to resemble a shallow dish and filled with sea water in which the crystals of salt were abundant." (*Ibid.*: 24)

B. More Recent Archaeological Research

More recently, the major focus of archaeological research in the vicinity of the project area has been the Russian Fort. In 1816, Hawaiians and the Russian-American Company built "Fort Elisabeth". A great deal of information on this site is presented in the following three documents:

McCoy (1972) performed some of the first detailed recording of testing in and around Fort Elisabeth. He recorded Fort Elisabeth as State Site # 50-30-05-1000. Of greater interest to the present project area were the other two sites he recorded. State Site # 50-30-05-1001 is described by McCoy as a late prehistoric coastal site. He recovered numerous traditional Hawaiian artifacts and cultural deposits. He also identified a possible burial feature. State Site # 50-30-05-1002 is a single course, right-angle alignment 13m (41.6 ft.) on one side and 5m (16 ft.) on the other.

Following the 1972 findings, Hommon *et al.* (1975: 123) performed backhoe testing and identified a possible *imu* and two burials in trenches X-13 and X-14 south of the Russian Fort.

Mills (1996) reports on the ethnohistory and archaeological findings at the fort. His dissertation focused on the role Hawaiians played in the history of the fort.

On the other side of the project area to the southeast, McMahon (1993) assessed the inadvertent discovery of a coastal burial. State Site # 50-30-09-6011 is located just south of the inlet of Mahināuli Gulch, and just north of the Robinson Landing barge harbor. The discovery exposed a cultural deposit including midden and basalt debitage. It was unclear whether the burial was Hawaiian or historic.

In nearby Waimea town there have been numerous archaeological studies. The majority of the state site designations have been associated with burials. A brief summary of the findings in Waimea follows:

In an early work, Soehren (1962) reported on sites at Waimea, Kāua'i. He located the remains of a low stone platform on a knoll between 350 and 400 feet in elevation. It measured 44 feet by 83 feet with walls up to 4 feet high. He surmised that the size and location of the structure strongly suggest that it was once a *heiau* in an area of terraces. However, he concluded that it was not sufficiently well preserved to warrant preservation.

In an area much higher up in the valley, Newman (1970) found a small agricultural area in the Waimea Heights Houselots. At around the 325 foot elevation, there was a series of

parallel rows of stones in an area measuring 30 feet by 40 feet. No site number was assigned.

Cox (1975) found a total of nine widely scattered burials along Kaunualii Highway, between the intersection with Ala Wai Road on the southeast and Onoona Road on the northwest, designated State Site Numbers 50-30-05-3250 through -3256 and 50-30-05-3244 through -3246 (10 sites). Salvage operations were undertaken, and traditional and historic artifacts recovered. Most site numbers reflected individual burials.

In a report concerning a waterline excavation near the upstream Waimea Stream pumping station, Kikuchi (1983) describes a burial (State Site # 50-30-09-1870) and the Pe'e-Kaunai Ditch (State Site # 50-30-09-26).

In 1993, Gerald Ida and Hallett Hammatt found a 20th century trash pit while on an archaeological survey of the Campos Property in Waimea.

Also in 1993, but six miles up Waimea Canyon, McMahon (1993) recorded five burials in a cave in an area of rock walls, enclosures and platforms designated State Site # 50-30-06-498.

The presence of grave sites (State Site Numbers 50-30-05-1853 and 50-30-05-1854) was noted just west of the restaurant at Waimea Plantation Cottages (Sinoto, 1993).

An early date was reported from Waimea Town by Harriott *et al.* (1993). An inventory survey of approximately 1 acre identified a prehistoric cultural layer (State Site # 50-30-05-4012) and 1 burial believed to be prehistoric. The layer was charcoal carbon dated to A.D. 910-1275.

Recently, in Waimea Town, two historic cave burials - State Site Numbers 50-30-05-636 and 50-30-05-637 - were located by McDermott *et al.* (1997).

There are at least 18 sites recorded in the greater Waimea Town area. The majority of these are burials. Very little reference is made to Waipao and A'akukui valleys which lie mauka of the project area (Figure 8; see also Appendix 3).

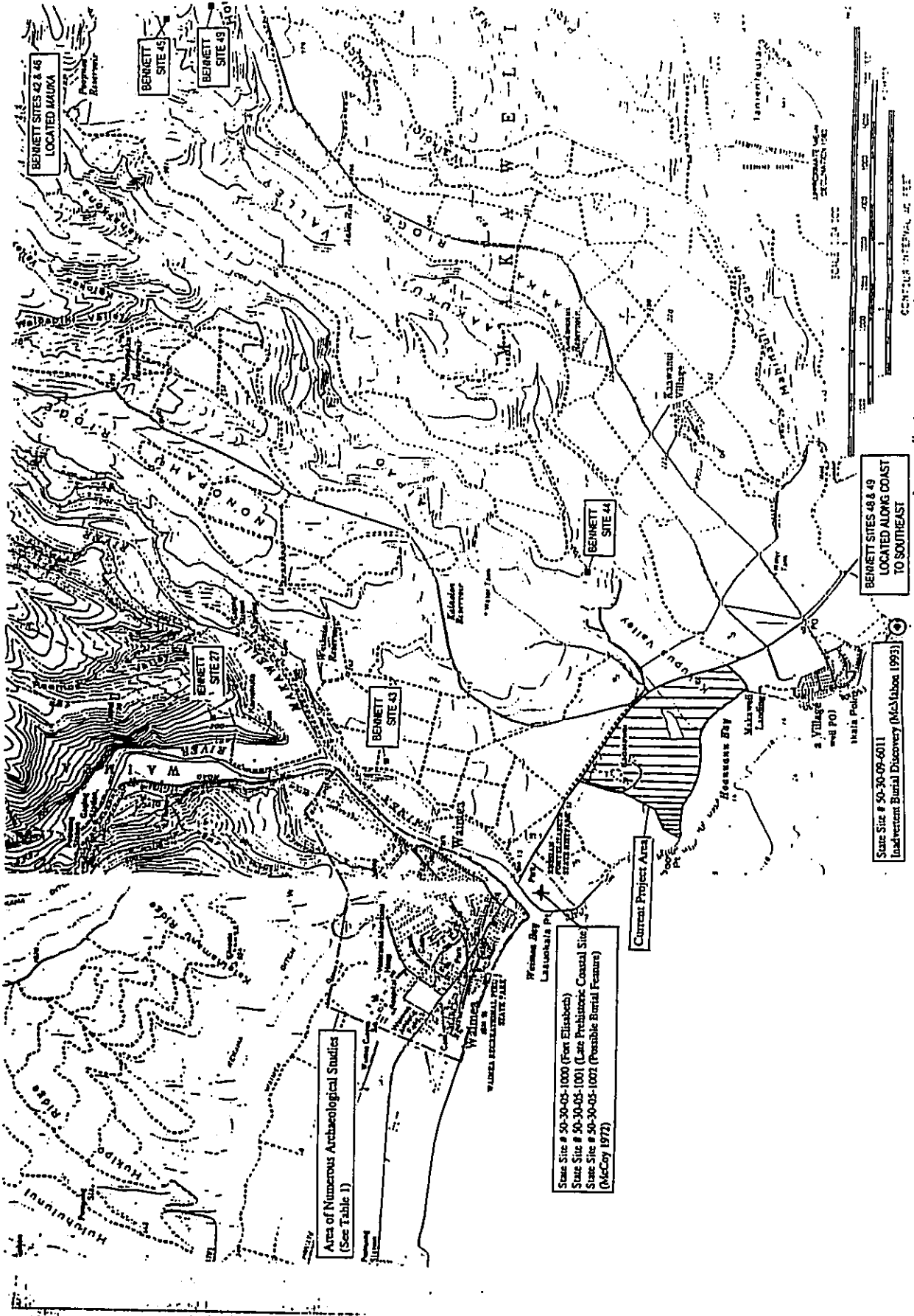


Figure 8 Portion of USGS 7.5 Minute Series with previous archaeology in area.

V. SITE DESCRIPTIONS

Six historic properties were identified during the inventory survey (see Figure 5 above). These sites have been recorded with the DLNR/SHPD and assigned State Inventory of Historic Places site numbers. Three of the sites are single-feature sites, and three are multiple-feature sites.

State Site # 50-30-9-762

General Description: Site 50-30-9-762 is a series of rock walls, a terrace, and an iron try-pot. The walls are located in and around the workers camp area (Lot 1). There are two walls lining the main driveway (Features A and B). Feature A also serves as part of the western property boundary. One wall follows the old government road and serves as a northern boundary (Feature C). Another wall intersects with Feature A and continues *makai* as the western project area boundary (Feature D). There are several wall segments in the camp area that partition house lots (Feature E). The terrace is *mauka* of the houses in the camp area (Feature F). The try-pot (Feature G) is located at the *mauka* end of Kekupua Fishpond.

An interview with Warren Robinson regarding when the walls were built provided the following information:

WR: . . . I would assume that they were built when they [Sinclair-Robinson family] purchased the place and probably through the years after that.

This would date the walls and terrace as post 1865, when Eliza Sinclair purchased the *ahupua'a* of Makaweli. Thus, Site # 50-30-9-762 was determined to be historic and related to the Robinson era of occupation.

Feature #: 50-30-9-762A
Feature Type: Rock Wall
Feature Function: Boundary
Length: 417m (1,334 ft.)

Description: Feature 762A is a rock wall which runs along the Waimea side of the curved main driveway (see Figure 32 below). Its northern terminus is a cut rock column with a wrought iron gate (front gate). The southern end is at the bridge spanning a water ditch where it adjoins a wooden fence. The wall is constructed of basalt boulders stacked 3 to 5 courses high. There is considerable cobble chinking which indicates some care was taken in its construction. The wall is .95 - 1m (3 ft.) wide and 1 - 1.1m (3 ft.) high. There is no mortar evident. The northern half of this wall acts as the western boundary of the project area.

Feature #: 50-30-9-762B
Feature Type: Rock Wall
Feature Function: Barrier
Length: 417m (1,334 ft.)

Description: Feature 762B is a rock wall which runs along the Hanapēpe side of the main driveway (see Figure 33 below). It parallels Feature 762A, the wall on the other side of the driveway. Its northern terminus is the other half of the front gate with a cut rock column and a wrought iron gate (see Figures 34 & 35 below). The southern end is at the bridge spanning a water ditch and ending with a rock column. The wall is constructed of basalt boulders stacked 3 to 5 courses high (1m, 3 ft.). There is cobble chinking. The wall is .95 - 1m wide (3 ft.). There is no mortar evident. Cactus is growing on the top surface.

Feature #: 50-30-9-762C
Feature Type: Rock Wall
Feature Function: Boundary
Length: 755m (2,416 ft.)

Description: Feature 762C is a rock wall that runs *makai* of the old government road. This wall is the northern boundary for the project area. The wall is of core filled construction. It measures .90m (3 ft.) wide by 1.10m (3.5 ft.) high. It stands 4-5 courses high (see Figure 36 below). A major portion of the central segment of the wall has degradation from adjacent cane operations and growth of bougainvillea. Because of the dense bougainvillea growth, the wall is not visible in its entirety. This wall runs from the front gate on the east side of the driveway to its terminus at an irrigation ditch.

Feature #: 50-30-9-762D
Feature Type: Rock Wall
Feature Function: Boundary
Length: 584m (1,868 ft.)

Description: Feature 762D is a rock wall of core fill construction. It measures 3 - 4 courses (1m, 3 ft.) high, by 2m (6.5 ft.) wide. This wall has very little chinking in its construction. This wall runs along the western boundary of the project area (see Figure 37 below). In general this wall runs northeast to southwest. There is a distinct bend in the wall where it turns from 228° to 269°. This bend ties in the datum on State Site # 50-30-9-763 (platform). The platform abuts the eastern side of the wall. The *makai* end is approximately 78m (250 ft.) from the beach. Here a barbed wire fence continues on to the southwest corner of the property. The area just outside the project area has been cleared and the bulldozer push lies up against the west side (outside) of the wall. This wall is bisected by the driveway, and the two walls that line the driveway. At this juncture the western boundary of the project area changes from Feature D (wall) to Feature A (wall). Wall Feature 762D continues northeast on the opposite side of Feature 762B (wall) after it is bisected. At this point it is within lot 1, the workers camp. This wall is bisected two more times within the workers camp by dirt roads. Inside the camp area the wall is more narrow, measuring 1m (3 ft.) wide.

Feature #: 50-30-9-762/E
Feature Type: Rock Walls
Feature Function: Boundary
Length: 151m (493 ft.)

Description: Feature 762/E is a series of rock walls within the workers camp. The walls generally run northeast to southwest. They are associated with the houses built here, and act as informal property lines. These walls are generally 3-4 courses (.85m, 2.5 ft.) high and 1.10m (3.5 ft.) wide. The original wall is core filled. There are many rebuilt places along the walls that are constructed of simply stacked freshly excavated boulders with heavy equipment scars and large chunks of concrete (see Figure 38 below).

Feature #: 50-30-9-762/F
Feature Type: Terrace
Feature Function: Agriculture
Length: 39m (125 ft.)

Description: Feature 762/F is a rock terrace. It measures 2-3 courses (.70m, 2 ft.) high by .80m (2.5 ft.) wide. This terrace runs roughly north to southwest. Both ends appear to have been cut by bulldozing. Presently, the terrace is covered in prickly pear cactus (see Figure 39 below). There is a great deal of historic debris covering the terrace including lumber, metal, corrugated metal roofing, and animal feeding troughs.

Based on the presence of historic trash perceived as agricultural in nature and informal discussions with past and current residents of the "camp area", this rock terrace was determined to be an animal enclosure. At one time, this area was used for the Robinson family's vegetable garden.

Feature #: 50-30-9-762/G
Feature Type: Iron pot
Feature Function: Rendering Whale Blubber/Cattle Feed Container
Length: 1.0 m (3.28 ft.)

Located at the mauka end of the fishpond, near the pump house, is another agricultural artifact, an iron try-pot (see Figure 26 below), whose primary function *in situ* was for agriculture. The try-pot is a remnant left over from the whaling era. Historically, try-pots were used on whaling ships for boiling out oil from whale blubber. A factory was built aboard the ship's deck for this purpose. A brick housing called the 'caraboose' held the try-pots in place and, were filled with sea water so as to form a shallow pool, which also served to protect the deck from fires lit beneath the try-works. The try-pots were designed to have flat sides so they could butt up against each other, thus utilizing less space aboard the ship's already overcrowded deck. The average try-pot held about 250 gallons of whale oil (Simpson 1986:84).

An interesting note is that the term 'ākaletāao which means "iron bottom" (Puku i & Elbert 1986:282) takes its name from the iron try-pot which was used as a still to distill liquor made from the *tī* root. An amusing anecdote is that when you put two try-pots together side by side, the shape resembles the buttocks from which derived the term "iron bottom" or 'ākaletāao (Susan Remoaldo 5/21/99; personal communication).

The iron try-pot seems to be in fair to moderate condition. It measures .70m (2 ft.) in height and 1m (3 ft.) in width with a diameter of 1.10m (3.5 ft.). After the demise of whaling in Hawai'i, the try-pots were incorporated into the sugar and ranching industry. At Kapalawai, try-pots were put out in the pastures as feeding stations for the cattle and were filled with sugar molasses. The cattle would lick the molasses, making them thirsty and encouraging them to drink water so they would not get dehydrated. At one time, iron try-pots could be found in every pasture (Hakila Callahan 5/18/99; personal communication). This is the only try-pot remaining on the Kapalawai property today.

State Site # 50-30-9-763

Description: Site 763 is a large oval platform measuring 48.5 m (155 ft.) long north to south by 23 m (73.5 ft.) wide east to west (Figure 9). It is constructed on level ground. There is rocky soil with small bedrock outcrops in the area. The platform is constructed of *pāhoehoe* cobbles and boulders .05 - 1 m (2 in. - 3 ft.) in diameter. In profile, the platform is highest at the southern end where it is 2.5 m (8 ft.) above ground surface. It gradually slopes downward toward the northern end where it's a single course, .6 m (2 ft.), high. It was observed that the platform rises .37 m (1 ft.) over 15 m (50 ft.) from mauka to makai. The ground surface along the eastern side of the platform slopes downward toward the ocean at a rate of .30 m (1 ft.) over 15 m (50 ft.). The surface of the platform is relatively even with five distinguishing characteristics: a ridge down the middle, two paved depressions (paths), a mound, and a square pit. Large boulders are found around the perimeter of the feature with small boulders and cobbles found mainly on the upper surface. The base around the perimeter is presently piled. The upper surface of the feature has a mounded ridge extending almost the entire length of the platform. This ridge measures 2.7 m (8.5 ft.) wide and 1 m (3 ft.) high. It extends to the furthest point north. This ridge is constructed of piled boulders, and is wider at the base than the top. On either side of the ridge are two linear paved depressions that run almost parallel North/South (see Figure 40 below). They are paved with cobbles and small boulders. These depressions are .10-.20 m (4 - 8 in.) below the placed cobbles and small boulders which line them. These features appear as paths (see Figure 41 below). The western depression has a square 2 m (6.5 ft.) pit built into it. The pit has walled edges formed by small boulders stacked to four courses high. It is .40-.70 m (1 - 2 ft.) deep. There is a mound on top of the platform in the southeast quadrant (see Figure 42 below). It measures 7 m (22.5 ft.) long x 1.5m (11 ft.) wide x 1.25 m (4 ft.) high. The mound is built of piled boulders, and is of similar construction as the ridge. It is oval in shape with the apex in the center. The exterior of the platform appears altered. The western edge of the platform abuts a rock wall that functions as the western project area boundary (see Figure 43 below). It is possible that rocks were taken from the platform and used in the construction of nearby

walls. The bulls that roam freely in the area could have also altered the edges of the feature. There are several large (old) *kiawe* trees growing through the platform which indicate the platform has remained where it is for many years. There is deadfall over its surface. The platform is in fair condition.

Interviews with individuals familiar with the property describe the platform as a clearing pile (interviews with Hakila Callahan, 5/18/99, and Warren and Bruce Robinson, 5/21/99). Mr. Hakila Callahan (age 65) who visited the property from his home on Ni'ihau as a child, related the following regarding the platform:

CSH: What do you know about it [the platform]?

H0: That's the rock from Akia 1.

CSH: What is Akia 1?

H0: That's the cane, you know where the corn is right now?

CSH: Oh, that's where they plowed that whole field.

H0: The whole place. Yeah. That place had nothing but rock. So they went clean that place up, the rock, and they went take the rock and pile it over there on the railroad track.

CSH: What railroad track?

H0: They used to get, you know, in the old days. Never had truck before. They used to pull with the tractor. The Robinsons used to get railroad track. So that's how use to, they pile 'em up there, the pile stone. When they tell me the archaeology went over there and put ribbon over there 'cut *heiau*, that's not no *heiau*. That's all the stone from there. When they went clean that place up, right after that, the war went break out in 1941. So they had only cattle in there. Then they stop. After the war, then they plant cane inside their place.

CSH: In Akia?

H0: Akia 1. That's where all the stone came from.

Discussions with Warren and Bruce Robinson substantiate this. However, informal discussions with people who did not wish to be interviewed or named in this report indicated some community concern that the structure was solely a clearing mound.

Based on this and on the unusual pre-contact style of construction of this rock platform, a second period of field work was devoted solely to determining the function and age of this structure and trying to resolve the nature of this site. There are puzzling features which make us question the sole function of this rock platform as a clearing mound. These include a roughly level surface paved with cobbles, and a well constructed pit feature. As such, this structure does not appear to be an arbitrary field clearing pile. The fact that no midden, charcoal or artifacts were found — not even an iota of historic trash was found, makes defining its age and function a problem. Further, no references to this structure could be located in any previous archaeological or historical source. Another point for consideration is community concern that the structure be preserved until such time that more conclusive evidence turns up and a definite age and function can be determined. Based on the above, our findings remain inconclusive and the function of this large, paved

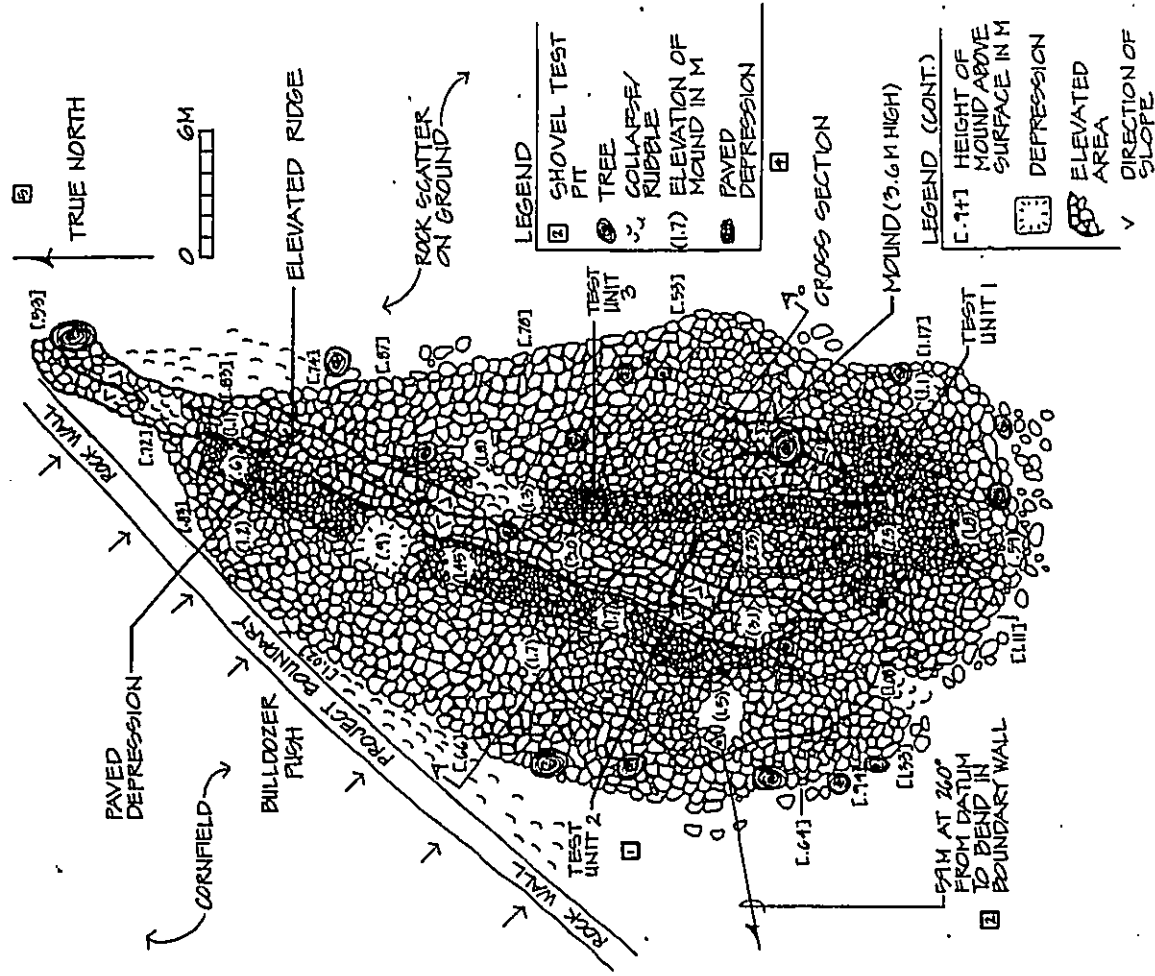


Figure 9 Plan view drawing of platform (State Site # 50-30-9-763).

platform remains questionable.

Taking into consideration the long land tenure of the Sinclair-Robinson family (135 years), it is feasible that the structure was constructed prior to 1865 and that it was used as a clearing mound in the 20th century when the adjacent field was cleared for growing cane. It would not seem unlikely that any rock piling during the Robinson tenure would have been on a pre-existing pile of rocks. It does seem possible that, prior to such a massive clearing endeavor, there was a previously existing culturally modified bluff on the site, which might account for the constructed pit feature. Just as likely, it is possible that the apparent "paving" of the surface was simply done to facilitate the laying of temporary track for a tractor-pulled operation clearing an adjacent field of stone just prior to World War II.

Due to the uncertainty over the function and the community concern raised, we have recommended Site 763 (rock platform) for preservation. The landowner has agreed to such an arrangement.

State Site # 50-30-9-764

General Description: Site 764 is the main house complex of the Robinson Homestead, located in Lot 1. The site includes 14 separate structures. These buildings include: A) the main house, B) the guest house, C) offices, D) the carriage house, E) the tack room, F) the greenhouse and G-N) employee cottages. The main house was constructed by 1897. The other structures may date from around the same period, but some may date from as late as the 1920's. This site is situated in the northern quadrant of the project area. It has a fence protecting the grounds from cattle pastures around it. The grounds are maintained regularly by workers. Several of the structures are in use today, others are in disrepair.

The documentation of these architectural structures fall outside our realm of expertise and an evaluation is being conducted by Mason Architects, Inc.

Also within this area (Lot 1) are eight plantation style camp houses which continue to be used as employee residences (Pers. Comm., Kalā Kapahu). The "camp area" is comprised of eight modest houses with gardens, *lo'i* and animal enclosures which the employee residents maintain for their personal use. The architectural structures within the "camp area" are beyond our expertise to evaluate. In consultation with Mason Architects, Inc., it has been agreed to designate each house as a separate feature of Site #764. It is our understanding that, if feasible, the camp houses, which are so typical of the "plantation era", might be renovated and maintained to add to the ambiance of the property. The final disposition of these cottages will await architectural evaluation.

Feature #: 50-30-9-764/A
Feature Type: Historic House
Feature Function: Habitation
Approx. Area: 6,484m² (20,750 sq. ft.)

Description: Feature 764/A is large single story wooden house. This main house was built

by 1897 (oral interview with Warren Robinson, 2/17/99). It is basically a square house in plan view measuring 39m (125 ft.) x 39m (125 ft.) with an open courtyard in the center. Additions made to the square plan view are guest bedrooms off the eastern corner, and living quarters with a large kitchen off the western side of the house. A roofed porch runs around three sides, and the center courtyard. The front porch has a view to the southwest of the ocean (see Figures 44 & 45 below). The house is in good condition, contains many original furnishings, and is slated for renovation and use as a museum. In the front yard of the house is a circular rock terrace which contains four cut block boulders. These cut blocks are similar to the ones found exclusively in Waimea as part of the Menehune Ditch (see Figures 46 & 47 below).

Feature #: 50-30-9-764/B
Feature Type: Historic House
Feature Function: Habitation
Approx. Area: 602m² (1,925 sq. ft.)

Description: Feature 764/B is a guest house. It is a wooden structure rectangular in shape. The guest house was built off the west corner of the main residence, and is detached from it. This house faces the southeast, has an attached carport, and is in good condition. The guest house is presently used as an employee residence (see Figure 48 below).

Feature #: 50-30-9-764/C
Feature Type: Historic House
Feature Function: Habitation
Approx. Area: 1012m² (3,239 sq. ft.)

Description: Feature 764/C is a single story wooden structure that was built off the northwest side of the main house. It was formerly used as the servants quarters. It has been converted into office space and is currently used as such. It is in good condition (see Figure 49 below).

Feature #: 50-30-9-764/D
Feature Type: Historic Structure
Feature Function: Carriage House/Garage
Approx. Area: 602m² (1,925 sq. ft.)

Description: Feature 764/D is a large two story wooden structure. The flooring on the inside is wood plank. The building was constructed north of the servants quarters. Originally, this was used as the carriage house. Today, it's a garage for several cars and two carriages. There is a ramp constructed off the back of the garage designed to service vehicles. Presently, the entire building is leaning, a significant portion of the roof is gone, and the staircase to the second floor has collapsed. This structure is in poor condition (see Figure 48 below).

Feature #: 50-30-9-764/E
Feature Type: Historic Structure
Feature Function: Tack Room
Approx. Area: 113m² (360 sq. ft.)

Description: Feature 764/E is currently only a remnant. It was formerly the tack room. This structure was attached to the eastern side of the carriage house. The floor and the foundation are all that remain intact. Presently, on the floor's surface is wood from the walls and roof intermixed with equestrian tools (see Figure 51 below).

Feature #: 50-30-9-764/F
Feature Type: Historic Structure
Feature Function: Agriculture
Approx. Area: 133m² (425 sq. ft.)

Description: Feature 764/F is a vacant plant house in poor condition. The structure is rectangular and made of wood (see Figure 52 below). The dirt floor has been excavated 1m (3 ft.) below the ground surface (see Figure 53 below). The walls of the excavated portion are lined mostly with hollow tile, but also basalt boulders. The hollow tile may have been a later addition. The steps at the entrance are cut basalt. The roof is damaged.

State Site # 50-30-9-765

Description: Site 765 is a 6-acre inland fishpond (Figure 10) identified by DHM Planners, Inc. et al. (1990: 186) as Kekupua Fishpond. It measures approximately 309m at its longest dimension by 120m at its widest (989 x 384 ft.). This feature is a large enclosure constructed of pahoehoe cobbles and boulders to .80m (2.5 ft.) in diameter. They are stacked 2-8 courses high (.30 - 1.6m, 1 - 5 ft.) around the perimeter of a pond of fresh water. The wall is discontinuous. Some areas around the perimeter have been disturbed by cattle (see Figure 54 below). Other spots have fallen trees or vegetation covering the perimeter wall. Of the wall that remains, the majority is 2-5 courses (.40 - .90m, 1.5 - 3 ft.) high. In addition to the wall constructed around the perimeter, there is a wall which transects the width of the pond. It is located at the western end of the pond, and essentially splits the pond into two unequal parts. The wall is constructed of basalt cobbles and boulders. This wall is approximately 6 m (19 ft.) wide, and 110 m (352 ft.) long. Coconut trees are planted along its entire length down the center. In its present state the wall has a layer of dead vegetation covering the upper surface (see Figure 55 below).

There are a number of historic modifications to the pond. The gate at the southern end is made of concrete (see Figure 56 below). It measures 1.8m² (5.5 sq. ft.). At the opposite end of the pond from the gate, a pump house was erected on a concrete slab (see Figure 57 below). The shack is made from corrugated metal. Inside, there is a combustion engine attached to a 6" cast iron waterline. One end of the waterline goes to the pond, and the other end runs out of the pump house to the north where it becomes subterranean. There are three natural springs located within the pond. One spring is named Kahe, one spring

is named Kekupua, and the third is Ma'o (oral interview with Bruce Robinson, 5/21/99). Water was pumped out of the pond for use on the rest of the property. Approximately 35m (112 ft.) along the east side of the pond from the pump house are two portable engines (pumps) and 6" PVC piping. This apparatus is used to drain the pond.

There are a number of different types of vegetation in and around the pond. There is a row of coconut trees planted around its perimeter. There are many opiuma trees, some monkeypod, and banyan trees. There are *milo* trees in the southwest corner near the gate. In the vicinity of the drainage pumps are *tau* and *iima*. Many assorted low grasses and shrubs grow around the perimeter. Within the pond itself there is bullrush and waterlily. The growth within the pond is so thick that one can find very few spots to actually see the water (see Figures 58 & 59 below).

The datum point is located on the wall of the pond at the northernmost end. This datum is tied into the northwest corner of the bridge on Kaunualii Highway which spans Mahikona Stream. The pond has been used for fish farming for many years. In its present state it has extensive historic modification.

Kekupua Fishpond History: Information regarding the fishpond in historical documents was minimal. Details concerning how and when the pond was constructed were not available. Coring samples taken from the pond on 5/29/99, may reveal data not available in historical sources (see Section VIII below).

The size of the pond is approximately six acres and is quite large for an inland pond. Most often, large ponds were reserved for *aifi*. This may have been true for Kekupua Pond as well. The Land Commission Award documents mention the pond in two claims: LCAs #2290 and 2291. In these claims, the pond was referred to by two names: Kahe and Kekupua. This conflicting information was explained by Bruce Robinson in an interview conducted on May 21, 1999. The pond is fed by three fresh water springs, all of which have separate names. The names of the three springs are Kahe, Kekupua and Ma'o. The few *kipuna* born in the early 20th century who remember the fishpond said they knew the name always to be Kekupua.

The only known story relating to the fishpond centers around a *mo'o wahine* (a fresh water mermaid with the ability to change into a partially human form) who is said to reside in the pond. Legend has it that she can be seen in the early mornings sitting on a particular *pōhaku* (rock) just before sunrise. The stone was described as being flat and oblong in shape. It used to lie about a foot under water, near the pond's northeast edge. However, the water level has surely changed over the last fifty years. There is also a particular monkeypod tree and coconut tree which mark the spot where the *pōhaku* is said to have been. While the name of the *mo'o wahine* is not known, it is probable that there is an older name for the pond which relates to the legend in some way (Interview with Hakila Callahan, 6/18/99).

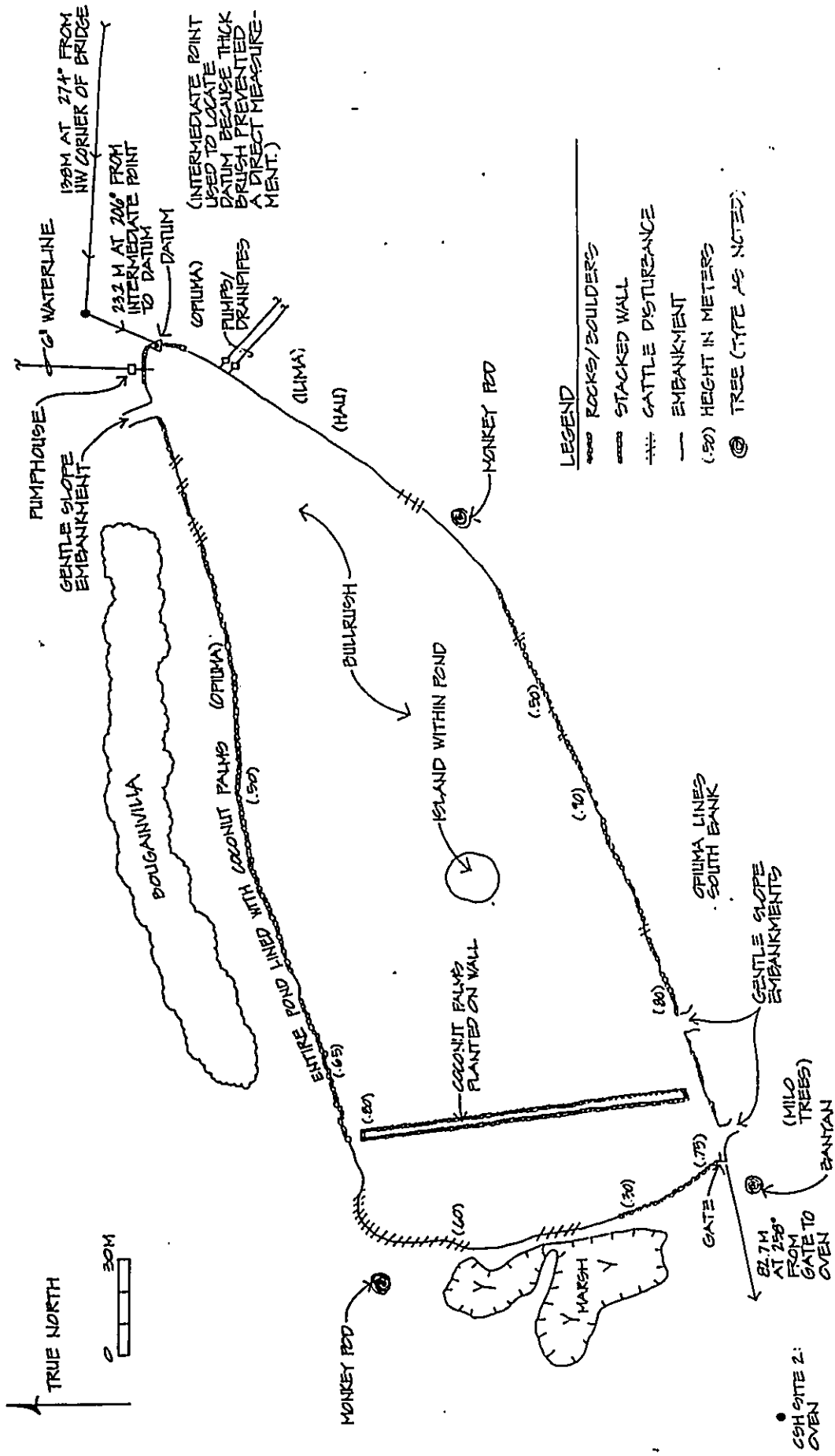


Figure 10 Plan view drawing of Kekupua Fishpond (State Site # 50-30-9-765).

State Site # 50-30-9-766

Description: Site 766 is a mortared stone and brick structure commonly referred to as a "Portuguese Oven". Immigrants from Portugal introduced this type of wood-fired outdoor oven to Hawaii (Figures 10 & 11). The oven is 1.9m (6 ft.) wide and 2m (6.5 ft.) long. The front of the oven is 1.65m (5.5 ft.) high, rising to a gentle peak (see Figure 60 below). The oven opening is .40 m (1.5 ft.) tall, .24 m (9 in.) wide at the top, .28 m (1 ft.) wide at the bottom formed from red brick on the top and sides with a heavy oxidized, 3-ply sheet-metal piece supporting the brick over the portal. The bottom of the opening is formed by two basalt slabs set side by side which extend .12 m (5 in.) out from the oven to form a small apron. Extending out from either side of the apron to the side edges of the oven front is a narrow .05 m (2 in.) ledge formed of rock and mortar. Below the opening, at ground level, is a rectangular indentation .30 m (1 ft.) deep, .35 m (1 ft.) high, .30 m (1 ft.) wide which served as an ash collection area. On the interior floor of the oven, just inside the opening is a hole .12 m (5 in.) square which connects to the ash collection area below. This feature allowed the remaining ashes from the oven heating fire to be swept into the square hole and drop into the collection area where a suitable container could be placed. On the front of the oven, from the ground surface up to the ledge is a straight vertical face. From the ledge to the peak, the face is angled back 3°. The back of the oven rises 1.10 m (3.5 ft.) at 10° from vertical. From this point it gently slopes upward to meet the high peak of the front. On top of the oven is a heavy layer of mortar with only a few rocks exposed. The top has a definite peak and hips at the front of the oven, but the peak flattens out toward the back of the oven. The interior of the oven is circular, 1.30 m (4 ft.) in diameter, with a dome ceiling .65 m (2 ft.) high. The interior is entirely made up of mortared red brick. The thickness of the brick at the opening is .20 m (8 in.). There has been some upward buckling of the interior floor. On the exterior there are several large cracks in the mortar. A large separation that runs across the front of the oven may be due to the vertical expansion of the metal plates because of oxidation. The front of the oven generally faces North. The historic oven is in good condition. The oven is located 82.7 m (264.5 ft.) at 258° from the fishpond gate.

Specific History: The Portuguese oven at Kapalawai was built by John Rita. He worked as a milkman for the Robinson family and lived in a house which was located approximately 20 yards east of the oven. Interviews with informants and specifically with Warren Robinson and Bruce Robinson did not provide any information regarding construction dates of any of the buildings on the property. Thus, it is not known when the Rita house was built. It would be safe to conjecture that the house was built in the late 1800's or early 1900's after the main house was built. The Sinclair-Robinson family did maintain a dairy and the house seems to have been built for the purpose of housing a milkman/dairyman. The house apparently fell into disrepair after the Rita family moved away in the late 1940's and is no longer standing. No remains of a house was observed. The Ritas were the only Portuguese family living at Kapalawai. John Rita built the oven for his wife, Mary, to do the family baking. The oven was used up until the late 1940's when the Rita family moved to O'ahu (Edith Pavao, daughter of John Rita: pers. comm. to K. Mc Guire).

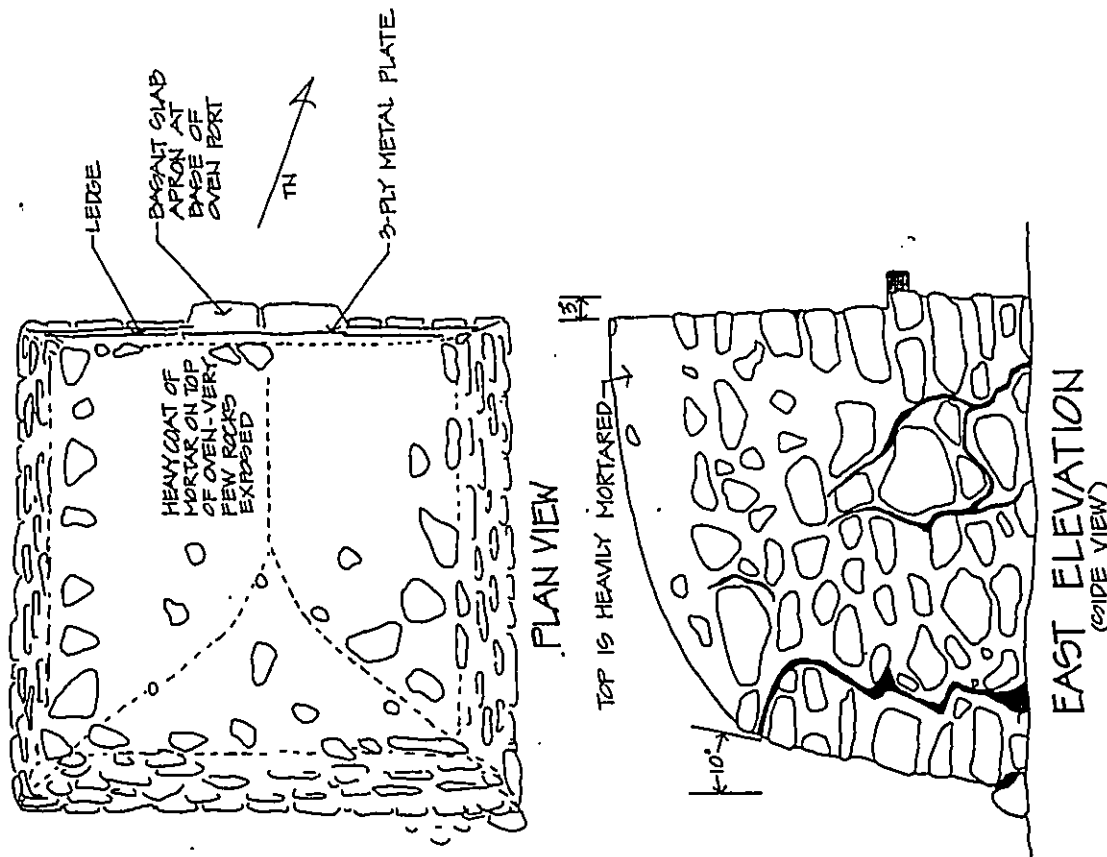


Figure 11 Plan / front view drawings of Portuguese oven (State Site # 50-30-9-766)

This oven was constructed in the basic "igloo" shape. Compared to other ovens, it has several distinct variations. The bricks that line the inner oven walls are unusually large as compared with other ovens. Also, an inner mouth for removing the ashes was built just inside the doorway opening (see Figure 61 below). Usually the ashes would be scraped out through the front opening and, once the bread was placed inside, a metal plate was put in place to serve as a door. Construction of an inner mouth is a curious feature of the basic oven design. Having an opening just inside the outer opening would allow for heat to escape out the bottom during baking. It is not currently known how many Portuguese ovens still exist on Kaua'i. This oven is an example of the rich culture of the Portuguese on Kaua'i, and further adds to the historical heritage of Kapalawai.

General History: Although it is documented that the Portuguese arrived in Hawai'i as early as 1838, the formal immigration period is considered to have begun on September 30, 1878 when the first band of 180 Portuguese immigrants arrived in Honolulu. Introduced as plantation laborers, they brought their families and their culture with them (Toni DeMello 6/4/99; pers. comm.).

One aspect of culture the Portuguese brought with them was the *forno* (pronounced "funo") or oven in which they baked *pao duce* (sweet bread) and other kinds of breads and baked goods. The *forno* was also used to bake meat roasts and other main dishes as well. Most *forno* could bake 10-12 loaves of bread at one time. The bread dough was prepared the night before and allowed to rise. Early the next morning, a wood fire was started in the oven. When the wood burned down, the ashes were removed with a scraping implement. The bricks were quickly wiped down with a damp mop to remove all remnants of ash which would discolor and blacken the bottom of the loaves if not removed (Toni DeMello 6/4/99; pers. comm.). To test the temperature of the oven, a handful of flour was thrown into the oven. A good baker could tell by the color of the flour and by how quickly it browned if the oven temperature was just right for baking (Susan Remonido 5/21/99; pers. comm.).

Portuguese communities were usually small and very tight-knit. When an oven was built, it was commonly shared among the community and women would take turns baking on their scheduled days, which was usually two to three days a week. The task of gathering wood and lighting the fire belonged to the women and children. The oven became a focal point of the community. Women would gather to exchange stories and information, and childhood friendships were born as the children played together in the vicinity of the oven (Toni DeMello 6/4/99; pers. comm.).

Ovens were usually constructed out of cement and stone. The inner walls of the oven were lined with fire bricks to retain the heat. Even though all ovens were constructed and designed a little differently, depending on the builder, the *forno* had two basic shapes. One shape is referred to as a "beehive" or "igloo" shape and the other is a simple rectangle (Toni DeMello 6/4/99; pers. comm.).

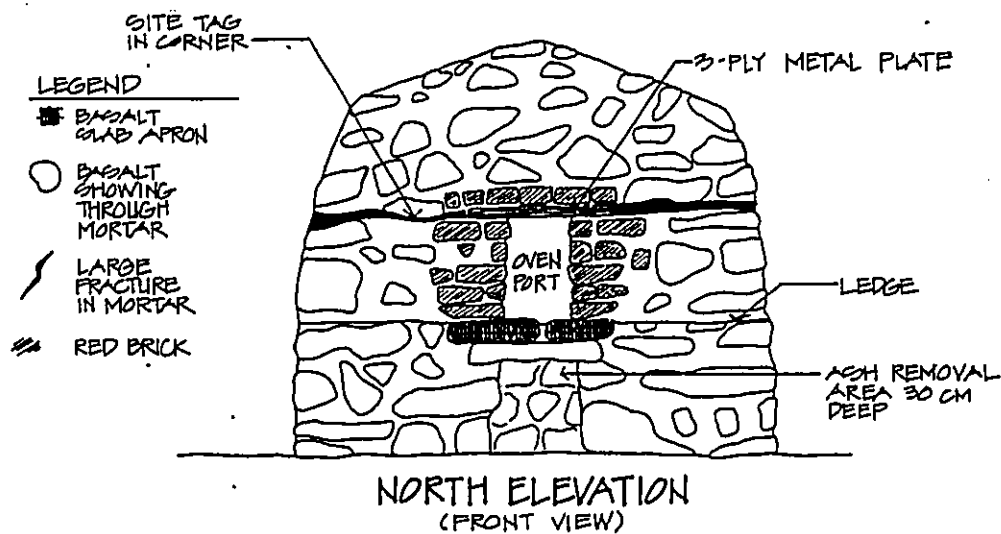


Figure 12 Profile drawing of Portuguese oven (State Site # 50-30-9-766)

State Site # 50-30-9-792

General Description: This site consists of a subsurface cultural layer that contains the remains of prehistoric habitation and other activities. The layer formed as a culturally modified A-horizon during prehistoric times. During Hawaiian occupation of the site, the A-horizon was enriched with material from cultural activities. The layer contains traditional-Hawaiian food remains, including mammal and fish bone and marine shell, charcoal from combustion features, and artifacts such as basalt flakes and volcanic glass. The site also contains numerous intrusive features that extend from the culture layer into the underlying, culturally sterile, beach sand. These features are the result of Hawaiian excavations for many purposes, including hearths, earth-ovens, and structural supports such as post holes. The site also contains what is most likely a prehistoric human burial.

Feature #: 50-30-9-792/A
Feature Type: Prehistoric Cultural Layer
Feature Function: Traditional Hawaiian Activity Area and Habitation Remains
Approx. Area: Discontinuous over approximately 8250 m² (88,756 sq. ft.)

Feature A is the cultural layer itself. It consists of a culturally enriched sand A horizon located in the western corner of the project area, see Figures 5 and 21 and Figures 66 to 69 in the Photographic Appendix 4. This feature was located and documented during the backhoe subsurface testing of the project area. Backhoe trenches 5, 6, 14, and 23 cut through this layer and exposed it in profile, see the backhoe testing results below. These four trenches exposed over 15 distinct intrusive features that extend from the cultural layer (generally stratum II) into the underlying culturally sterile sand deposits. This layer is generally 30-40 cm thick, but is up to 1.3 m thick at the largest and deepest intrusive features. The layer is discontinuous over an area measuring approximately 110 m (350 feet) by 75 m (250 feet).

The amounts of cultural material within this layer, the charcoal, basalt and volcanic glass flakes, and food midden remains, are not particularly large. The collected samples from the sampled features are catalogued in Appendix 5 and discussed in the backhoe trench descriptions below. The cultural layer is clearly visible in Trenches 5, 14, and 23. It is not visible in trenches 12 and 13 in this same immediate area. In Trench 6 the cultural layer is hardly apparent—but two earth-oven, or *imu*-type features were found within the side walls of this trench. Only in Trench 14 was the cultural layer one and the same with the current A Horizon. In all other trenches where Feature -792A was observed, the cultural layer was covered by what appears to be a fairly recent A horizon made up of sandy loam terrigenous sediments mixed with beach sand.

Based on the results of radiocarbon dating analysis of two charcoal samples from Trench 5, this prehistoric cultural layer dates to the pre-contact era, after the 14th century AD. See Appendix 6 for the discussion of radiocarbon dating results.

Feature #: 50-30-9-792/B
Feature Type: Human burial
Feature Function: Disposal of the dead
Approx. Area: one m²

This prehistoric/early historic Native Hawaiian burial is associated with the cultural layer 50-30-9-792/A. It was found in backhoe trench 23 in a large intrusive feature approximately 140 cmbs. This burial is described fully below in the Trench 23 description. It is common to find Native Hawaiian burials in sandy deposits along the coast. There is a good chance that additional, as yet undetected human burials are located in the vicinity.

VI. TESTING RESULTS

A. Hand Excavations

Following the pedestrian inspection of the project area, nine hand excavated test excavations were dug on April 29 and 30, 1999 by Kaiipo Akana, David Shideler, and Loren Zulick. Three test units were excavated in the rock platform (State Site # 50-30-9-763), and five shovel test pits were placed around its perimeter. The final test unit was put in at the shoreline on the west bank of Mahikona Stream.

Test Units 1,2,3, and Shovel Test Pits 1-5 were excavated at the platform (State Site # 50-30-9-763) in an attempt to determine function and date of this structure.

Test Unit 1 was placed at the southern end of the eastern paved depression on the surface of State Site # 50-30-9-763 (rock platform). This location was chosen to reveal a potentially high traffic area on the surface of the platform. This test unit was excavated in an effort to collect midden and/or artifacts for dating and functional interpretation. Test Unit 1 measured roughly 1.3m (4 ft.) by 1.5m (4.5 ft.). The width of the unit followed the feature dimensions and therefore was not uniform. The surface of Test Unit 1 was paved with cobbles and small boulders. The highest (SW) corner was at 2.3m (7.5 ft.) above ground surface. The unit was excavated by removing the cobbles and boulders and looking for artifacts and cultural deposits. Test Unit 1 was excavated to a maximum depth of 1.75m (5.5 ft.) below datum, or .75m (2.5 ft.) above ground surface. Bottom of excavation was 100% rock; there were large boulders that could not be removed. There was no soil at all within test unit 1. No cultural material was recovered (Figures 13 & 14).

Test Unit 2 was excavated on the eastern side of the surface ridge near its southern end. The piled rock construction technique of the ridge differed from placed paving technique of the surrounding surface of the platform. The purpose of Test Unit 2 was to determine if the surface ridge was constructed over a paved surface. A 1.6m (5 ft.) long by 1m (3 ft.) wide area near the southern end on the east side of the mounded ridge was chosen. The test unit extended from the apex of the ridge to the east out over the existing paved surface. The rocks from the sloping side of the ridge were removed to expose the surface upon which the ridge is constructed. It was determined that beneath the piled boulders of the ridge a relatively level surface of small subangular cobbles exists. From this observation it can be determined that the roughly piled boulder ridge postdates the paved surface of the platform. Taking this observation one step further, the mound, which was not tested, but is of similar construction technique and materials as the ridge, probably also has paving beneath it. These observations suggest that this structure utilizes various construction techniques and that construction occurred at different times. The base of excavation was 100% rock. Excavation ended when data recovered was sufficient to answer the questions posed. Test Unit 2 was not excavated below the paved surface of the platform. There was no soil at all within Test Unit 2. No cultural material was recovered (Figures 15 & 16).

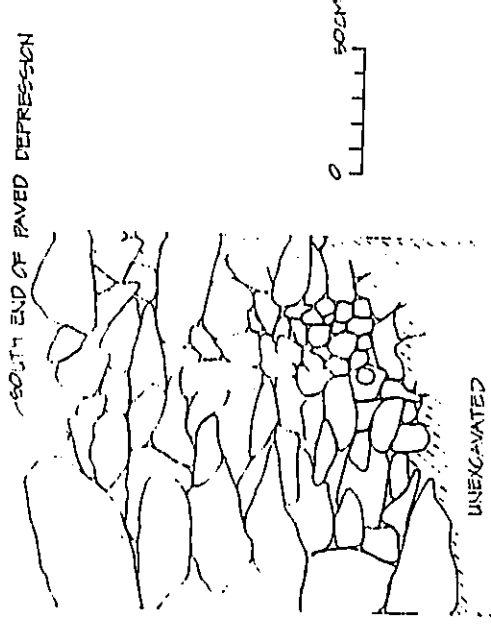


Figure 13 Test Unit 1 profile drawing of south wall



Figure 14 Test Unit 1 post excavation photo view to south

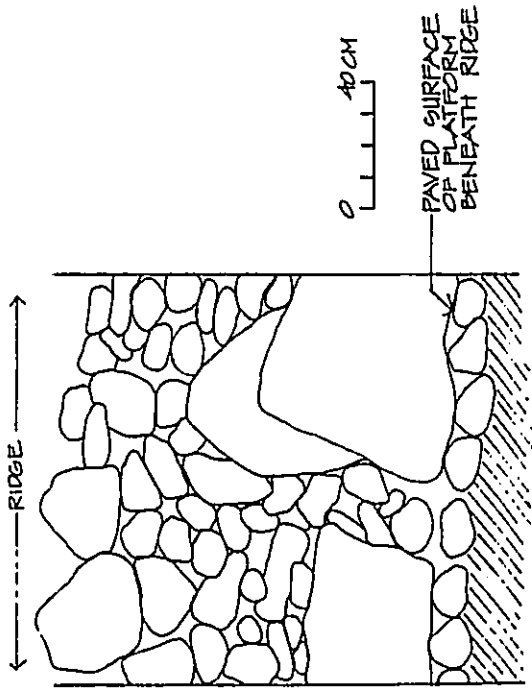


Figure 15 Test Unit 2 profile drawing of mounded ridge



Figure 16 Test Unit 2 post excavation photo of mounded ridge

Test Unit 3 was placed at the northern end of the eastern paved depression. Test Unit 3 measured 1.2m (4 ft.) square. Its location, at the end of a paved depression and by a gently sloping side (possible ramp), was chosen as a likely spot for cultural deposits, as this may have been an access area for the platform. This unit was excavated by removing basalt cobbles and boulders to a maximum depth of 1.25m (4 ft.) below the surface of the platform. Bottom of excavation was 100% rock. There was no soil within Test Unit 3. There were no cultural materials within the test unit (Figures 17 & 18).

The three test units did not yield any cultural material at all. No soil was excavated in any of the three test units. What the test units did reveal was that the surface of the platform had been entirely paved in its initial construction. Two of the surface features utilized a piling construction technique that distinguished them from the paved surface of the platform. The surface ridge, and theoretically the mound (it was not tested), were built at a later date than the surface of the platform.

No soil was excavated directly beneath the platform so the soil around the perimeter of Slate Site # 50-30-9-763 was tested to search for the presence of cultural material that might be helpful in determining the age and/or function of the platform (see Figure 9 above).

Shovel Test Pit #1 was 2.4m (7.5 ft.) west of the platform in the soil between the platform and the project boundary wall. This test pit measured .50m (1.5 ft.) by .55m (1.5 ft.) and .30m (1 ft.) deep. Stratum 1 was an organic layer of *kiawe*, *hale koa*, and grass detritus measuring 0-.04m (0-2 in.) below surface. Stratum 1 was a 10YR 4/4 dark yellowish brown silt loam. This silt loam is described as having a lower boundary of *as* (abrupt, smooth), its structure is *ov/gr* (structure less, very fine, granular). The consistence of the soil is: *dlo* (dry-loose, noncoherent), *mfr* (moist-firm), *wss* (wet-slightly sticky). Stratum 1 plasticity is described as *ups* (slightly plastic). The root description is *lmi hor ex* (few micro roots spreading out horizontally along ped faces).

Stratum 2 was a 10YR 5/8 yellowish brown silt loam that measured from .04-.30m (2-12 in.) below the surface. The lower boundary of Stratum 2 was not observed. The structure of this silt loam is *lfr* (weak, fine, crumb). The consistence of the soil is: *dsh* (dry-slightly hard), *mfr* (moist friable), *wss* (wet-slightly sticky). Stratum 2 plasticity is *wp* (plastic). The root description is *vm hor ex* (very few medium roots spreading out horizontally along ped faces).

Bottom of excavation was at .30m (1 ft.) below surface with 50% subangular basalt possibly bedrock and 50% stratum 2. No midden or artifacts were observed.

Shovel Test Pit #2 was 5m (16 ft.) west of the southwest corner of the platform. This test pit measured .50m² (1.5 ft.) and .25m (10 in.) deep. Stratum 1 was an organic layer of *kiawe*, *hale koa*, and grass detritus measuring 0-.11m (0-4 in.) below surface. Stratum 1 was a 10YR 4/4 dark yellowish brown silt loam. This silt loam is described as having a *w* (wavy) lower boundary whose structure is *ov/gr* (structure less, very fine, granular).

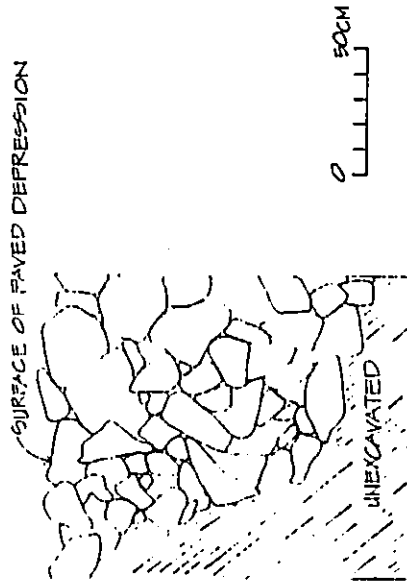


Figure 17 Test Unit 3 profile drawing of west wall

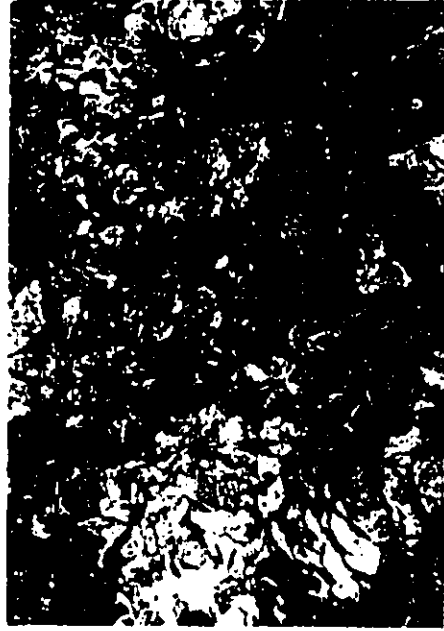


Figure 18 Test Unit 3 post excavation photo of west wall

The consistence of the soil is: *dlo* (dry-loose, noncoherent), *mfi* (moist-firm), *wss* (wet-slightly sticky). Stratum 1 plasticity is described as *wps* (slightly plastic). The root description is *lmi hor ex* (few micro roots spreading out horizontally along ped faces).

Stratum 2 was a 10YR 4/4 dark yellowish brown silt loam that measured from .11-.25m (4-10 in.) below the surface. The lower boundary of Stratum 2 was not observed. The structure of this silt loam is *lfr* (weak, fine, crumb). The consistence of the soil is: *dsh* (dry-slightly hard), *mfr* (moist-friable), *wss* (wet-slightly sticky). Stratum 2 plasticity is *wp* (plastic). The root description is *v,m hor ex* (very few medium roots spreading out horizontally along ped faces).

Bottom of excavation was at .25m (10 in.) below surface with 50% subangular basalt possibly bedrock and 50% stratum 2. No midden or artifacts were observed.

Shovel Test Pit #3 was 6m (19 ft.) south of the southern end of the platform. This test pit measured .50m (1.5 ft.) by .55m (1.5 ft.) and .35m (14 in.) deep. Stratum 1 was an organic layer of *kitae*, *hale koo*, and grass detritus measuring 0-.06m (0-3 in.) below surface. Stratum 1 was a 10YR 4/4 dark yellowish brown silt loam. The lower boundary of this silt loam is as (abrupt, smooth), its structure is *ovfgr* (structureless, very fine, granular). The consistence of the soil is: *dlo* (dry-loose, noncoherent), *mfi* (moist-firm), *wss* (wet-slightly sticky). Stratum 1 plasticity is described as *wps* (slightly plastic). The root description is *lmi hor ex* (few micro roots spreading out horizontally along ped faces).

Stratum 2 was a 10YR 5/8 yellowish brown silt loam that measured from .06-.35m (3-14 in.) below the surface. The lower boundary of stratum 2 was not observed. The structure of this silt loam is *lfr* (weak, fine, crumb). The consistence of the soil is: *dsh* (dry-slightly hard), *mfr* (moist-friable), *wss* (wet-slightly sticky). Stratum 2 plasticity is *wp* (plastic). The root description is *v,m hor ex* (very few medium roots spreading out horizontally along ped faces). Bottom of excavation was at .35m (14 in.) below surface with 80% subangular basalt possibly bedrock and 20% stratum 2. No midden or artifacts were recovered.

Shovel Test Pit #4 was 6m (19 ft.) east of the eastern side of the platform. This test pit measured .45m² (18 in.) and .40m (16 in.) deep. Stratum 1 was an organic layer of *kitae*, *hale koo*, and grass detritus measuring 0-.03m (0-1 in.) below surface. Stratum 1 was a 10YR 4/4 dark yellowish brown silt loam. This silt loam is described as having a lower boundary of as (abrupt, smooth), its structure is *ovfgr* (structure less, very fine, granular). The consistence of the soil is: *dlo* (dry-loose, noncoherent), *mfi* (moist-firm), *wss* (wet-slightly sticky). Stratum 1 plasticity is described as *wps* (slightly plastic). The root description is *lmi hor ex* (few micro roots spreading out horizontally along ped faces).

Stratum 2 was a 10YR 4/4 dark yellowish brown silt loam that measured from .03-.40m (1-16 in.) below the surface. The lower boundary of stratum 2 was not observed. The structure of this silt loam is *3cpr* (strong, coarse, columnar). The consistence of the soil is: *dsh* (dry-slightly hard), *mfr* (moist-friable), *wss* (wet-slightly sticky). Stratum 2 plasticity

is *wp* (plastic). The root description is *v,m hor ex* (very few medium roots spreading out horizontally along ped faces).

Bottom of excavation was at .40m (16 in.) below surface with 100% very hard stratum 2 that could not be dug any deeper by shovel.

Shovel Test Pit #5 was 7.5m (24 ft.) east of the northern end of the platform. This test pit measured .50m³ (1.5 ft.) and .35m (14 in.) deep. Stratum 1 was an organic layer of *kiawe, hale koa*, and grass detritus measuring 0-.04m (0-2 in.) below surface. Stratum 1 was a 10YR 4/4 dark yellowish brown silt loam. This silt loam is described as having a lower boundary of *as* (abrupt, smooth), its structure is *ov/gr* (structure less, very fine, granular). The consistence of the soil is: *dlo* (dry-loose, noncoherent), *mfi* (moist-firm), *uss* (wet-slightly sticky). Stratum 1 plasticity is described as *wps* (slightly plastic). The root description is *lmi hor ex* (few micro roots spreading out horizontally along ped faces).

Stratum 2 was a 10YR 4/4 dark yellowish brown st sil (stone silt loam) that measured from .04-.35m (2-14 in.) below the surface. The lower boundary of stratum 2 was not observed. The structure of this silt loam is *3ccpr* (strong, coarse, columnar). The consistence of the soil is: *dsh* (dry-slightly hard), *mfr* (moist-friable), *uss* (wet-slightly sticky). Stratum 2 plasticity is *wp* (plastic). The root description is *v,m hor ex* (very few medium roots spreading out horizontally along ped faces). Bottom of excavation was at .35m (14 in.) below surface with 60% subangular basalt and 40% stratum 2.

The shovel test pits helped to determine the rocky nature of the soil surrounding State Site #50-30-9-763. This fact raises confidence that the platform was constructed over a natural outcropping. The soil surrounding the platform had cobbles and boulders above and below the surface. There were small bedrock outcrops observed on the surface as well. It was observed that the most available and closest loose cobbles and boulders on the pasture lands surrounding the platform were not utilized in the construction of the platform.

Test Unit 4 was excavated on the level sandy ground behind the beach where the Mahikona Stream flows into the ocean (Figures 19 & 20). More specifically, the test unit was 6m (19 ft.) west of the western bank of Mahikona Stream, and 4m (13 ft.) north (*mauka*) of the beginning of the vegetation along the shoreline. The test unit location was chosen as a likely spot for pre-contact occupation because of its proximity to the ocean and perennial stream. Test Unit 4 measured 1m³ (3 ft.³) and was excavated in beach sand to a maximum depth of 1.3m (4 ft.) below surface.

Stratum 1 was a 10YR 6/4 light yellowish brown sterile beach sand that extended from 0m below surface (bs) to .68m (2 ft.). This sand had an *as* (abrupt, smooth) lower boundary whose structure is defined as: *0v/gr* (structureless, very fine, granular). The consistence of the sand in stratum 1 is: *dlo* (dry-loose, noncoherent), *mlo* (moist-loose noncoherent), *uso* (wet-nonsticky). The sand is *wpo* (nonplastic). The roots within stratum 1 are *l&m hor ex* (few fine and medium roots spreading out horizontally along ped faces).

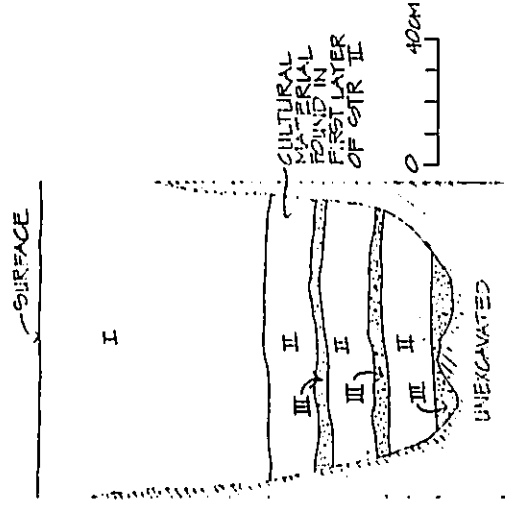


Figure 19 Test Unit 4 profile drawing of north wall



Figure 20 Test Unit 4 post excavation photo of north wall

Stratum 2 was a 10YR 4/4 dark yellowish brown sandy clay that extended from .68mbs (2 ft.) to .84mbs (2.5 ft.). This stratum had a *vas* (very abrupt, smooth) lower boundary. This sandy clay had a structure defined as: *2ccr* (moderate, coarse, crumb). Its consistence is: *dsh* (dry-slightly hard), *muf* (moist-very firm), *wss* (wet-slightly sticky). This sandy clay is *wpo* (nonplastic). The roots within stratum 2 are *v,uf,hor ex* (very few very fine roots spreading out horizontally along ped faces). There were historic metal pieces within this stratum.

Stratum 3 was a 10YR 3/4 dark yellowish brown clay extending from .84mbs (2.5 ft.) to .90mbs (3 ft.). This stratum had a *vas* (very abrupt, smooth) lower boundary. The structure of this clay is defined as: *3cabk* (strong, coarse, angular blocky). Its consistence is: *dh* (dry-hard), *mfi* (moist-firm), *wss* (wet-slightly sticky). This clay is *wp* (plastic). The roots within stratum 3 are *v,uf,hor ex* (very few very fine roots spreading out horizontally along ped faces). This stratum was sterile.

Stratum 4 was identical to stratum 2 except that it had no cultural materials within the layer. Stratum 4 was a 10YR 4/4 dark yellowish brown sandy clay that extended from .90mbs (3 ft.) to 1.02mbs (3 ft.). This stratum had a *vas* (very abrupt, smooth) lower boundary. This sandy clay had a structure defined as: *2ccr* (moderate, coarse, crumb). Its consistence is: *dsh* (dry-slightly hard), *muf* (moist-very firm), *wss* (wet-slightly sticky). This sandy clay is *wpo* (nonplastic). The roots within stratum 4 are *v,uf,hor ex* (very few very fine roots spreading out horizontally along ped faces).

Stratum 5 was identical to stratum 3. Stratum 5 was a 10YR 3/4 dark yellowish brown clay extending from 1.02mbs (3 ft.) to 1.08mbs (3.5 ft.). This stratum had a *vas* (very abrupt, smooth) lower boundary. The structure of this clay is defined as: *3cabk* (strong, coarse, angular blocky). Its consistence is: *dh* (dry-hard), *mfi* (moist-firm), *wss* (wet-slightly sticky). This clay is *wp* (plastic). The roots within stratum 5 are *v,uf,hor ex* (very few very fine roots spreading out horizontally along ped faces). This stratum was sterile.

Stratum 6 was identical to strata 2 and 4. Stratum 6 was a 10YR 4/4 dark yellowish brown sandy clay that extended from 1.08mbs (3.5 ft.) to 1.22mbs (4 ft.). This stratum had a *vas* (very abrupt, smooth) lower boundary. This sandy clay had a structure defined as: *2ccr* (moderate, coarse, crumb). Its consistence is: *dsh* (dry-slightly hard), *muf* (moist-very firm), *wss* (wet-slightly sticky). This sandy clay is *wpo* (nonplastic). The roots within stratum 6 are *v,uf,hor ex* (very few very fine roots spreading out horizontally along ped faces). Stratum 6 was sterile.

Stratum 7 was identical to strata 3 and 5. Stratum 7 was a 10YR 3/4 dark yellowish brown clay extending from 1.22mbs (4 ft.) to 1.30mbs (4 ft.). This stratum had a *vas* (very abrupt, smooth) lower boundary. The structure of this clay is defined as: *3cabk* (strong, coarse, angular blocky). Its consistence is: *dh* (dry-hard), *mfi* (moist-firm), *wss* (wet-slightly sticky). This clay is *wp* (plastic). The roots within stratum 7 are *v,uf,hor ex* (very few very fine roots spreading out horizontally along ped faces). This stratum was sterile.

In addition to Test Unit 4, the west bank of Mahikona Stream where it cuts through the beach was examined. In an effort to expose a cultural layer, an area 1.5m (5 ft.) wide and 1.5m (5 ft.) high was excavated on the bank with a shovel. Some driftwood and large boulders (used to reinforce the bank) were the only items observed.

Neither Test Unit 4 nor the shovel exploration of the bank of Mahikona Stream yielded any evidence to support pre-contact occupation at this location.

B. Coring and Dating at Kekupua Pond

In coordination with the present archaeological research, coring studies were conducted at Kekupua Pond on the subject property by David A. Burney of Fordham University and William (Pila) K. Kikuchi of Kaua'i Community College. Their study, "Preliminary Investigations at Kekupua Pond, Makuaweli, Kaua'i" is included in its entirety as Appendix 3. Carbon dating results were not available at the time of this study. Pollen analysis is still on-going. The results of coring and dating available to date are briefly summarized below.

Probing indicated that only the central portion of the pond has > 1 m of soft sediment and is suitable for coring studies. One 220 cm long core was recovered. Seven layers of sediments were described. Burney and Kikuchi tentatively suggest a pond history beginning with a shallow, natural basin subject to marine overwash, followed by modification by prehistoric Hawaiians to minimize marine influence, which was followed by a swamp-forest stage with periods of increased erosion into the pond concluded by a last phase of organic sedimentation reflecting recent overgrowth of the pond by aquatic vegetation.

A "key" or drupe from a *hala* (*Pandanus tectorius*) fruit was recovered from a core depth of approximately 170 cm at a zone of contact between silty peat and a basal silty sand layer of probable marine origin. This drupe sample was "submitted for C14 dating in order to establish a maximum age for the pond." (Burney and Kikuchi 1999). The dating results are presented below.

Beta Analytic #	Sample Size	Depth	Measured C14 Range	C13/C12 Ratio	Conventional C14 Age
132384	2.2 g (0.5 g carbon)	170 cm bs	980 +/- 80 BP	-25.6 o/oo	980 +/- 80

The Beta Analytic, Inc. print outs are included in Appendix 6.

The two sigma calibrated range (95 % probability) is AD 895 to 1225. Because *Pandanus* is indigenous to Kaua'i there is some uncertainty regarding what this date represents but if Burney and Kikuchi are correct then the maximum age for the pond would be AD 895 to 1225. This would seem to thus correspond to the time of initial modification of the natural basin by prehistoric Hawaiians to minimize marine influence or effectively to the creation

of Kekupua Fishpond. Kikuchi (1973:181-186) hypothesized that the innovation of fishponds was earlier than AD 1200. A study at Nu'upia Fishpond at Mōkapu, O'ahu (Hammatt *et al.* 1985) dated the initial use of the ocean as a fishpond circa AD 1048 +/- 95 years. Kikuchi's (1992:58) dating of Kamo'omaka'i Fishpond at Hanalei, Kaua'i estimated the origin of the pond as circa AD 1250. Thus the date range for the posited origin of Kekupua Fishpond is somewhat early but quite consistent with previous dating studies on Hawaiian fishponds.

The Kekupua Fishpond date is consistent with other carbon dating from Kaua'i which suggests a substantial expansion of human settlement in the latter portion of the posited Kaua'i Island "Developmental Period" from AD 600 to 1400 (Hammatt *et al.* 1998: 130ff). The time frame from AD 1150 to 1400 seems to have been a time of pronounced population increase, settlement and agricultural/aquacultural expansion on Kaua'i.

C. Backhoe Trenches

1. Introduction

In response to comments on an earlier draft of this inventory survey report, Cultural Surveys Hawai'i conducted three days of sub-surface testing within the proposed Kapalawai project area, from January 20-22, 2000. The field crew consisted of Matt McDermott and Ka'ohulani Mc Guire. Kūka'ia Construction Company provided the backhoe and operator.

A total of 23 backhoe trenches were excavated and documented. The following trench descriptions and their accompanying profiles are presented and discussed by geographic region rather than in order by trench number. Trench locations are shown on Figure 21. Select photographs of trench profiles are included in the Photographic Appendix 4. As can be seen from the trench distribution in Figure 21, the backhoe subsurface testing focused on the sand deposits along the coast and on the terrigenous sediments around Kekupua Fishpond. The terrigenous sediments in the *mauka* portion of the project area were not tested with the backhoe. Based on observations made during the pedestrian inspection of the project area, it was unlikely that these *mauka* terrigenous sediments contained buried cultural deposits.

For the sake of discussion the tested areas of the project area were divided into four geographic regions. The southeastern-most region consists of the *makai* portion of Kekupua Valley between A'akui and Mahikona Streams. Trenches 1, 2, 3, 4, 15, 16, 17, and 18 were excavated in these entirely sandy beach deposits.

The next geographic region to the northwest consists of the area around the *makai* half of Kekupua Fishpond. Trenches 19, 20, 9, 10, and 11 were excavated in these almost entirely terrigenous sediments. A cross-section was prepared at the location of Trench 10 showing the relationship of the trench stratigraphy, including uncovered bedrock, to the water level in Kekupua Fishpond.

To the west of Kekupua Fishpond, directly *makai* of the Robinson Family home (Site 50-30-09-764), Trenches 7, 8, 21, and 22 document the sandy beach stratigraphy of this portion of the project area.

The last concentration of backhoe trenches is located at the west corner of the project area amid predominantly sandy deposits. Trenches 5, 6, 12, 13, 14, and 23 were excavated to document the stratigraphy there.

2. General Discussion of Stratigraphy

Because the majority of trenches were excavated in sandy coastal deposits, sand is the most common stratigraphic component. The majority of trenches consisted simply of a grey-brown, organically enriched sand A-horizon over undisturbed beach sand deposits. The grey-brown sand A-horizon contains abundant roots and rootlets. In some portions of

the project area it is enriched with charcoal, artifacts, midden, and numerous pit-features which extended into the underlying cultural sterile sand. In the underlying pure calcareous sand it is common to have significant amounts of water rounded shell and coral pebbles. There are also thin, horizontal bands of semi-cemented coarser grained shell and coral within the sand deposits. These bands are the result of periodic higher energy deposition from storm surge or high surf. At the base of several trenches cemented beach-rock was encountered.

A variable component to this basic beach sand stratigraphy included a medium brown, sandy loam. This generally thin (15-30 cm thick) layer is usually found at the surface, generally immediately above the grey-brown sand former A-horizon (discussed above). The sandy loam has weak structure and generally poor development as an A-horizon, suggesting fairly recent deposition. This sandy loam is discontinuous and unevenly distributed over the landscape. It is a mix of the local beach sand with terrigenous loam from the mauka portion of the project area. This sediment is most likely associated with historic or modern land modifications. Where this sediment is found it does not appear to have disturbed the older sand A-horizon when it was deposited.

The excavations around Kekupua Fishpond revealed almost exclusively terrigenous sediments. These silty-clay-loams, clay loams, and clays are the result of alluvial deposition. Closer to the coastline these sediments are either buried by or bury calcareous sand deposits. Except for a single historic cultural layer associated with the mechanized earth moving along the north side of Kekupua Fishpond, documented in Trench 10, no cultural deposits or features were found in terrigenous sediments.

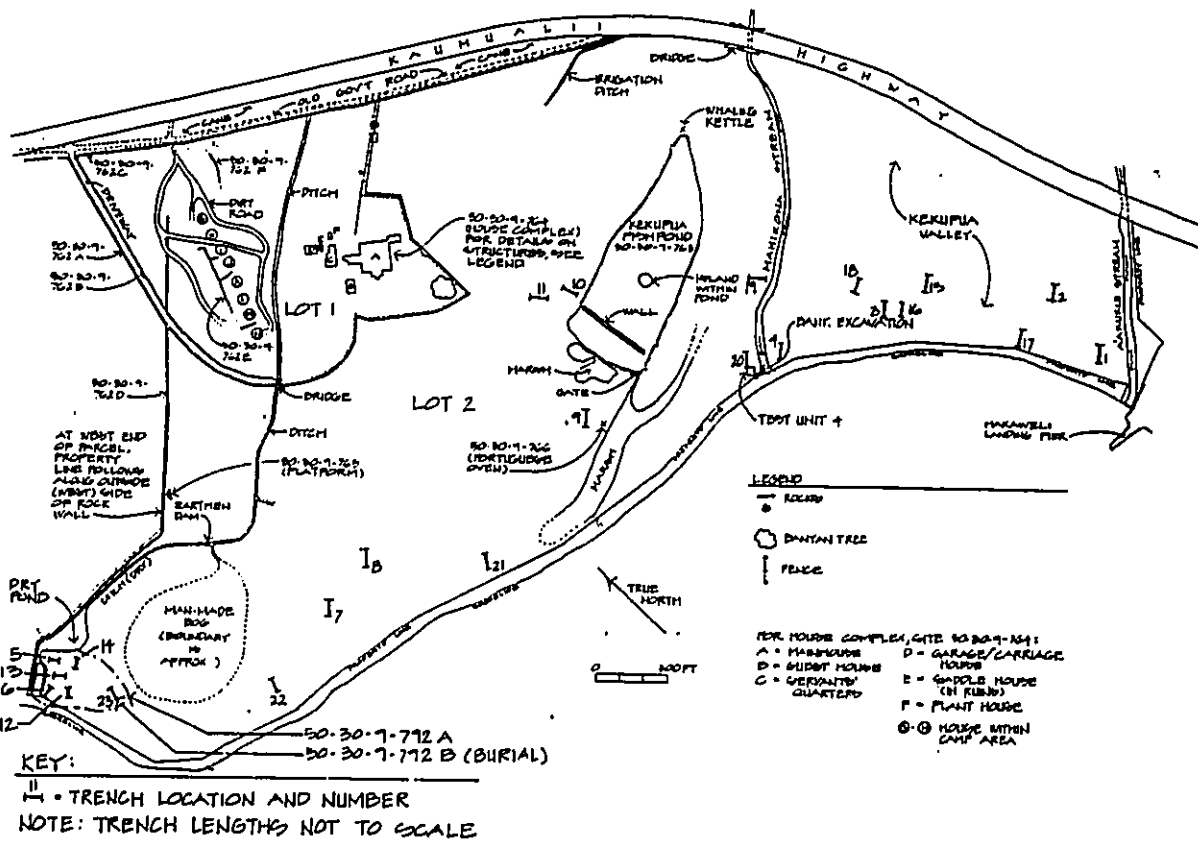


Figure 21 Locations of Backhoe Trenches Excavated Within the Project Area

3. Trench Descriptions by Geographic Region
(From southeast to west across the project area)

Trench BT#1: Orientation: 70/250° TN; Length 5.4 m.; Width: .75 m.; Depth: 2.2 m.;
Water table @ 205 cmbs*; Profile: South Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-30	7.5YR 4/3-4/4 brown, loose, structureless, medium to fine sand. Organically enriched A-horizon. Contains abundant roots and rootlets. Lower boundary clear/wavy.
Stratum IIa	31-85	10YR 6/4 light yellowish brown, slightly compact, structureless, medium to fine sand. Contains a few roots and rootlets, and a few coral cobbles. Lower boundary clear/wavy.
Stratum IIb	86-205	10YR 6/4 light yellowish brown, slightly compact, structureless, medium to coarse sand. Contains a few roots and rootlets, and a few coral cobbles. Lower boundary abrupt/wavy.
Stratum III	206-BOE**	Gley N7/ light grey, wet (found only below water table @ 205 cmbs), loose, structureless, medium sand. Contains a few coral cobbles.

*centimeters below surface

**Base of Excavation

This trench contains no cultural deposits and all calcareous sand sediments.

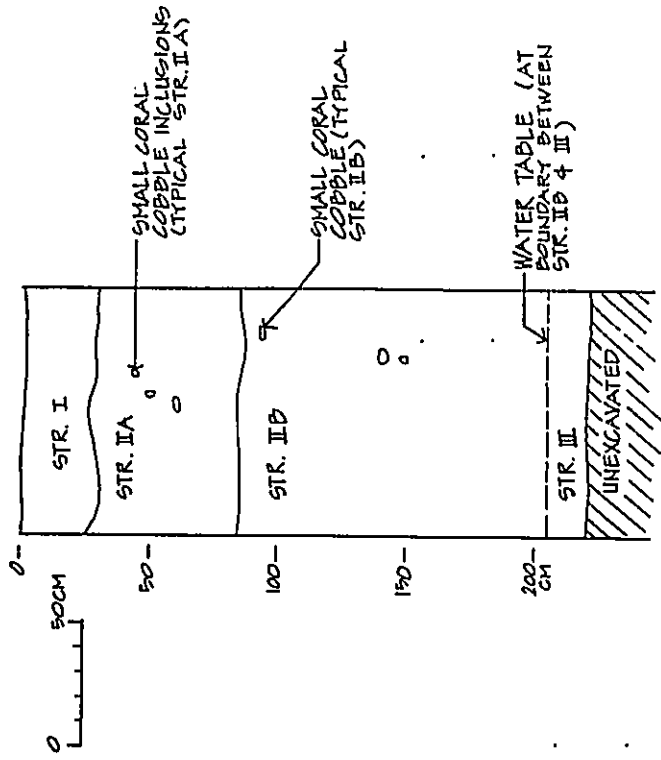


Figure 22 Backhoe Trench #1, Representative South Profile

Trench BT#2: Orientation: 45/225° TN; Length 7.2 m; Width: .75 m; Depth: 2.1 m;
 Watertable at 200 cmbs; Profile: North Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-29	10YR 4/3 brown, slightly compact, with weak medium granular structure, sandy loam. Contains terrigenous sediment and medium beach sand and abundant roots & rootlets. A horizon. Lower boundary clear/wavy.
Stratum IIa	30-95	10YR 6/4 light yellowish brown, slightly compact, structureless, medium to fine sand. Contains a few roots and rootlets, and a few coral cobbles. Lower boundary clear/wavy.
Stratum IIb	96-BOE	10YR 6/4 light yellowish brown, slightly compact, structureless, medium to coarse sand. Contains a few roots and rootlets, and a few coral cobbles. Lower boundary abrupt/wavy.

Note: No gleyed Str III in this trench as in trench 1, although watertable at 2 m below surface.

Stratum I in this trench is the sandy loam, poorly developed A-horizon that appears to be a recently deposited. The rest of the sediments are purely calcareous sand.

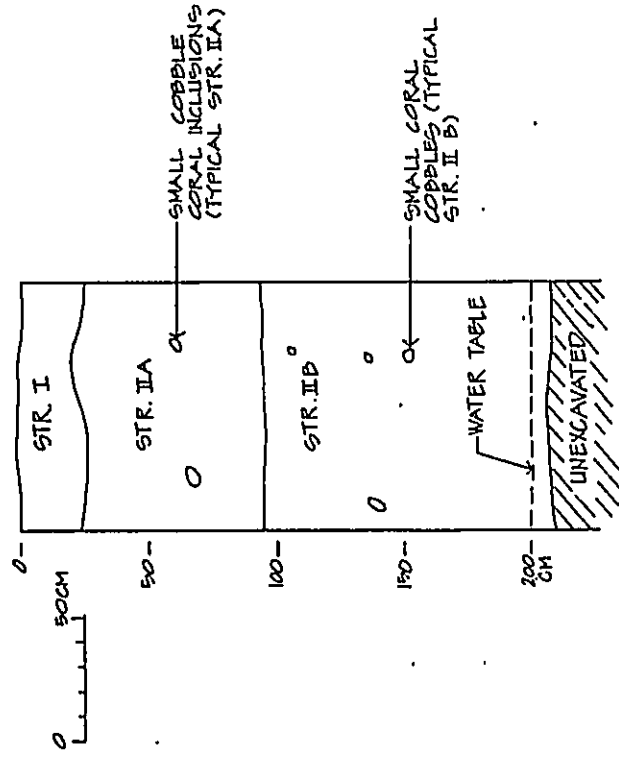
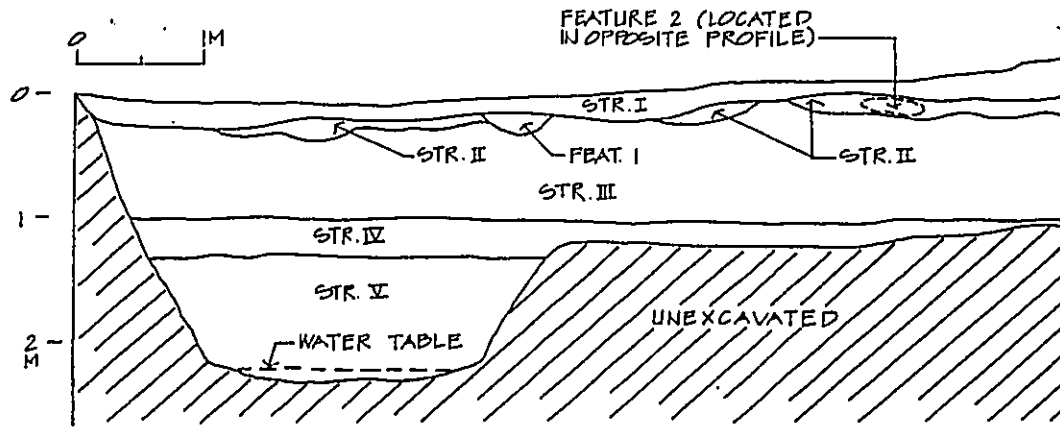


Figure 23 Backhoe Trench #2, Representative North Profile

Figure 24 Backhoe Trench #3, Northwest Profile



Trench BT#3: Orientation: 40/220° TN; Length 7.6 m; Width: .75 m; Depth: 2.3 m; Water table at 215 cmbs; Profile: Southeast Face, See Figure 86 in Appendix 4.

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-30	10YR 4/3 brown, slightly compact, with weak medium granular structure, sandy loam. Contains equal parts terrigenous sediment and medium beach sand and abundant roots & rootlets. A horizon. Lower boundary clear/wavy.
Stratum II	10-30	10YR 4/3 brown, slightly compact, structureless fine to medium sand. Somewhat mottled with the underlying III (beach sand); contains a few roots and rootlets, and a few small flecks of charcoal. There are 2 small areas of black/ash stained sand--Features 1 and 2 in the profile. Feature 2 is on the opposite (northwest) side wall, see feature discussion below. Str. II contains shell fragments and coral pebbles, naturally part of the deposit. Lower boundary abrupt/wavy. Str. II is a discontinuous older A-horizon buried, probably fairly recently, by Str. I.
Stratum III	20-120	10YR 6/4 light yellowish brown, loose, structureless, fine to medium sand. Contains very few roots or rootlets, no culture. Lower boundary abrupt/wavy.
Stratum IV	100-130	10YR 6/4 light yellowish brown, very compact, structureless, coarse to very coarse sand. Contains abundant coral and shell pebbles--a higher energy deposit that has become semi-cemented. No culture. Lower boundary abrupt/smooth.
Stratum V	125-BOE	10YR 6/4 pale brown, loose to slightly compact, coarse and very coarse sand. Some coral pebble structures, no culture, no roots. Water table at 215 cmbs.

Features 1 & 2 - 3 gallons from each feature were screened through 1/8" mesh screen. Only the material from Feature 1 was collected. Both features contained similar amounts of charcoal and marine shell. The 3-gallon sample from Feature 1 contained 6 g of charcoal,

1.3 g of unidentifiable small fragments of mammal bone, and 5.3 g of marine and brackish/fresh water shell, see Figure 86 in Appendix 4. The marine shell consisted of Echinoderm, *Brachidontes* sp., *Turbo sandwicensis*, *Terebra* sp., and unidentifiable shell fragments. The fresh/brackish water shell consist of a single fragment of *Theodoxus* sp. The marine invertebrate shell from the features is water-rounded and indistinguishable in abundance, appearance, and species present from the shell collected from 3 gallons of screened Stratum III (natural beach deposit). Even the *Theodoxus* shell fragment is less of a cultural indicator because of the two freshwater streams in close proximity to Trench 3. However, the charcoal and mammal bone fragments indicate the two features are cultural. No historic or traditional-Hawaiian artifacts were found in the feature fill.

Features 1 and 2, within the discontinuous stratum II are remnants of cultural activity. Trenches 16 and 18 were excavated on either side of Trench 3 to determine if this discontinuous cultural deposit extended horizontally. Based on the stratigraphy of Trenches 16 and 18 the deposit does not continue horizontally. It is more likely that Features 1 and 2 are not prehistoric features. This determination was made based on the available evidence, including the comparison of the features' contents and form with the features of the clearly prehistoric cultural layer documented in the west corner of the project area (Site 50-30-09-792/A). These features are thought to be the remains of historic hearth-type features associated with the older, recently buried A-horizon, stratum II. No State site number was assigned this ephemeral, apparently historic cultural deposit.

Trench BT#4: Orientation: 25/205° TN; Length 6.3 m; Width: 1.5 m; Depth: 1.8 m; Profile: North Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-25	10YR 4/3 brown, slightly compact, with weak medium granular structure, sandy loam. Contains equal parts terrigenous sediment and medium beach sand and abundant roots & rootlets. A horizon. Lower boundary clear/wavy.
Stratum II	26-40	10YR 4/3 brown, slightly compact, structureless fine to medium sand. Somewhat mottled with the underlying III (beach sand); contains a few roots and rootlets, Str. II contains shell fragments and coral pebbles, naturally part of the deposit. Lower boundary abrupt/wavy. Str. II is an older A-horizon buried, probably fairly recently, by Str. I.
Stratum IIIa	41-15	10YR 6/4 light yellowish brown, loose, structureless, fine to medium sand. Contains very few roots or rootlets and no culture. Lower boundary abrupt/wavy.
Stratum IIIb	see profile	10YR 6/4 light yellowish brown, very compact, coarse to very coarse sand, semi-cemented, contains water-rounded shell & coral pebbles, high energy deposit, no culture. Lower boundary abrupt/smooth.
Stratum IV	156-BOE	10YR 6/2 light brownish grey, loose to slightly compact, structureless, coarse to very coarse sand. Some coral pebble inclusions, no culture, no roots.

Trench BT#16: Orientation: 50/230° TN; Length 6.2 m; Width: 0.85 m; Depth: 1.5 m;
 Profile: Southeast Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-42	10YR 4/3 brown, loose, structureless, medium sand. Typical sand A-horizon. Contains abundant roots and rootlets and some coral and shell pebble inclusions. No culture. Lower boundary clear/wavy.
Stratum II	40-BOE	10YR 6/4 light yellowish brown, loose to compact (with greater depth), structureless, medium to coarse sand. Contains several horizontal bands of coarse grained sand, shell and coral pebbles and small cobbles (higher energy deposit - 3-5 cm thick--semi-cemented). No culture. Few roots or rootlets. Str. II becomes more compact with greater depth, it eventually becomes semi-cemented.

The sandy loam is not present in this trench--all calcareous sand.

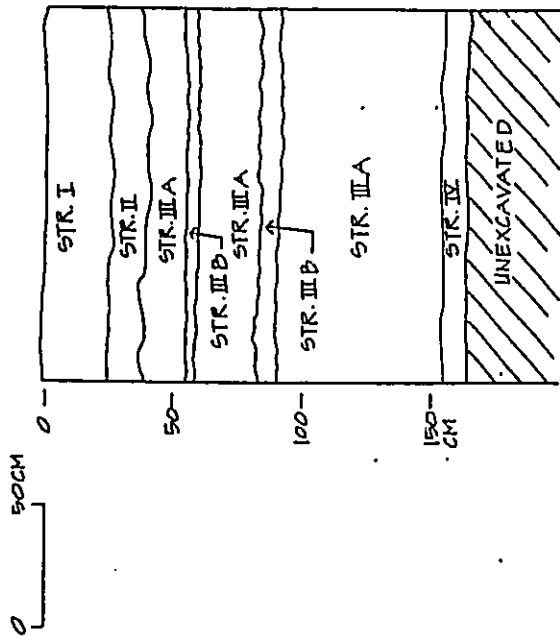
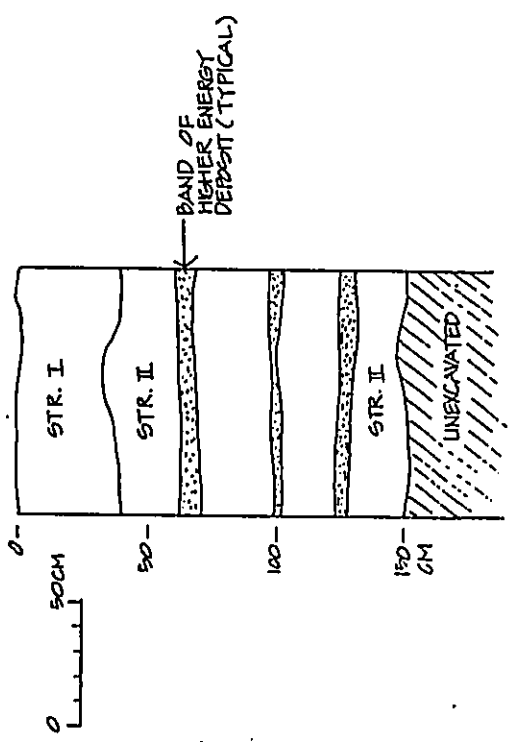


Figure 25 Backhoe Trench #4, Representative North Profile



Trench BT#16: Orientation: 40/220° TN; Length 12.2 m; Width: 0.8 m; Depth: 2.05 m (as deep as was possible because of cave in); Profile: West/Northwest Face

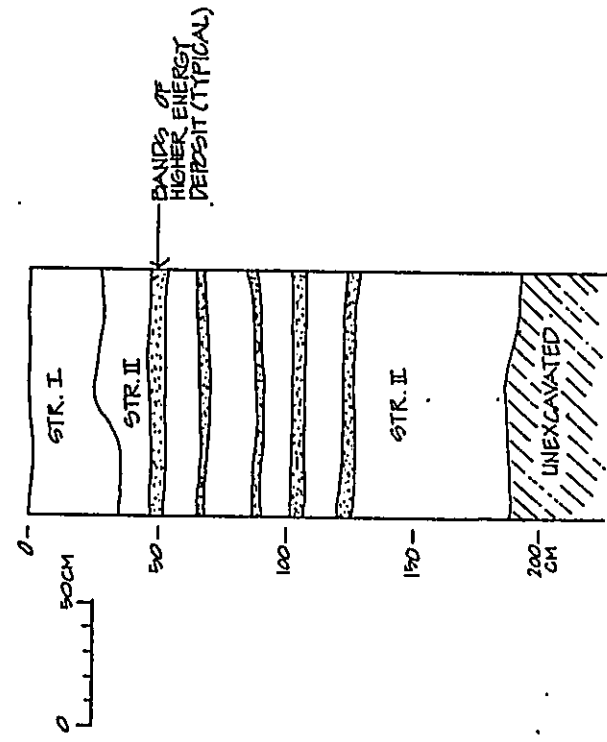
Profile Description

Strata	Depth (cm)	Description
Stratum I	0-35	10YR 4/3 brown, loose, structureless, medium sand. Typical sand A-horizon. Contains abundant roots and rootlets and some coral and shell pebble inclusions. No culture. Lower boundary clear/wavy.
Stratum II	25-BOE	10YR 6/4 light yellowish brown, loose to compact (with greater depth), structureless, medium to coarse sand. Contains several horizontal bands of coarse grained sand, shell and coral pebbles and small cobbles (higher energy deposit - 3-5 cm thick-semi-cemented). No culture. Few roots or rootlets. Str. II becomes more compact with greater depth, it eventually becomes semi-cemented.

The sandy loam is not present in this trench—all calcareous sand.

Figure 26 Backhoe Trench #15, Representative Southeast Profile

Trench BT#17: Orientation: 48/228° TN; Length 7.5 m; Width: 1.10 m; (cave in) Depth: 1.65 m; Profile: North Face



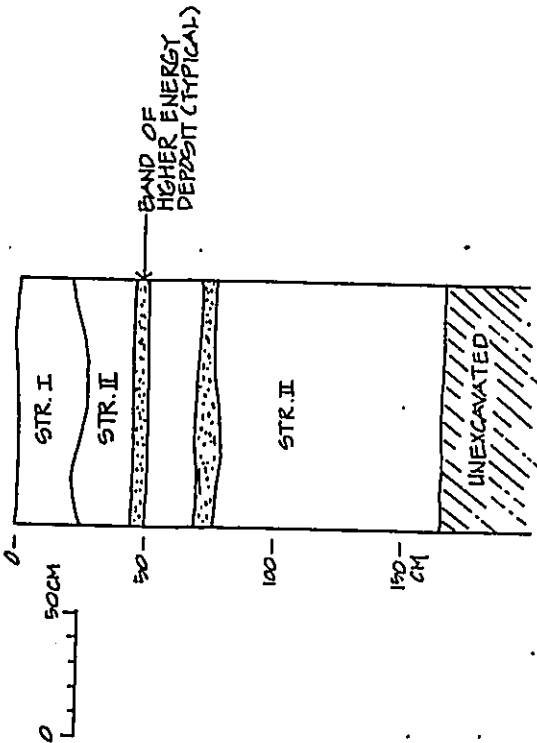
Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-29	10YR 4/3 brown, loose, structureless, medium sand. Typical sand A-horizon. Contains abundant roots and rootlets and some coral and shell pebble inclusions. No culture. Lower boundary clear/wavy.
Stratum II	25-BOE	10YR 6/4 light yellowish brown, loose to compact (with greater depth), structureless, medium to coarse sand. Contains several horizontal bands of coarse grained sand, shell and coral pebbles and small cobbles (higher energy deposit - 5-10 cm thick--semi-cemented). No culture. Few roots or rootlets. Str. II becomes more compact with greater depth, it eventually becomes semi-cemented.

Note: southwest end of trench is .28 m. higher than the northeast end. Even slope along the trench. Rise is due to the trench's location along the back slope (mauka) of the beach berm. The sandy loam is not present in this trench--all calcareous sand.

Figure 27 Backhoe Trench #16, Representative West/Northwest Profile

Trench BT#18: Orientation: 26206° TN; Length 4.5 m; Width: 0.8 m; Depth: 1.55 m;
 Profile: West Face



Profile Description		
Strata	Depth (cmbs)	Description
Stratum I	0-20	10YR 4/3 brown, loose, structureless, medium sand. Typical sand A-horizon. Contains abundant roots and rootlets and some coral and shell pebble inclusions. No culture. Lower boundary clear/wavy.
Stratum II	20-BOE	10YR 6/4 light yellowish brown, loose, structureless, medium to coarse sand. Contains several horizontal bands of coarse grained sand, shell and coral pebbles and small cobbles (higher energy deposit - 3-5 cm thick--semi-cemented). No culture. Few roots or rootlets.

The sandy loam is not present in this trench--all calcareous sand.

Summary of Trenches 1, 2, 3, 4, 15, 16, 17, and 18, excavated in the *makai* portion of Kekupua Valley

This portion of the project area consists entirely of calcareous sand deposits, with the exception of the recently deposited stratum I sandy loam. This sandy loam is not evenly distributed over this portion of the project area. Where it is found it caps the older sand A-horizon.

Two subsurface features were recorded and samples were taken from Trench 3. This deposit did not appear to extend horizontally, for it was not found in either Trench 16 or 18 on either side of Trench 3. Based on the available evidence the deposit is most likely historic and no State site number was assigned.

Figure 28 Buckhoe Trench #17, Representative North Profile

Trench BT#18: Orientation: 330/150° TN; Length 8 m; Width: .77 m; Depth: 2.3 m; water table at 2.23 m below surface; Profile: Northeast Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-140	2.5YR 3/3 dark reddish brown, silty clay loam, slightly compact, becoming more compact with depth & water saturation, structure only visible in top 50-60-cm, consists of moderate medium granular structure. Contains few roots & rootlets throughout. No culture. Lower boundary clear/smooth.
Stratum II	140-BOE	10YR 3/1 very dark grey, clay loam, slightly compact, water saturated, structureless. No roots or rootlets, no culture. Water table at 223 cmbs.

No indications of subsurface cultural deposits in this portion of the project area. Stratigraphy consists entirely of terrigenous sediments.

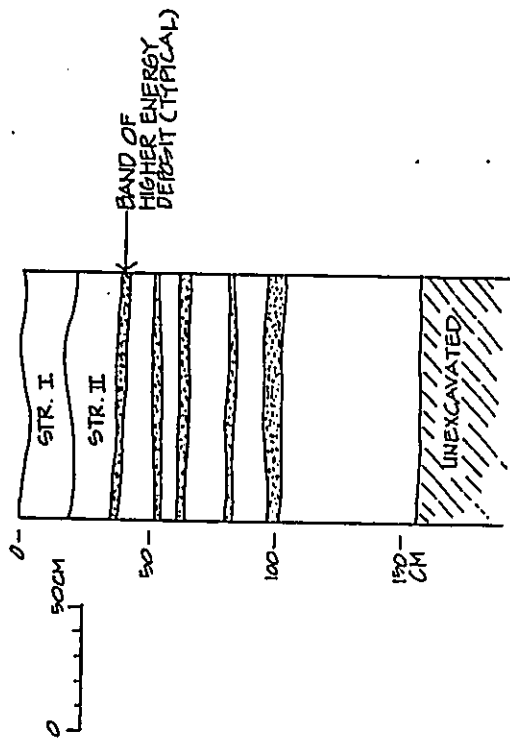
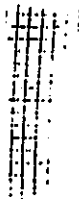


Figure 29 Backhoe Trench #18. Representative West Profile



Trench BT#20: Orientation: 28/208° TN; Length 8.2 m; Width: .75 m; Depth: 1.40 m;
 Profile: Northwest Face

Strata	Depth (cmbs)	Description
Stratum I	0-15	7.5YR 4/4 brown, loose, medium to fine sand. Structure is weak, fine to medium sub-angular blocky. Sand with faint A-horizon development with a little admixture of coloration from the reddish brown terrigenous sediment that is common in this area. Contains the same small water-rounded shells as Str. II, and abundant roots and rootlets. No culture. Lower boundary abrupt/wavy.
Stratum II	10-35	10YR 6/6 brownish yellow, loose, structureless, medium to fine sand. Contains small (1-3 mm diameter) water-rounded shell inclusions, some roots and rootlets. No culture. Lower boundary abrupt/smooth.
Stratum III	35-BOE	2.5YR 3/3 dark reddish brown, silty clay loam, slightly compact, becoming more compact with depth & water saturation, structure only visible in top 90-cm because of water saturation below that, consists of moderate medium granular structure. Contains few roots & rootlets throughout. No culture. Lower boundary clear/smooth.

This trench was excavated in the same general location as test unit 4. Trench 20 further confirms that no subsurface cultural deposits are located in this portion of the project area, where calcareous sands overlay terrigenous loam.

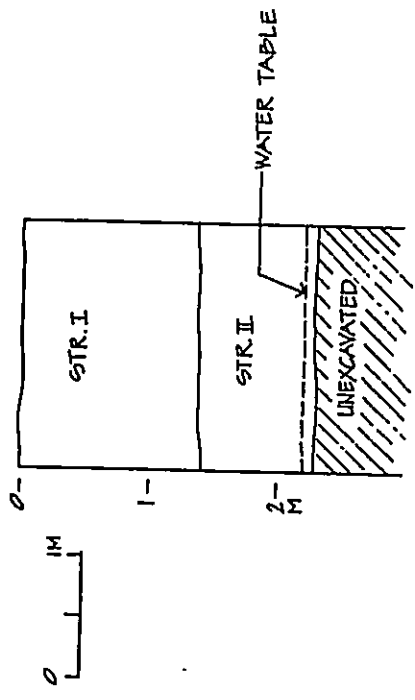
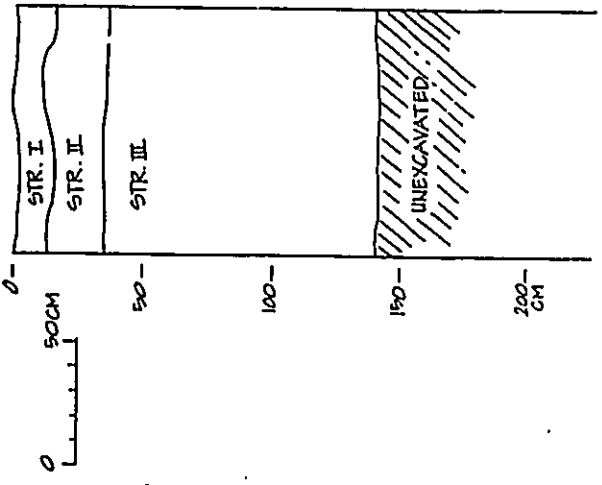


Figure 30 Backhoe Trench #19, Representative Northeast Profile

Trench BT#9; Orientation: 359/179° TN; Length 8.5 m; Width: .75 m; Depth: 1.4 m; Water table at 1.32 mbs; Profile: East Face

Note: 25 m. @ 330° TN from Portuguese oven



Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-45	10YR 3/3 dark brown, slightly compact, weak, fine to medium granular structure, silty loam. A-horizon containing roots and rootlets, some organic mixture. No culture. Lower boundary abrupt/wavy.
Stratum II	40-BOE	10YR 6/4 light yellowish brown, loose, structureless, fine sand. Contains very few roots and rootlets. No culture. Water table at 1.32 mbs.

No sign of subsurface cultural deposits in this trench. Trench 9 is the reverse of trench 20 where calcareous sands overlay terrigenous loam.

Figure 31 Backhoe Trench #20, Representative Northwest Profile

Trench BT#10: Orientation: 341/161° TN; Length 11 m; Width: .75 m; Depth: 2.26 m (max); Profile: West Face, See Figure 85 in Appendix 4.

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-120	2.5YR 3/4 dark reddish brown, slightly compact, structureless, gravelly (decomposing bedrock fragments) silty loam. Contains abundant roots/rootlets. This material has not developed <i>in situ</i> —it is a reworked decomposing bedrock sediment that was deposited by earthmoving equipment. Lower boundary abrupt/smooth.
Stratum II	120-140	5YR 3/3 dark reddish brown, slightly compact, weak to moderate, medium granular structure, loam. Contains abundant roots and rootlets, charcoal, and what appears to be coal slag—also basalt cobbles and historic artifacts including rusted nails, glass fragments, and a small medicine bottle. Lower boundary abrupt/smooth (discontinuous). See Figure 85 in Appendix 4.
Stratum III	140-190	7.5YR 3/3 dark brown, very compact, structureless, clay loam. Contains some roots/rootlets. No culture. Lower boundary abrupt/smooth.
Stratum IV	185-220	10YR 5/4 yellowish brown, very compact, structureless, clay. Contains few roots and rootlets. No culture. Lower boundary abrupt/smooth.
Stratum IV	220-BOE	10YR 5/1 grey, very compact, structureless, clay. Undulating basalt bedrock beneath.

All of stratum I and 2 are historically deposited, apparently by earth moving equipment, to create the artificial mound that marks the northern boundary of the fish pond. The clay loam that makes up stratum III may well have been the previous land surface before the earth moving. The cross-section shows the relationship of the Trench 10 sediments to the water level in Kekupua Fishpond. The bedrock exposed in Trench 10 is higher than the water level in the pond. This supports the findings of David A. Burney of Fordham University and William (Pila) K. Kikuchi of Kaula Community College that the pond rests in a natural bedrock depression, see Appendix 3. No prehistoric cultural deposits were found in this trench.

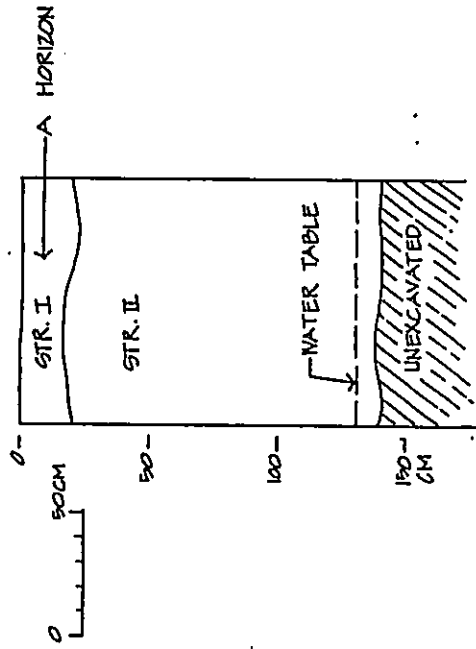


Figure 32 Backhoe Trench #9, Representative East Profile

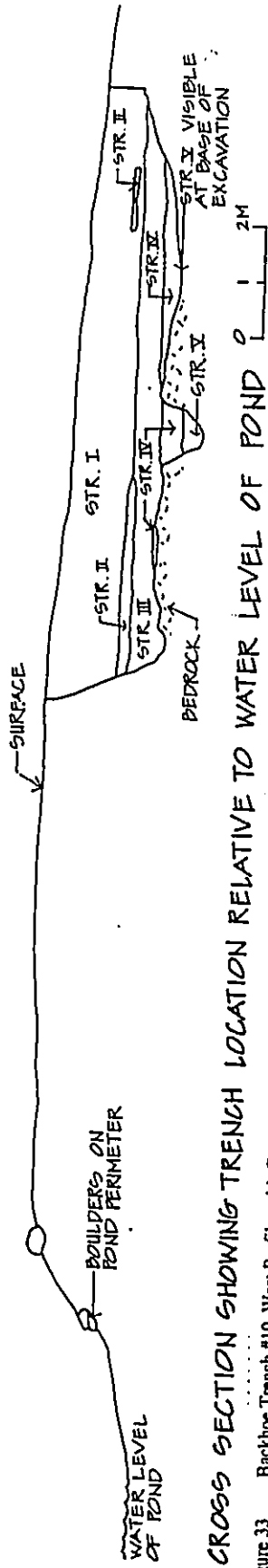
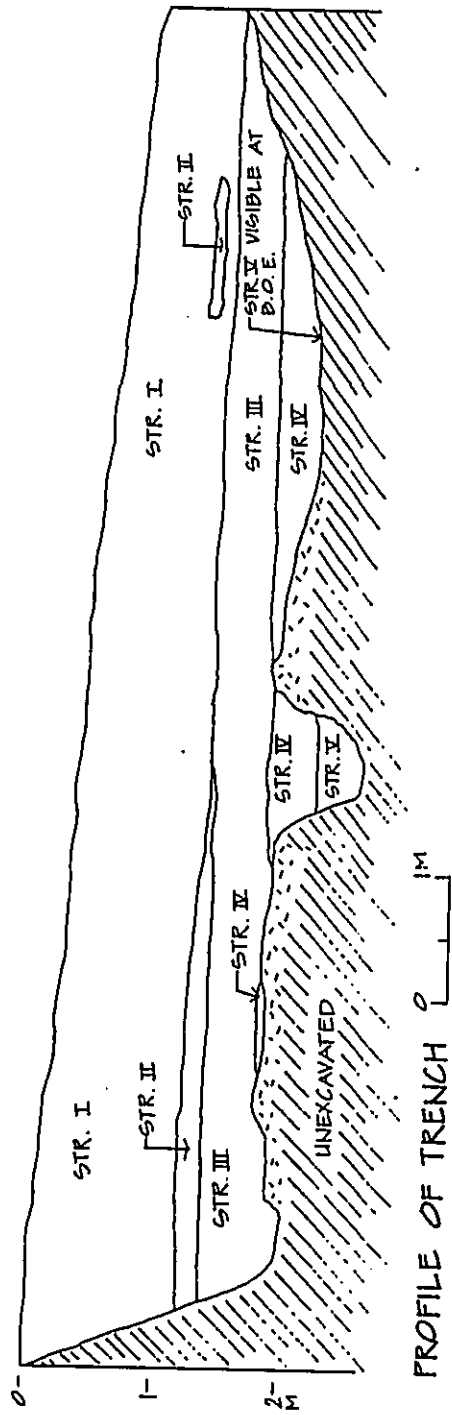


Figure 33 Backhoe Trench #10, West Profile, with Cross Section Showing the Relationship of Trench 10 sediments to the water table in Kekupua Fishpond.

Trench BT#11: Orientation: 369/180° TN; Length 3.5 m; Width: .75 m; Depth: 1.35 m;
 Profile: East Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-80	2.5YR 3/3 dark reddish brown, loose to compact (with greater depth), clay loam, with weak to moderate fine to medium blocky structure. Contains abundant roots and rootlets in upper 30 cm; much less below. No culture. Lower boundary gradual/smooth.
Stratum II	80-BOE	10YR 5/4 yellowish brown, very compact, structureless, clay. Contains few roots and rootlets. No culture.

All terrigenous sediments, no cultural deposits.

Summary of Trenches 19, 20, 9, 10, and 11 Located Around Kekupua Fishpond

The only cultural deposit located in this portion of the project area consisted of the historic stratum I and II of Trench 10. Stratum I is a massive terrigenous sediment that was apparently pushed into place with earth moving equipment to create the pronounced artificial berm that borders Kekupua Fishpond to the north. Stratum I contains decomposing bedrock fragments and apparently originated from the *mauka* portion of the project area. Stratum II contains historic artifacts, and what appears to be coal-slag. Trench 10 documents one event of massive earth moving that was carried out in the project area during the historic period. Based on the artifacts found in Stratum II, this took place sometime around 1900-1930.

Closer to the coast, in Trenches 9 and 20, The terrigenous sediments overlap with the calcareous sand beach deposits. In Trench 20 sand overlies terrigenous loam, while in trench 9 it is the opposite.

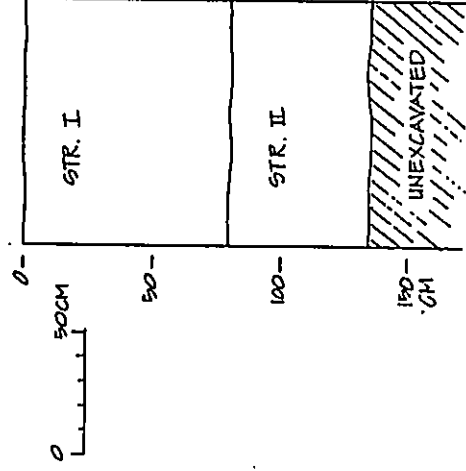


Figure 34 Backhoe Trench #11, Representative East Profile

Trench BT#21: Orientation: 14/194° TN; Length 10.2 m; Width: .75 m; Depth: 1.60 m;
Water table at 155 cm; Profile: Northwest Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-38	10YR 3/3 dark reddish brown, loose, loam, with moderate fine to medium granular structure, abundant roots and rootlets. A horizon. No culture. Lower boundary gradual/wavy.
Stratum II	35-105	10YR 6/6 brownish yellow, loose, fine sand, structureless. Contains some roots and rootlets. No culture. Lower boundary abrupt/smooth.
Stratum III	105-120	10YR 6/4 light yellowish brown cemented fine sand, structureless. No roots. No culture. Lower boundary abrupt/smooth.
Stratum IV	120-BOE	10YR 6/4 light yellowish brown, slightly compact fine sand, structureless. No roots. No culture. All sediment below III is wet. Water table at 1.55 mbs.

No cultural deposits found. The basic beach sand stratigraphy in this portion of the project area is capped by a dark brown loam. This loam could be a natural alluvial deposit or a historically introduced sediment related to earth moving and/or land clearance.

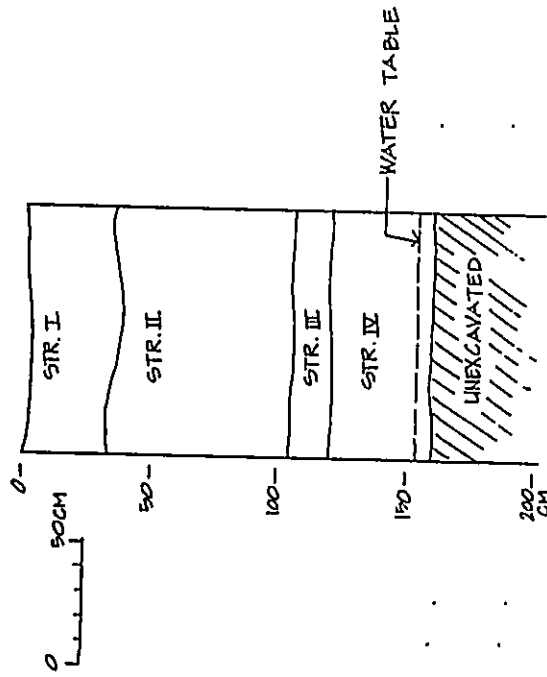


Figure 35 Backhoe Trench #21, Representative Northwest Profile

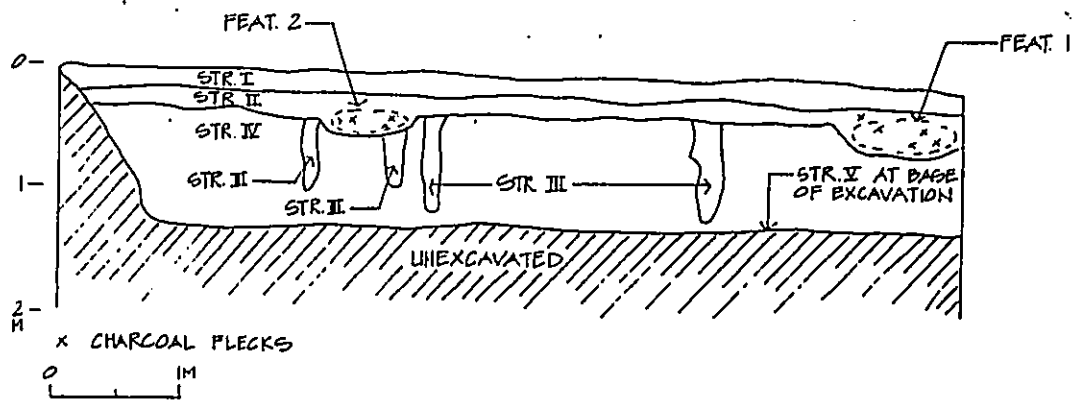


Figure 36 Backline Trench #7, East Profile

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Trench BT#7: Orientation: 17/197° TN; Length 7.0 m; Width: .75 m; Depth: 1.30 m;
Profile: East Face, See Figure 87 in Appendix 4.

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-20	2.5YR 3/4 dark reddish brown, compact, with weak, fine to medium blocky structure, loam. Terrigenous sediment. Contains some fine roots and rootlets. Lower boundary clear/wavy.
Stratum II	20-52	2.5YR 4/4 reddish brown, slightly compact, weak, medium granular structure, sandy loam. Mix of I and the underlying IV (sand). Contains some roots and rootlets and some charcoal flecking in Features 1 and 2 shown in the profile. Lower boundary abrupt/wavy. See Figure 87 in Appendix 4.
Stratum III	see profile	2.5YR 4/4 reddish brown medium sand, loose, structureless. This stratum consists of three root molds and an ant nest which have stained the stratum IV beach ssnd. Lower boundary clear/wavy.
Stratum IV	35-128	5YR 6/6 reddish yellow (stained from terrigenous sediments above) with 10YR 6/4 light yellowish brown (not stained), loose, structureless, medium sand. Contains a few roots and rootlets and no culture. Lower boundary abrupt/smooth.
Stratum V	128-BOE	At base of excavation cemented beach rock was encountered. 10YR 7/3 very pale brown. This could not be excavated.

Samples were screened through 1/8" mesh from Features 1 & 2--4.5 and 3 gallons, respectively. Based on sampling, each feature contains similar amounts of charcoal and marine shell midden. The Feature 1 sample yielded 7.7 g of charcoal and a total of 3.6 g of marine shell midden consisting of Echinoderm, *Brachidontes* sp., *Terebra* sp., and *Conus* sp. The Feature 2 sample yielded 11.1 g of charcoal and a total of 5.8 g of marine shell midden consisting of Echinoderm, *Brachidontes* sp., and small unidentifiable shell pieces. No artifacts, either historic or traditional-Hawaiian, were found in the screened samples. Unlike the vast majority of marine shell from the other features sampled in the project area, this shell was not waterworn and appeared unequivocally cultural in origin. Both

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features are associated with stratum II, a sandy loam mix of terrigenous and calcareous sediments.

Stratigraphic observations indicate this mixing of terrigenous and beach sediments in the *makai* portion of the project area is a relatively recent historic process, thought to be related to land clearance and/or ranching activity. Based on both features' association with stratum II and lack of traditional-Hawaiian artifacts (i.e. basalt or volcanic glass flakes), it is more likely that these features are not prehistoric. These features are thought to be remnants of historic hearth features. The cultural deposits are limited to the two features, charcoal and shell midden were not found in stratum II outside these features. This indicates the cultural deposit is localized and does not constitute a "cultural layer". No State site number was assigned to Features 1 and 2.

Strata I and II are thought to be historically introduced terrigenous sediments. This determination is based on the sediments weak structure and poor A-horizon development, which suggest relatively recent deposition of these sediments.

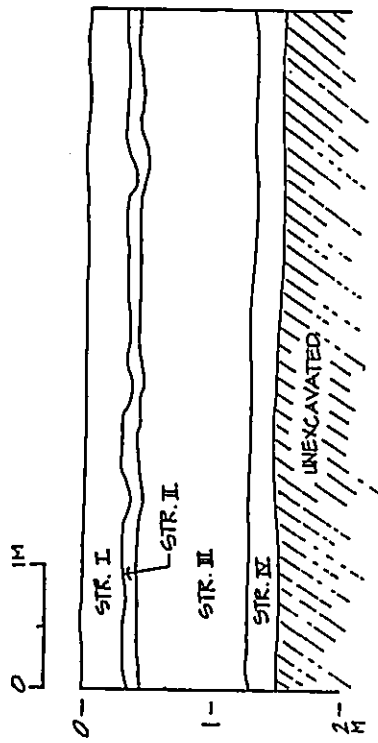
Trench BT#8: Orientation: 366/188° TN; Length 5.5 m; Width: .75 m; Depth: 1.5 m; Profile: East Face, See Figure 88 in Appendix 4.

Profile Description

<u>Strata</u>	<u>Depth (cmbs)</u>	<u>Description</u>
Stratum I	0-38	2.5YR 3/3 dark reddish brown, compact moderate, fine to medium sub-angular structure, sandy loam. Contains roots and rootlets. Lower boundary clear wavy.
Stratum II	30-45	2.5YR 4/3 reddish brown, slightly compact, weak, medium granular structure, sandy loam. Contains a few roots and rootlets. Lower boundary abrupt wavy.
Stratum III	40-130	10YR 6/4 light yellowish brown (with some staining from Str. I & II--5 YR 6/6 reddish yellow) loose, structureless, medium sand. Contains coral and shell pebbles. Lower boundary abrupt smooth.
Stratum IV	130-BOE	10YR 7/3 very pale brown, compact, structureless, coarse sand. Semi-cemented like beach rock--could only be excavated with difficulty.

No cultural deposits found. As in Trench 7, strata I and II are thought to be historically introduced terrigenous sediments. See Figure 88 in Appendix 4.

Trench BTW22: Orientation: 24/204° TN; Length 8.4 m; Width: .75 m; Depth: 1.50 m;
 Profile: West Face



Strata	Depth (cmbs)	Description
Stratum I	0-26	5YR 4/4 reddish brown, loose to slightly compact loam sand (with medium to coarse grained sand), weak, fine, sub-angular blocky structure, abundant roots and rootlets. Modern A-horizon, sand with terrigenous loam mixed in. No culture. Lower boundary clear/wavy.
Stratum II	26-BOE	10YR 7/4 very pale brown, loose, coarse to medium sand, structureless, very few roots and rootlets. No culture. Some reddish stained root molds extending from stratum I through stratum II to the base of excavation.

No cultural deposits found. Stratum I is the a mix of terrigenous and calcareous sediments, thought to be the result of historic earth moving and/or land clearing activity.

Summary of Trenches 7, 8, 21, and 22, Located West of Kekupua Fishpond and Makai of the Robinson Family Residence.

These trenches confirmed the presence of predominantly calcareous sand deposits in this portion of the project area. One or two strata of terrigenous, or terrigenous enriched, sediment were observed in the highest levels of these trenches. In Trench 21 it was unclear if this uppermost layer of brown loam, immediately above the calcareous sand, was historically introduced sediment or a natural alluvial deposit. Based on the soil color, more pronounced soil structure and A-horizon development, it is more likely that stratum I in Trench 21 is a natural alluvial deposit. In Trenches 7, 8, and 22 confidence is high that the red-brown terrigenous loams and sandy loams are historic introductions related to earth moving or land clearance in this portion of the project area.

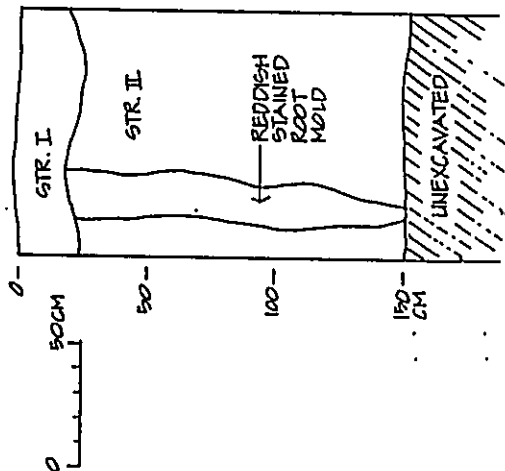
The only cultural deposits located in this portion of the project area consisted of the two charcoal and marine shell midden enriched features documented and sampled in Trench 7. Based on the lack of traditional-Hawaiian artifacts and the features' association with stratum II, thought to be a historically introduced sediment, these features are considered historic. Stratum II, outside of Features 1 and 2 did not contain cultural materials. These features represent isolated activity and are not part of a horizontal "cultural layer". No State site number was assigned to these two features.

Figure 37 Backhoe Trench #8, East Profile

Trench BT#5: Orientation: 58/238° TN; Length 8.0 m; Width: .75 m; Depth: 1.6 m;
 Profile: Southeast, Southwest, and Northwest Faces, See Figure 89 in Appendix 4.

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-15	10YR 4/3 brown, slightly compact, with weak medium granular structure, sandy loam. Contains terrigenous sediment and medium beach sand and abundant roots & rootlets. A horizon. Lower boundary clear/wavy.
Stratum II	15-110	10YR 4/3 brown, slightly compact, structureless, fine to medium sand. Somewhat mottled with the underlying III (beach sand). Str. II contains a few roots and rootlets, flecks of charcoal, and water rounded shell fragments and coral pebbles. It also contains numerous features that extend into the underlying stratum III. Lower boundary abrupt/wavy. Str. II is an older A-horizon buried, probably fairly recently, by Str. I.
Stratum III	30-BOE	10YR 6/4 light yellowish brown, loose, structureless fine to medium sand. It contains two bands of coral and shell pebble material, higher energy deposit, semi-cemented. Very few roots or rootlets, no culture. Lower boundary abrupt/wavy.



Eight features, each associated with stratum II and intruding into the underlying stratum III, were documented in Trench 5, see accompanying profile, see Figure 89 in Appendix 4. Five of these features were sampled to determine the feature fill contents and collect charcoal for radiocarbon dating. This was done to better establish the age and origin of the apparently prehistoric cultural stratum II. From Features 2 & 3, 3.5 and 4 gallon samples, respectively, were screened through 1/8th inch mesh. All material that did not pass through the screen was bagged and brought back to the laboratory. In the laboratory this material was sorted. Both samples yielded abundant water rounded coral and basalt pebbles—a natural component of stratum II. The Feature 2 sample yielded 44.9 g of water-rounded marine shell, 0.1 g of fishbone, and 25.9 g of charcoal. The Feature 3 sample yielded 0.5 g of un-water rounded *Brachidontes* sp. shell, 41.2 grams of water-rounded marine shell, 24.3 grams of charcoal, and a small (4 by 4 by 1.5 mm) volcanic glass flake. In both these samples the water-rounded shell is considered a natural component of Stratum II and not cultural in origin.

Figure 38 Backhoe Trench #22. Representative West Profile

Samples from Features 1, 4, and 6 were each screened and rapidly sorted in the field. Water rounded shell in these three samples was as abundant as in Features 2 and 3 and was not collected. For the field sorted samples only charcoal, artifacts, bone, and non-water-rounded marine shell were collected.

Seven gallons of Feature 1 were sampled. Two basalt flakes, 0.5 g of burnt, unidentifiable mammal bone, and 6.7 g of charcoal were collected from the Feature 1 sample. The entire collected charcoal sample was sent to Beta Analytic, Inc. for radiocarbon dating analysis. Twelve gallons of Feature 4 were sampled, yielding 0.3 g of *Terabiti* sp., 0.8 g of *Echinocherm*, 3.3 g of charcoal, and 8.8 g of small, unidentifiable mammal bone fragments. Five and a half gallons of Feature 6 were sampled, yielding 6.5 g of charcoal. The entire charcoal sample from Feature 6 was sent to Beta Analytic, Inc. for radiocarbon dating analysis.

Stratum II is an old A horizon that was fairly recently buried by the sandy loam of stratum I. Based on the sampling results the numerous features associated with stratum II are related to prehistoric habitation of the project area. Based on radiocarbon dating analysis this prehistoric occupation spanned the later prehistoric era, from the 15th century AD onwards. See Appendix 6.

This prehistoric, traditional-Hawaiian cultural layer was assigned State site # 50-30-09-792. This same horizontal cultural layer was documented in Trenches 5, 14, 23 and to a lesser degree in Trench 6.

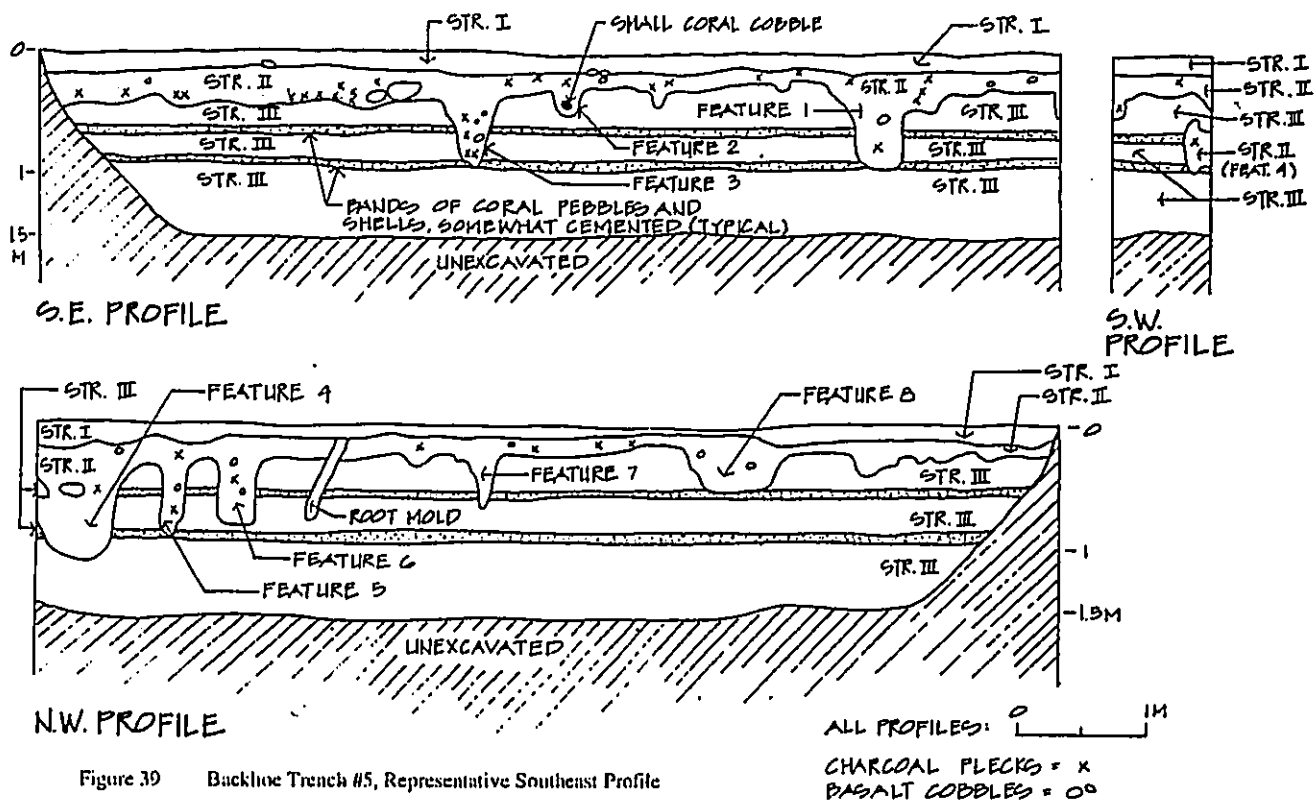


Figure 39 Backline Trench #5, Representative Southeast Profile

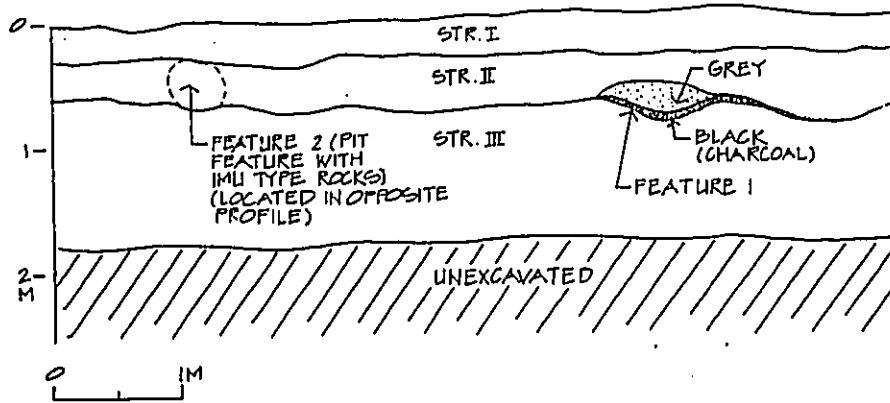


Figure 40 Backhoe Trench #6, Northeast Profile

106

Trench BT#6: Orientation: 45/225° TN; Length 6.6 m; Width: 95 m; Depth: 1.8 m; Profile: Northeast Face, See Figures 91 and 92 in Appendix 4.

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-40	10YR 4/3 brown, slightly compact, structureless coarse sandy loam. Contains abundant grass/roots, some modern kukui-nut shell fragments and water-rounded coral and shell. No culture. Modern A-horizon. Lower boundary clear/wavy.
Stratum II	41-90	10YR 4/3 brown, slightly compact, structureless, fine to medium sand. Contains a few roots and rootlets and water rounded coral and shell fragments. There are also two small features (1 and 2) that consist of ash and charcoal enriched sediment containing abundant small basalt cobbles. Both appear to be the remains of imu-type cooking features. Lower boundary abrupt/wavy.
Stratum III	70-BOE	10YR 6/4 light yellowish brown, loose, structureless fine to medium sand. Contains very few roots or rootlets. Lower boundary abrupt/wavy.

Approximately 5 gallons each from both Features 1 and 2 were sampled and passed through the 1/8th inch mesh screen. Sample content was noted in the field but not collected to bring back to the laboratory. This sampling removed nearly 100 % of the what remained of both features in the trench sidewalls. Both features yielded abundant fist-sized basalt cobbles, see Figure 92. The feature fill from both features was ash enriched and contained charcoal and water rounded shell and coral fragments, natural components of stratum II. A half-gallon bulk sample was collected from Feature 1. This sediment sample was not selected for radiocarbon dating because it was unclear if it contain sufficient carbon for successful dating analysis. These features are likely remnants of imu-type combustion features, see Figures 91 and 92 in Appendix 4. The age of these features is undetermined, however, it is likely they are associated with the prehistoric cultural layer (Stato Site #50-30-09-792) documented in Trenches 5, 14, and 23.

Stratum I is the same sandy loam, historically introduced partially terrigenous sediment that is found discontinuously in various portions of the project area. This layer is found in Trench 5 and 6, but not in Trenches 12 and 13, which were excavated between Trenches 5 and 6.

105

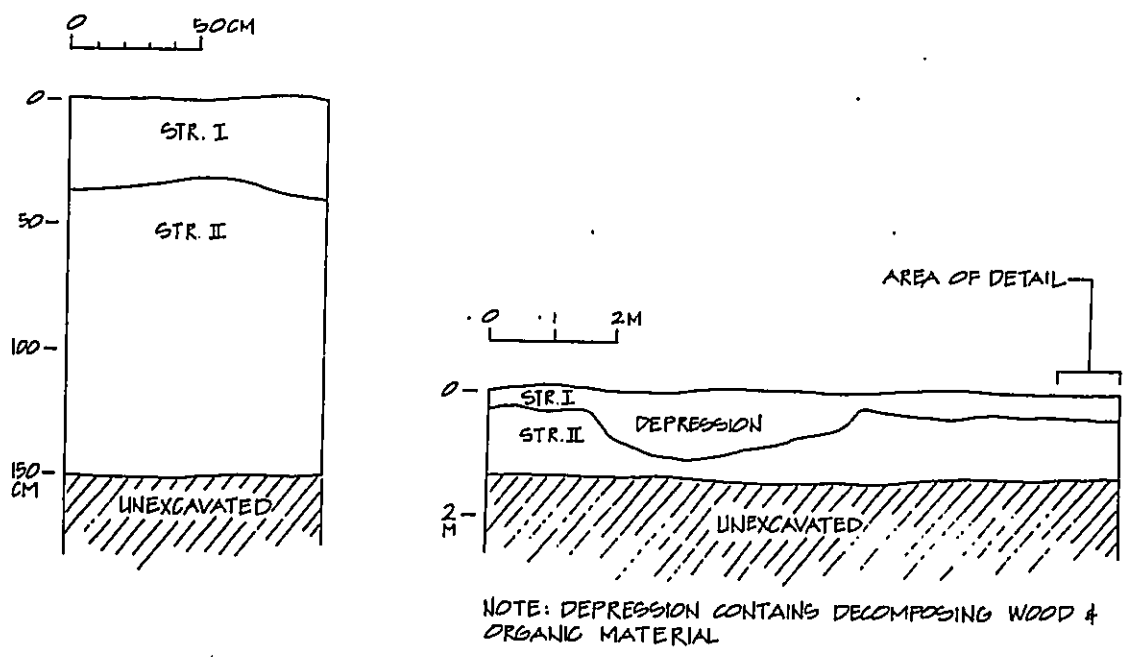


Figure 41 Backhoe Trench #12, Representative Southeast Profile

108

Trench BT#12: Orientation: 369/216° TN; Length 10.0 m; Width: 1.0 m; Depth: 2 m;
 Profile: southeast Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-40	10YR 4/4 dark yellowish brown, loose structureless, medium sand. A horizon. Contains abundant roots and rootlets. Lower boundary abrupt wavy. A large depression of stratum I into the underlying stratum II was observed in both side walls, see profile. This contained one basalt boulder and abundant decomposing branches and organic debris from land clearance. This is a recent feature associated with the land clearance of this portion of the project area.
Stratum II	40-BOE	10YR 6/4 light yellowish brown, slightly compact becoming more compact with depth, structureless, medium sand. Contains roots and rootlets and abundant water rounded coral and shell inclusions.

The only cultural material found in this trench consists of the modern large depression filled with recently deposited wood, branches, leaves and other organic material. This depression is the result of modern land clearance and earth moving within the project area. It may be related to the recent clean-up of the project area of the dead fall from Hurricanes Iniki and Iva. The discontinuous sandy loam layer was not found in this trench.

Trench BT#13: Orientation: 309/129° TN; Length 5.6 m; Width: 1.5 m; Depth: 1.5 m
(Cave in); Profile: Northeast Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-38	10YR 4/4 dark yellowish brown, loose structureless, medium sand. A horizon. Contains abundant roots and rootlets. Lower boundary abrupt wavy.
Stratum II	38-BOE	10YR 6/4 light yellowish brown, slightly compact becoming more compact with depth, structureless, medium sand. Contains roots and rootlets and abundant water rounded coral and shell inclusions.

No cultural material was observed in this trench. The sandy loam historically introduced sediment was not found in this trench.

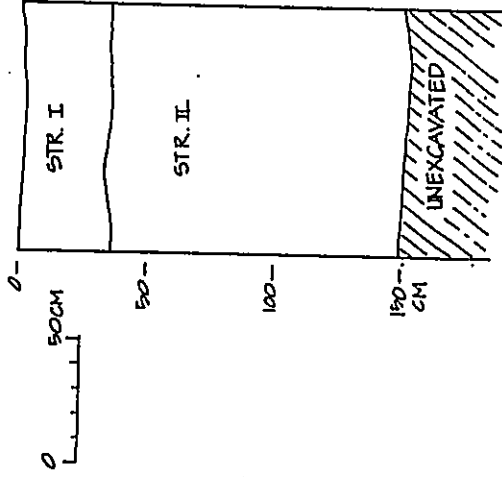


Figure 42 Backhoe Trench #13, Representative Northeast Profile

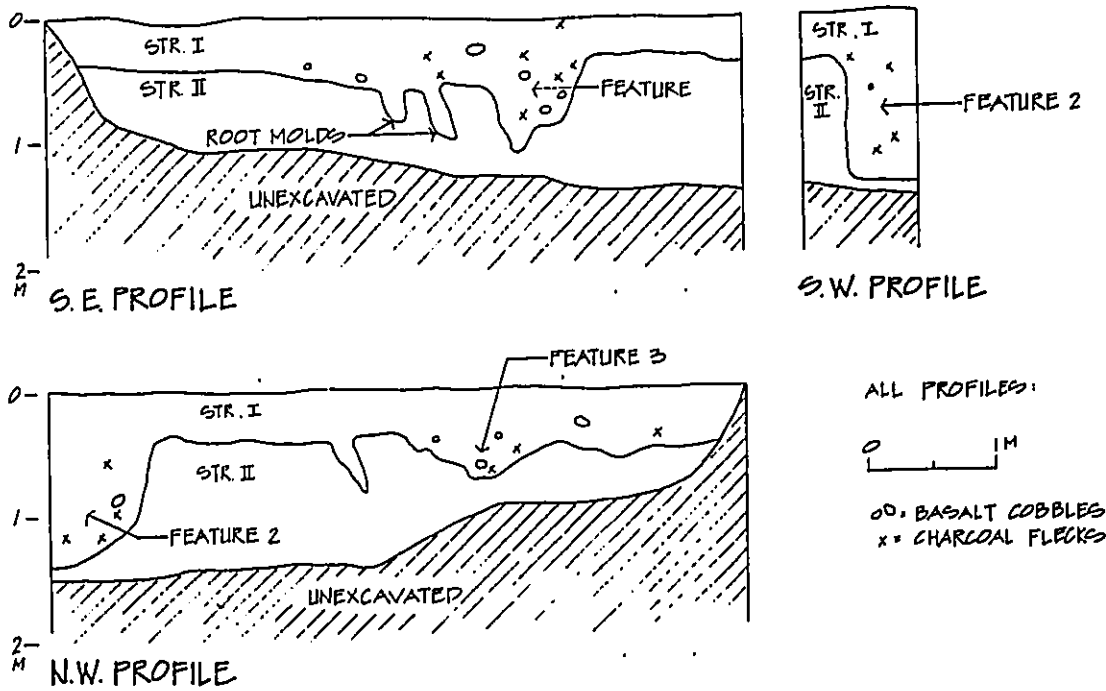


Figure 43 Backhoe Trench #14, Southwest Profile

112

Trench TT#14: Orientation: 44/224° TN; Length: 6.6 m; Width: 1.4 m; Depth: 1.6 m; Profile: Southeast Face, See Figure 90 in Appendix 4.

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-140	10YR 4/4 dark yellowish brown, loose structureless, medium sand. A horizon—somewhat mottled with the underlying beach sand. Contains abundant roots and rootlets and scattered basalt cobbles—also charcoal flecking. Three features were identified in the profile, intruding into the underlying stratum II. These cultural features were discernable from the trenches root molds. The feature fill contained charcoal flecking, basalt cobbles, and was darker in color—quite different from the root molds. Lower boundary abrupt wavy.
Stratum II	30-BOE	10YR 6/4 light yellowish brown, loose, structureless, medium sand. Contains roots and rootlets and abundant water rounded coral and shell inclusions.

Two of the three features documented in Trench 14 were sampled. This was done to help determine the age and origin of the apparent cultural layer stratum I. Feature 1 is irregular shaped. Four gallons of the feature 1 fill were screened through 1/8th inch mesh and sorted in the field. This sampled material contained two basalt flakes, 0.2 g of burnt, unidentifiable mammal bone, 3.6 g of charcoal, and 1.5 g of un-water rounded marine shell, consisting of Echinoderm, *Pinctada radiata*, *Conus* sp., and unidentifiable small fragments. No historic artifacts were found.

Feature 2 is large, over a meter across and extending a meter down into stratum II, and visible in the southwest and northwest profiles, see profile drawing, see Figure 90 in Appendix 4. Four gallons of the feature fill were screened. This contained one small basalt flake, 2.5 g of unidentifiable mammal bone fragments, 6.4 g of charcoal, and 2.3 g of un-water rounded marine shell, consisting of Echinoderm, *Brachidontes* sp., and *Pinctada radiata*. No historic artifacts were found.

Feature 3 was not tested, but looked to contain the same types and amounts of cultural materials. All features contained basalt cobbles, similar to *imu* stones seen in Ty#6.

Stratum I is the same A horizon that is buried in Trench 5 (stratum II in Trench 5). Based on the sampling results the numerous features associated with stratum II are related to prehistoric habitation of the project area.

Trench BT#23: Orientation: 26/226° TN; Length 8.0 m; Width: 1.0 m (cave-in); Depth: 1.4 m; Profile: Northwest Face

Profile Description

Strata	Depth (cmbs)	Description
Stratum I	0-25	10YR 4/3 brown, slightly compact, with weak medium granular structure, sandy loam. Contains terrigenous sediment and medium beach sand and abundant roots & rootlets. A horizon. Lower boundary abrupt/wavy.
Stratum II	15-BOE	10YR 4/3 brown, slightly compact, structureless, fine to medium sand. Somewhat mottled with the underlying III (beach sand). Str. II contains a few roots and rootlets, flecks of charcoal, and water rounded shell fragments and coral pebbles. It also contains a large feature (Feature #1--human burial) and a large root mold that extend into the underlying stratum III. Lower boundary abrupt/wavy. Str. II is an older A-horizon buried, probably fairly recently, by Str. I.
Stratum III	20-BOE	10YR 7/3 very pale brown, loose to slightly compact (with greater depth), structureless, medium to coarse sand. Contains abundant water rounded coral & shell pebbles and very few roots and rootlets. No culture.

The root mold in the trench profile contains decomposing roots and is clearly a natural feature extending down from the present land surface.

Feature 1 is a burial pit-feature containing what appears to be a complete human skeleton. The completeness of the skeletal remains could not be established with great certainty without the complete excavation of the burial, however, this estimation of completeness is based on the identification of skeletal material from the head, torso, arms, hands, and feet, suggesting a fairly complete skeleton. The burial was located at the base of the excavation, at what appears to be the base of Feature 1 at 140 cmbs. Identified human remains included the shaft portion of an ulna, a portion of the pelvis, a metacarpal, a foot phalange, and a canine tooth with a pronounced carie. A large water rounded basalt boulder measuring 25 cm thick by 35 cm long, was found in the Feature 1 fill directly above the burial, see profile. Also found in the Feature 1 fill were basalt flakes, a fragment of a young pig jaw with molars intact, and marine shell midden. No samples were collected from Feature 1, and all skeletal remains were placed back within Feature 1 before Trench 23 was backfilled. Feature 1 was not visible in the opposite (southeast) trench profile. With

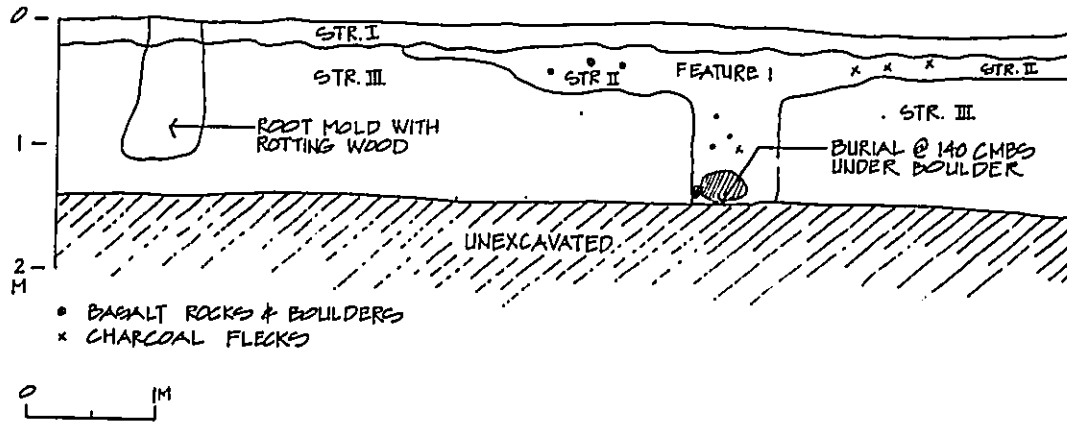


Figure 44 Backhoe Trench #23, Representative West Profile

the possible exception of the large basalt boulder, no burial goods were found with the burial. However, it should be stressed that only the barest minimum of the burial was exposed. Only that which was sufficient to insure its positive identification as a human burial.

The bone material that was seen is fragmentary and poorly preserved. There was no indication that more than one individual was present. No estimations of sex or ethnicity of the individual could be made from the skeletal fragments that were observed. The individual is not a child judging from the canine tooth.

Based on general context—an unmarked burial in coastal sand deposits, with no apparent historic artifacts in association, within what is most likely a prehistoric cultural deposit—it is more likely that the burial is pre-historic/early historic Native-Hawaiian. The burial location was marked with a vertical pole and yellow flagging tape. This pole is protruding 4 inches from the surrounding land surface to allow for easy location of the burial should there be the need. The burial is located 41 meters, at 168 degrees true north from the lone monkey pod tree immediately *makai* of the dry pond noted in Figures 5 and 21.

The burial was found on the afternoon of Saturday, January 22, 2000. As it was a weekend, SHPD notification procedures had to be postponed until Monday morning. On Monday, January 24th, 2000, Mr. Kana'i Kapeliela of the SHPD Burials Program and Ms. Nancy McMahon, SHPD Kauai archaeologist, were each notified of the burial find.

Stratum II is the same buried A-horizon cultural layer documented in Trenches 5 and 14.

Summary of Trenches 5, 6, 12, 13, 14, and 23 Located in the West Corner of the Project Area

In this portion of the project area the sediments are almost exclusively calcareous sand. The discontinuous, historically introduced sandy loam has a terrigenous component, but this thin layer is only found at the surface of Trenches 5, 6, and 23. Evidence of modern land disturbance was documented in Trench 12. A prehistoric/traditional-Hawaiian cultural layer was documented and sampled in Trenches 5, 6, 14, and 23. This layer contains the remains of traditional-Hawaiian habitation and related activities, including charcoal, basalt and volcanic glass flakes, marine shell and fish and mammal bone midden, and numerous intrusive pit-features that extend into the underlying culturally sterile beach deposits. A human burial, thought to be prehistoric or early historic Native-Hawaiian based on available evidence, was also documented in association with this burial. The cultural layer was assigned State site # 50-30-09-792, with the layer itself designated Feature A and the human burial designated Feature B. With one burial found in association with this cultural layer, it would not be surprising for there to be more.

4. Summary of Subsurface Backhoe Testing

As expected, sediments in the *makai* portion of the project area are predominantly calcareous beach sand. Only in the area immediately around Kekupua Fishpond were substantial terrigenous sediments found. No evidence of prehistoric/traditional Hawaiian subsurface deposits was found in terrigenous sediments. Evidence of massive historic earth moving was documented in Trench 10, where an artificial berm was created along the northern boundary of Kekupua Fishpond.

Loam and sandy loam terrigenous sediments appear to have been deposited discontinuously over many portions of the project area. Based on field observations these deposits are most likely recent historic or modern and related to land clearance or earth movement. An apparently historic or modern sandy loam deposit was often observed immediately above the older, now buried sand A-horizon.

Beside the historic fill layers documented in Trench 10, subsurface evidence of cultural activity was documented in three locations during the backhoe testing. Two of these locations, Trenches 3 and 7, consisted of discontinuous cultural deposits, charcoal flecking and marine shell, in pit-features. The cultural deposits in Trenches 3 and 7 are most likely historic and were not assigned State site numbers.

The third location consisted of the extensive prehistoric/traditional-Hawaiian cultural layer that was documented and sampled in Trenches 5, 6, 14, and 23 at the project area's west end. A most likely prehistoric/early historic Native Hawaiian burial was located in association with this cultural layer. The layer was assigned State site # 50-30-09-792.

The backhoe testing adequately sampled the *makai* portions of the project area for subsurface cultural deposits. The *mauka* portion of the parcel was not sampled with backhoe trenches based on observations made during the pedestrian inspection of this region. These observations indicated little likelihood of buried cultural deposits in the project area's *mauka* terrigenous sediments.

The discovery of a human burial in these sandy coastal deposits is hardly surprising. There is a reasonable probability that as yet undiscovered human burial remains are located within the project area's sandy deposits. Accordingly, archaeological monitoring should take place during project area development when these sandy coastal deposits will be disturbed, see recommendations section below.

VII. SUMMARY

The project area is a beachfront property located in the *ili* of Kapalawai in Makaweli on the island of Kauai. The property is *makai* of Kaunua'i Highway. The northern boundary is a barbed wire fence and a rock wall covered with bougainvillea that parallels Kaunua'i Highway. The southern boundary is the Pacific Ocean. A *akukui* Stream is the eastern boundary. The western project area boundary is a rock wall. These features enclose an area of approximately 170 acres. The Mahikona Stream passes through the central portion of the parcel. There is a man-made bog in the western end. For descriptive purposes the project area is divided into two lots. Lot 1 is in the northwest corner. It is enclosed by rock walls and fences, and contains a land area of approximately 26 acres. Lot 1 contains the living quarters of the property. Lot 2 is much larger at approximately 144 acres. It is primarily used as pasture land for cattle. The terrain slopes gently up *mauka*, and is relatively flat. In the middle of Lot 2 is Kekupua Fishpond which is fed by three natural springs.

The project area is located close to Waimea River where Captain James Cook first set foot in Hawaii in 1778. At that time he recounts a scene of houses and taro production in the area. Nearby, in 1816, the Russian-American Company built Fort Elisabeth under the direction of Georg Schäffer. A year after it was built the fort was abandoned by the Russians and occupied by Hawaiians under the rule of Kaunua'i. In 1831, the many cattle that had been introduced to Kauai were being ranched for the first time. At the time of the *Māhele* in 1845, the land use pattern for the area was predominantly agriculture throughout the fertile valleys of Waimea and Makaweli. Shortly after the *Māhele* the land owners of the current project area arrived in Hawaii. The Robinson family in Hawaii dates back to 1863, when Eliza Sinclair brought her family from New Zealand and bought Ni'ihau, and later extensive acreage on Kauai (*Honolulu Advertiser*, 1999). The Robinson family acquired the property in 1865, and it has been in their possession ever since (oral interview with Warren Robinson, 2/17/99). They built the first structure there (main house) in 1897. Over time, the area within Lot 1 had developed into the living quarters for the land owner and the workers. "The Kapalawai house was once the family compound and heart of the clan's sugar and cattle enterprises" (*Honolulu Advertiser*, 1999). Lot 2 was made into a pasture which it is still used as today.

Kekupua Fishpond, documented in *Māhele* records, and the prehistoric/traditional-Hawaiian cultural layer at the project area's west end, are the only pre-contact sites found within the project area. All other sites and structures found were related to the Sinclair-Robinson era. Subsurface testing results did not reveal the presence of any subsurface traditional-Hawaiian deposits near the fish pond, or in most of the coastal sand deposits.

The archaeological pedestrian inspection consisted of a systematic walk over of the entire project area. As was expected, a variety of historic sites directly related to the Robinson family occupation were located within the project area. A total of five historic properties were located and recorded during the pedestrian inspection. They are summarized below. Most of the sites located during the inventory survey are concentrated in and around Lot 1

(see Figure 5 above), which was the main habitation area for the Robinson family. An additional historic property, the prehistoric/traditional-Hawaiian cultural layer, was subsequently located during the subsurface testing phase of the project. This site is also summarized below.

Site 50-30-9-762 is a wall system in and around the camp compound in Lot 1. It consists of six separate components.

- Feature A: A rock wall on the west side of the driveway with rock column and iron gate.
- Feature B: A rock wall on the east side of the driveway with rock column and iron gate.
- Feature C: A rock wall along the old government road at the northern project area boundary.
- Feature D: A rock wall that is the western boundary. It extends into Lot 1.
- Feature E: A series of rock walls and extensions within the camp area of Lot 1.
- Feature F: A rock terrace near the entrance to the camp area in Lot 1.
- Feature G: Iron try-pot

Site 50-30-9-763 is a 48.5m (155 ft.) by 23m (73.5 ft.) stone platform.

Site 50-30-9-764 is the main house complex within Lot 1. It consists of 14 structures.

- Feature A: The main house.
- Feature B: The guest house/current residence.
- Feature C: The servants quarters/current offices.
- Feature D: The carriage house/current garage.
- Feature E: The remnants of a tack room.
- Feature F: The greenhouse.
- Feature G-N: Employee cottages.

Site 50-30-9-765 is the 6-acre Kekupua Fishpond.

Site 50-30-9-766 is a Portuguese brick oven.

Site 50-30-9-782 consists of an extensive prehistoric/traditional-Hawaiian cultural layer that was documented and sampled in backhoe Trenches 5, 6, 14, and 23 at the project area's west end. A most likely prehistoric/early historic Native Hawaiian burial was located in association with this cultural layer.

Hand excavated subsurface testing was performed in and around State Site 50-30-9-763, and at the juncture of the Mahikona Stream and shoreline. Three test units were excavated on the surface of the platform (State Site 50-30-9-763). Test Units 1, 2, and 3 did not yield midden, charcoal, or artifacts of any kind. Test Unit 2 was excavated into the mounded ridge extending down the center of the platform. The results of Test Unit 2 indicate the paved surface of the platform is continuous and that the ridge postdates the construction of the surface of the platform. Five shovel test pits were placed around the

perimeter of the platform to look for cultural deposits. The shovel test pits revealed the rocky nature of the soil surrounding the platform. These pits did not yield midden, charcoal, or artifacts of any kind. The findings indicate a sterile environment in and around the platform. A single test unit was excavated above the west bank of Mahikona Stream where the vegetation begins behind the beach. Test Unit 4 was excavated to a maximum depth of 1.30mbs (4 ft.) and yielded a cultural layer (stratum 2) between .68mbs (2 ft.) and .84mbs (2.5 ft.). Historic metal pieces were found. Additionally, the west bank of Mahikona Stream was excavated at the beach only to reveal boulders used to reinforce the bank and driftwood. No major sub-surface deposits were found within the proposed project area.

Backhoe subsurface testing was carried out throughout the *maka'i* portion of the project area. Twenty-three trenches were excavated, documented, and sampled. The detailed results as well as a general summary of this work are summarized above.

Background research revealed a substantial amount of historic modification to the project area for the purpose of ranching. Field observations confirmed that the project area has been utilized for ranching, agriculture and residential habitation. During the backhoe subsurface testing, evidence of historic and modern earth moving and sediment redeposition were documented.

VIII. SIGNIFICANCE EVALUATIONS

Site significance was evaluated using five broad criteria defined by the State of Hawaii and National Registers of Historic Places (HRS 6E-10 and 6E-5.5). A cultural site is determined to be significant if the:

- A. Site reflects major trends or events in the prehistory or history of the state or nation.
- B. Site is associated with the lives of persons significant in our past.
- C. Site is an excellent example of a site type.
- D. Site has yielded or is likely to yield information important to prehistory or history.
- E. Site has traditional cultural significance to an ethnic group.

Significance Table

The following table provides a summary of the significance evaluation of each site and feature within the proposed project area.

Site #	Brief Description	Significance Criteria				
		A	B	C	D	E
50-30-9-762	Ranching/Agricultural Infrastructure					X
50-30-9-762/A	Rock wall					
50-30-9-762/B	Rock wall					
50-30-9-762/C	Rock wall					
50-30-9-762/D	Rock wall					
50-30-9-762/E	Rock wall					
50-30-9-762/F	Rock terrace					
50-30-9-762/G	Iron try pot					
50-30-9-763	Rock platform					X
50-30-9-764	Robinson Family Compound*					X
50-30-9-764/A	Main house					
50-30-9-764/B	Guest house					
50-30-9-764/C	Offices					
50-30-9-764/D	Carrage house					
50-30-9-764/E	Tack Room					
50-30-9-764/F	Greenhouse					
50-30-9-764/G-N	Employee cottages					
50-30-9-765	Kekupua Fishpond		X			X
50-30-9-766	Portuguese Oven			X		X
50-30-9-762/A	Precontact Cultural Layer				X	X
50-30-9-762/B	Human Burial					X

*Significance determined by Mason Architects, Inc. in a report accepted by Ms. Carol Ogatta, Branch Chief Architecture Branch, SHIPDDLNR (Mason Architects, Inc. 2000)

State Site # 50-30-9-762 (Rock Walls, Rock Terrace, and Iron Try Pot)

This is a multiple feature site composed of seven features (A-G) which include a series of rock walls, one terrace, and the iron try pot. These features are associated with Robinson Family ranching and agricultural activity.

The walls are difficult to date, but the property boundary wall features besides defining property limits, appear to have been constructed to provide a certain amount of privacy to the landowner. The larger walls likely also served to keep cattle out of the Robinson residential compound. The smaller camp wall features and terrace seem customized for use in and around Lot 1. The iron try-pot (feature G) is significant under two different contexts. This artifact relates to a period of history (the whaling era) for which we believe very few artifacts exist in the Waimea area. This try-pot is a historically significant artifact, based on its original use in the whaling industry. In its current context, the iron try-pot is significant as part of the ranching infrastructure because of its use as a feed trough. Site 762 is significant under criterion 'D'.

State Site # 50-30-9-763 (Rock Platform)

The 48.5 x 23 x 2.5 meter (155 x 74 x 8 ft.) platform has a relatively even surface that slopes from its high end at the south downward to the north. There are five identifying characteristics on the surface of the platform: Two linear paved depressions, a mounded ridge extending down the center, an oval mound, and a constructed pit. A total of 8 test units were excavated in and around the structure. Testing revealed no cultural materials of any kind. Testing also revealed the structure had been modified through multiple phases of construction. The surface is relatively even, not pitted, and its construction required a substantial amount of time and effort. Based on these observations it is assessed as historically significant under criteria 'D'.

State Site # 50-30-9-764 (Historic Buildings)

This site consists of fourteen historic structures (Features A-N) which include: the main house, a guest house, offices (previously servants quarters), a carriage house/garage, a tack room, a greenhouse and eight employee cottages.

The main house dates back to 1897 and "is an example of the Queen Anne style, which is a sub-type of the Victorian style, typical of the turn-of-the century period" (Masons Architects, Inc. 1999:20). The house was one of the first buildings constructed on the property and it was "designed by C.F. Ripley and Arthur Reynolds, prominent architects during that period in Hawaii" (*ibid.*:21). These structures were built for the Robinson family, a prominent landowner with a long history in Hawaii. For these reasons, Features A-C are assessed significance by Mason Architects, Inc. based on criteria 'B' and 'C'. Features D-N were evaluated by Mason Architects, Inc., as well. Their significance evaluations are part of Mason Architects, Inc., historic structures report, which was accepted by the SHPD/DLNR architecture branch in February 2000.

State Site # 50-30-9-765 (Kekupua Fishpond)

Kekupua Fishpond measures roughly 309 x 120 meters (989 x 384 ft.). This fishpond has a number of historic modifications, and is not currently in use. It is, however, a good example of a fishpond, and could yield more information through further testing. For these reasons, its significance is based on criteria 'A', 'C' and 'D'.

The landowner is committed to preservation and restoration of the fish pond. This maintenance process could disturb the bed of the pond. In an effort to obtain datable material and advance the field of paleoecological studies in Hawaii, it was recommended that coring samples be taken prior to cleaning. Paleoecology studies the characteristics of ancient environments and their interrelationships with ancient plants and animals. The study of pollen assemblage from datable core samples has yielded data allowing for paleoenvironmental reconstruction. Research performed by Athens *et al.* (1992), Athens and Ward (1991), Wickler *et al.* (1991), and Hammatt *et al.* (1990) has had success in reconstructing paleoecological systems in Hawaii.

On May 29, 1999, Cultural Surveys Hawaii, Inc., in coordination with Dr. William Kikuchi and Dr. David Burney, conducted coring tests at the fishpond. The results of the coring are included as an addendum to this report (Appendix 4).

State Site # 50-30-9-766 (Portuguese Oven)

This mortared stone and brick oven measures roughly 2m² (6.5 sq. ft.), and is clearly historic. It is in very good condition, and a good example of this feature type. Therefore, it is significant under criterion 'C' and 'E'.

State Site # 50-30-9-792 (Traditional-Hawaiian Cultural Layer and Human Burial)

Site 50-30-9-792 consists of subsurface cultural deposits containing the charcoal-enriched sediments, pit-features, artifacts, and midden associated with prehistoric or early historic traditional-Hawaiian occupation. The site is significant under Criterion D of the State and National Registers of Historic Places for its information content regarding traditional-Hawaiian coastal habitation in this portion of Kauai. The age and ethnicity of the human burial associated with the cultural layer (Feature B), based on the available evidence, is most likely a prehistoric or early historic Native-Hawaiian. Accordingly, the site also has traditional cultural significance to Native Hawaiians and is significant under Criterion E of the State and Register of Historic Places.

IV. MITIGATION RECOMMENDATIONS

Mitigation Table

The following table summarizes the mitigation recommendations of all sites and features found within the proposed project area.

SITE #	DESCRIPTION	MITIGATION RECOMMENDATIONS
50-30-9-762/A	Rock wall	No further historic preservation work
50-30-9-762/B	Rock wall	No further historic preservation work
50-30-9-762/C	Rock wall	No further historic preservation work
50-30-9-762/D	Rock wall	No further historic preservation work
50-30-9-762/E	Rock wall	No further historic preservation work
50-30-9-762/F	Rock terrace	No further historic preservation work
50-30-9-762/G	Iron try-pot	No further historic preservation work
50-30-9-763	Rock platform	Preservation
50-30-9-764/A	Main house*	Preservation in place with no buffer zone
50-30-9-764/B	Guest house*	Preservation and restoration
50-30-9-764/C	Offices*	Preservation and restoration
50-30-9-764/D	Carrriage house/Garage*	Preservation and restoration
50-30-9-764/E	Tack Room*	Photo Documentation before removal
50-30-9-764/F	Greenhouse*	Photo Documentation before removal
50-30-9-764/G-N	Employee cottages*	Photo Documentation before removal
50-30-9-765	Kekupua Fishpond	(Being evaluated by Mason Architects, Inc.)
50-30-9-766	Portuguese Oven	Preservation and restoration
50-30-9-792/A	Cultural Layer	Preservation
50-30-9-792/B	Human Burial	Preservation/Monitoring During Construction
		Preservation

* Recommendations based on the work of Mason Architects, Inc. (2000).

State Site # 50-30-9-762 (Rock Walls, Rock Terrace, Iron Try-Pot)

This site contains seven features (A-G) which are a series of rock walls, a rock terrace, and an iron try-pot.

It was determined that this site is related to the Robinson family era of occupation at Kapalawai. The majority of the walls were boundary walls or associated with use specific to the needs of the Robinson family. The iron try-pot, in its present context, is related to

ranching infrastructure. The information content of the site has been documented during the inventory survey. With the exception of the iron try-pot (Feature G), no further historic preservation work is recommended for the site. We do recommend, however, in keeping with the ambiance of the Robinson estate, that the proposed development plans integrate these features into the project design as much as possible.

Feature G, the iron try-pot, is the only feature of Site # 50-30-9-762 recommended for preservation. Iron try-pots, a remnant of the whaling era, were incorporated into the sugar and ranching industries. At Kapalawai, iron try-pots were filled with sugar molasses and put in the pastures to feed the cattle. Adjacent to the fish pond is the only remaining try-pot on the property. Iron try-pots are uncommon enough and because of its interesting history and its contribution to an important era, we are recommending preservation. We also recommend construction of a moderate roof structure to shelter it from the weather.

State Site # 50-30-9-763 (Rock Platform)

Test excavations did not yield any information regarding the function and age of this rock platform. Oral interviews suggested the site was used as a clearing mound in the 1940's. However, community concerns have been expressed as to whether a clearing mound was its sole function. There were other factors which raised serious questions regarding the "clearing mound" theory. The presence of certain sub-features (a paved depression and a well-constructed pit), along with the size of the structure and the amount of time and effort taken to construct it and pave the entire surface, are difficult to reconcile with this being simply a clearing mound. Due to remaining uncertainty regarding the function of this highly anomalous site, we are recommending preservation. For these reasons, preservation is being recommended, with no buffer zone. The landowner has agreed to this arrangement.

State Site # 50-30-9-764 (Historic Buildings)

This site consists of fourteen historic structures (Features A-N): the Aubrey Robinson home, a guest cottage, servants quarters which are now used as offices, a carriage house/garage, a tack room, a greenhouse and outlying worker's cottages.

Since this site consists of historic buildings, it is beyond our scope of work and expertise to evaluate this site. A proper evaluation by an architectural historian to evaluate 1) its architectural and historic merit and 2) assess its present integrity was made by Mason Architects, Inc. Based on their report (July, 1999), the main house, the guest house, and the offices are being recommended for preservation and restoration. Due to the "poor condition" and the fact that repairs needed would require so much reconstruction that very little historic material would remain, diminishing much of the building's historical integrity", the recommended mitigation for the carriage house, tack room and greenhouse is photographic documentation before removal of these three structures (Mason Architects, Inc. 1999:22). Mitigation recommendations for the workers' cottages (Features G-N) are available in the revised historic structures report for Kapalawai by Mason Architects, Inc. (2000). This report has been approved by the architecture branch of the SHPDDLNR.

State Site # 50-30-9-765 (Kekupua Fishpond)

The landowner is committed to the preservation, cleaning and restoring of Kekupua Fishpond. At present, expertise is being sought out as how best to accomplish this restoration. Any restoration efforts will be accomplished in consultation with the State Historic Preservation Division. The fish pond is being recommended for restoration and preservation following documentation of sediments (See Appendix 4).

Mo'o Stone

Additionally, there is a *Pohaku* (rock) in the fish pond associated with a *mo'o uahine* legend, which is now covered by water and debris and cannot be seen. It is recommended that before restoration work on the pond begins, this *Pohaku* (rock) be located and that it be preserved in place. We also recommend that Mr. Hakila Callahan be contacted to identify the exact location of the *Pohaku* (rock).

State Site # 50-30-9-766 (Portuguese Oven)

This oven is a wonderful example of its kind and represents an ethnic group important in the history of Hawai'i. The recommendation is to preserve the oven in place on the property.

State Site # 50-30-9-792 (Traditional-Hawaiian Cultural Layer and Burial)

State Site # 50-30-9-792 consists of a traditional-Hawaiian cultural layer and an associated human burial, which, based on available evidence, is likely prehistoric/early historic Native-Hawaiian. Both the cultural layer and the burial are recommended for preservation through the establishment of an archaeological and burial preserve area. The approximate location and dimensions of this preserve area are plotted on Figures 5 and 21. The preserve area boundaries include all areas where the discontinuous cultural layer was encountered during the backhoe testing of the parcel, plus a fifty-foot buffer. The preserve area covers an area of approximately 8250 m² (88,760 ft²). Two mitigation steps will be required to establish this preserve area.

Feature 50-30-9-792A, the cultural layer, will require the preparation of a preservation plan. The cultural layer is recommended for preservation for future archaeological research. The preservation plan will outline the short-term and long term preservation measures that will safeguard the feature from damage during project construction and subsequent land use. Recommended short term preservation measures include:

- 1) a preconstruction meeting with the project construction personnel to make them aware of the location and significance of the preserve area;
- 2) surveying the preserve area boundaries by professional land surveyors so the

correct dimensions of the preserve area can be plotted on all project development maps. No construction or other land disturbance should take place within this preserve area; and

- 3) the erection of temporary 4-foot high plastic event fencing during construction along the preserve area boundary to make the boundary highly visible to machine operators. This fencing can be removed once construction is completed.

Long term preservation measures should protect the site for future research. These include keeping the preserve area free of ground disturbance such as construction, excavation, or major landscaping, such as tree planting. Simple landscaping, such as a grass lawn, should be installed to cover and protect it from erosion and pedestrian traffic. Once adequately protected by a lawn covering the preserve area need not be closed off from public access. No fencing or other demarcation of the preserve area is recommended, as this will only draw undue attention to the area.

Feature 50-30-9-792B, the human burial, is recommended for preservation in place within the combination archaeological and burial preserve area. The preservation of the burial will require the preparation of a burial treatment plan. As a previously recorded burial site (60 designated because it was found during inventory survey investigations) the mitigation and treatment of these skeletal remains fall under the jurisdiction of the Kauai Island Burial Council, who must approve all mitigation and/or treatment measures. The request for preservation in place must be presented to the Burial Council in the form of the burial treatment plan. The requirements for a burial treatment plan are clearly outlined in Chapter 13-300, Hawai'i Administrative Rules "Rules of Practice and Procedure Relating to Burial Sites and Human Remains". Along with other information the burial treatment plan must include:

- 1) Evidence of good faith search for lineal and cultural descendants, including legal advertising;
- 2) Names of known lineal or cultural descendants recommended by the SHPD Burials Program and recognized by the Burial Council; and
- 3) A description of proposed treatment of all burial sites including a statement of preservation in place or relocation. This should include both short and long term measures, which would be very similar to the measures given above for the archaeological site preservation plan.

Both the preservation plan and the burial treatment plan will have to be written, approved by SHPD (preservation plan) and the Kauai Island Burial Council (burial treatment plan), and implemented, before development of the parcel can begin.

Recommendation for Archaeological Monitoring

The proposed development of the project area will entail construction related grading and trenching. Subsurface testing results indicate that two site or feature types will potentially be found during ground disturbance: human burials and subsurface prehistoric cultural layers. These site/feature types are much more likely to be found in the project area's sand deposits along the coast. Accordingly, archaeological monitoring is recommended for all portions of the project area containing sand deposits. Before construction begins a monitoring plan should be written, approved by SHPD, and implemented.

Although only one burial was located in the project area during the backhoe testing, this cannot be taken as an indication that no other burials exist. Traditional-Hawaiian burials are common in coastal sandy deposits like those that make up the *makai* portion of the project area. There is a distinct possibility that additional burials will be found during project construction.

Although unlikely, there is the possibility that additional subsurface prehistoric cultural deposits will be located in the project area during construction. It is therefore recommended that the monitoring plan include provisions for the documentation of inadvertently discovered prehistoric cultural deposits. Documentation of features should include plotting their location on the overall project area map, profile drawings, descriptions of their stratigraphic context, descriptions of the feature's contents, and, if possible, samples for radiocarbon dating analysis. The monitoring plan should contain provisions for the analysis of these samples, if they are encountered. If available this information would provide better understanding of the prehistoric coastal occupation in the region.

In consultation with DLNR/SHPD and the Kauai Island Burial Council it may be possible to combine the burial treatment and preservation plans for Site 60-30-9-792 with the monitoring plan for the entire parcel into a comprehensive historic preservation mitigation document. The preparation of one overall mitigation document would presumably be more cost effective for the client.

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APPENDICES

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APPENDIX 2

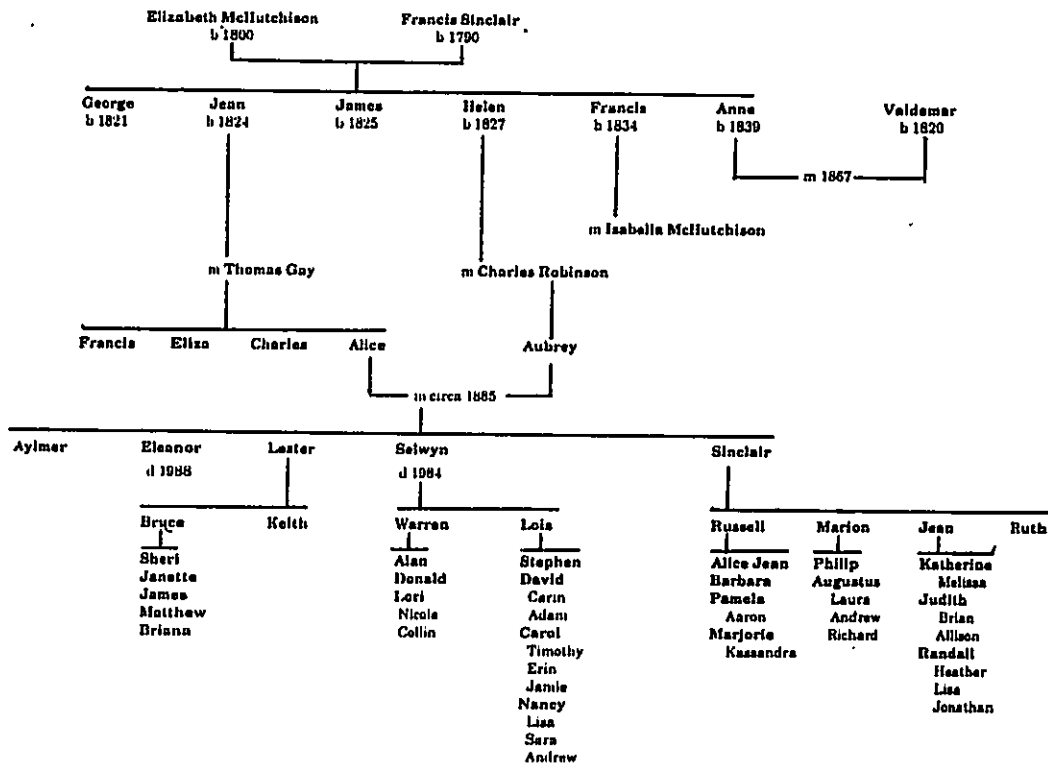
TABLE 1

State Sites Recorded in and Around Waimea Town

State Site Number	Function	Report
50-30-05-3244	Mostly Individual Burials	Cox 1975
50-30-05-3245		Cox 1975
50-30-05-3246		Cox 1975
50-30-05-3250		Cox 1975
50-30-05-3251		Cox 1975
50-30-05-3252		Cox 1975
50-30-05-3253		Cox 1975
50-30-05-3254		Cox 1975
50-30-05-3255		Cox 1975
50-30-05-3256		Cox 1975
50-30-09-26	Ditch Burial	Kikuchi 1983
50-30-09-1870		Kikuchi 1983
50-30-06-498	Burials, Walls, Enclosures, Platforms	McMahon 1993
50-30-05-1853	Grave Sites	Sinoto 1993
50-30-05-1854		Sinoto 1993
50-30-05-4012	Cultural Layer and Burial	Hammatt 1993
50-30-05-636	Historic Cave Burials	Hammatt 1993
50-30-05-637		Hammatt 1993

APPENDIX 1

Sinclair-Robinson-Gay Family Genealogy



APPENDIX 3

Coring at Kekupua Fishpond

PRELIMINARY INVESTIGATIONS AT KEKUPUA POND,

MAKAWELLI, KAUAI

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On 29 May, 1999, the investigators visited Kekupua Pond near Makaweli at the invitation of the landowner, Warren Robinson. The intent was to make a preliminary evaluation of the pond on the site, said to be a prehistoric fishpond, for paleoecological research. This was part of an ongoing archaeological, historical, and ethnographic study of the property by Dr. Hallett Hamman, of Cultural Surveys Hawaii, and his staff in connection with a development proposal.

Physical Description and Limnology

Kekupua Pond (21° 56' 46" N / 159° 39' 14" W) is a small shallow body of fresh water on the SW coast of Kauai at Kapalawai, between Makaweli and Waimea. It is classified as a *pu'ione* type pond. A *pu'ione* is created by the formation of a barrier sand dune that isolates the pond from the sea. This is a very common type of pond in the coastal zone of the major islands in the Hawaiian chain. On Kauai, this is the type of pond most frequently used as a fishpond or taro pond. Most *pu'ione* have freshwater spring sources, a feature which converts them into an almost freshwater pool termed *loko-wai*. Because of their fresh waters, the inland portions of such ponds were usually partitioned into taro growing areas.

Shaped like an elongate triangle, Kekupua measures ca. 240 m by 100 m. A causeway of earth and stone separates a small section from the main pond. The pond is shallow (generally <1m), and most of its surface is covered by sedges, grasses, and the highly invasive water-hyacinth (*Eichornia crassipes*). A small ditch drains seaward from the pond. A water-grate, which has been remade into a concrete channel and gate-way, exists on this SW end. Low dunes separate the pond from the ocean. The waters of

Kekupua are fresh to very slightly brackish: at noon on 29 May, the specific conductance was 805 $\mu\text{m cm}^{-1}$ and five hours later, 830. The water's pH is neutral to slightly alkaline, measuring 7.6 and 7.5 at these times. Temperatures and oxygen levels of the surface waters were 23.6°C and 24.1°C, and 8.25 and 8.0 mg/l at noon and 5 pm respectively.

Informants attest to the presence of at least three springs. Two were called Kahe and Kekupua; the name of the third is unknown, although it may have been Kinari'i. Informants also say that the fishpond had a *mo'ō*, or waterspirit-demi-goddess, the caretaker of the watery environment. A large rock stands in the water at the SW side of the pond. This is where the *mo'ō* sat and combed her hair, it is said. Her name is not recorded, but may have been the same as that of the pond.

Only the central portion of the pond has > 1m of soft sediment. Probing showed that other areas, including the NE end and accessible points along the NW side, had only 30-100 cm of soft mud overlying rock. On the SW end, a similarly thin layer of mud overlies sand and gravel. The causeway that nearly cuts off a section of the pond stands several feet high and is about 2 m wide at the top. It runs across the pond in a *mauka-makāi* direction but does not connect to the pond's outer edges. This man-made structure is very unusual because of its size and reputed function, i.e., to isolate one end of the pond to provide safety for the young mullet spawn. Intimated by the size of the mound is the presence of an internal stone wall, repeatedly built up by dredging of the pond. The mound is far too big and tall for the simple function of separating the young fish from the main pond. All sides of this mound are faced with stones. The entire perimeter of the pond is also apparently faced with stone. This facing, standing ca. 1 meter high, is now

set back from the water's edge. Excavations at these points may show that the stone facing was the edge of the original pond.

Stratigraphy

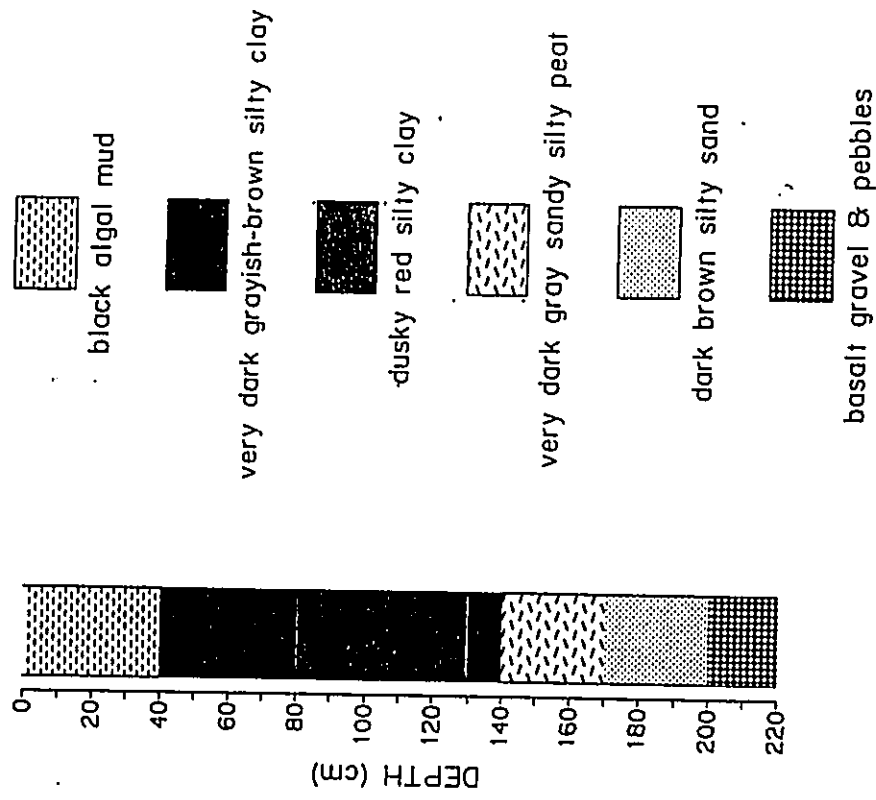
The thickest deposit of soft sediment found, ca. 220 cm, was located by probing near the center of the pond. The accompanying figure shows the lithology of this site, which was covered by ca. 10 cm of water at the time of coring. Sediment was recovered in contiguous sections of about 30 cm each using a 7.5 cm-diameter hand-driven bucket auger. Sediments were described in the field, subsamples were collected in airtight plastic bags, and sediment smears were examined by light microscopy at 400X in the Paleocology Laboratory of the Dept. of Biological Sciences at Fordham University. Munsell colors were recorded in wet condition.

From 0-40 cm below the sediment surface, the coring site (KEK-3) yielded black (N 2/0) algal mud. This material contains an abundant and diverse diatom assemblage, including species in the genera *Mitschlia*, *Melosira*, *Pinnularia*, and *Fragilaria*. Plant fibers, fungus spores, and pollen (particularly grasses and sedges) are present.

At ca. 40 cm, the sediment changes to a very dark grayish-brown (10YR 3/2) silty clay. Diatoms are less abundant and not so well-preserved, and organic material in general is scarcer. This silty clay changes gradually at ca. 80 cm to a dusky red (2.5YR 3/2) with fewer coarse clastics and a noticeable increase in charcoal. Sand grains increase in the silty clay at ca. 130 cm, where the color darkens again to very dark grayish-brown (10YR 3/2). This material is more humic than the clay layers above it.

From 140-170 cm, the sediment is a very dark gray (10YR 3/1) sandy silty peat with large pieces of plant fiber and leaf tissue. A "key" (drupe) from a hala fruit

LITHOLOGY OF KEK-3 CORE FROM KEKUPUA POND



(*Panzemus tectorius*) was extracted from the zone of contact between this unit and the one described below.

At ca. 170 cm, the sediment changes abruptly to a dark brown (10YR 3/3) silty sand containing large centric diatoms, sponge spicules, and foraminiferan tests of probable marine origin. Some wood-derived charcoal particles are present at this level. This sand layer coarsens downwards, becoming gravelly at ca. 200 cm. Stones to 5 cm diameter were recovered from the base of the section, at 220 cm. These were subrounded vesicular basalt.

Proposed Future Investigations and Provisional Interpretation

We hesitate to make more than the most provisional paleoecological reconstruction for the site without ¹⁴C dating and pollen analysis. The hula key retrieved from the top of the basal sand layer has been submitted for ¹⁴C dating in order to establish a maximum age for the pond. Pollen samples are currently being processed for analysis, and their contents should provide clues to the age of the sediment layers based on comparison to the regional chronology being developed by the investigators from other sites on the island. The organic-rich nature of most of the layers would make it feasible to assemble a complete chronology from radiocarbon dating and intercorrelation with the other studies in progress.

It would appear that the site may have been a shallow natural basin prior to modification by prehistoric Hawaiians. Initially it appears to have experienced marine overwash, followed by a freshwater swamp-forest stage. The overlying clay layers suggest a subsequent period of erosion, perhaps from cultivation of the adjacent banks. Whether this was in prehistoric times or post-European contact cannot be determined

from the evidence presented, but the additional investigations proposed above could almost certainly resolve this question. Following this erosional phase, the pond has reverted to organic sedimentation, probably reflecting the overgrowth of the pond with aquatic vegetation in recent decades. It would appear from the thin mantle of sediments in all areas probed except the pond center that, when the pond was in use for aquaculture and later, irrigation, some small-scale dredging took place. This notion is supported by oral sources.

In conclusion, Kekupua Pond is a valuable source of information concerning the past environments and lifeways of the area. More information could be recovered from the materials collected through radiocarbon dating and pollen analysis, and this work will probably be undertaken as part of our ongoing studies of the paleoecology of Kauai. Kekupua also has great potential if it is restored as a fishpond. The shallow depth of the underlying sediments, the apparent solid rock base, and the freshwater springs insure that the pond is continually flushed seaward. The current presence of mullet and tilapia in the pond attests to its continued viability for this purpose.

Acknowledgements

We thank the Robinson family and Dr. Hallett Hammatt for inviting us to examine Kekupua Pond. Field investigations were assisted by Ka'ohulani McGuire, Lida Pigott Burney, Dolly Kikuchi, and Kristina Kikuchi-Palenapa. Our work on Kauai paleoecology is supported by Kauai Community College, the Smithsonian Institution, National Science Foundation grant DEB9707260, and National Oceanic and Atmospheric Administration grant NA46GP0465.

APPENDIX 4

Photos



Figure 45 Bull in project area.



Figure 46 Photo showing dirt road, vegetation, and cleared areas.



Figure 47 Patches of vegetation in project area.



Figure 48 Patches of vegetation in project area.



Figure 49 Photo of whaling iron try-pot.



Figure 50 Dense vegetation behind shoreline.

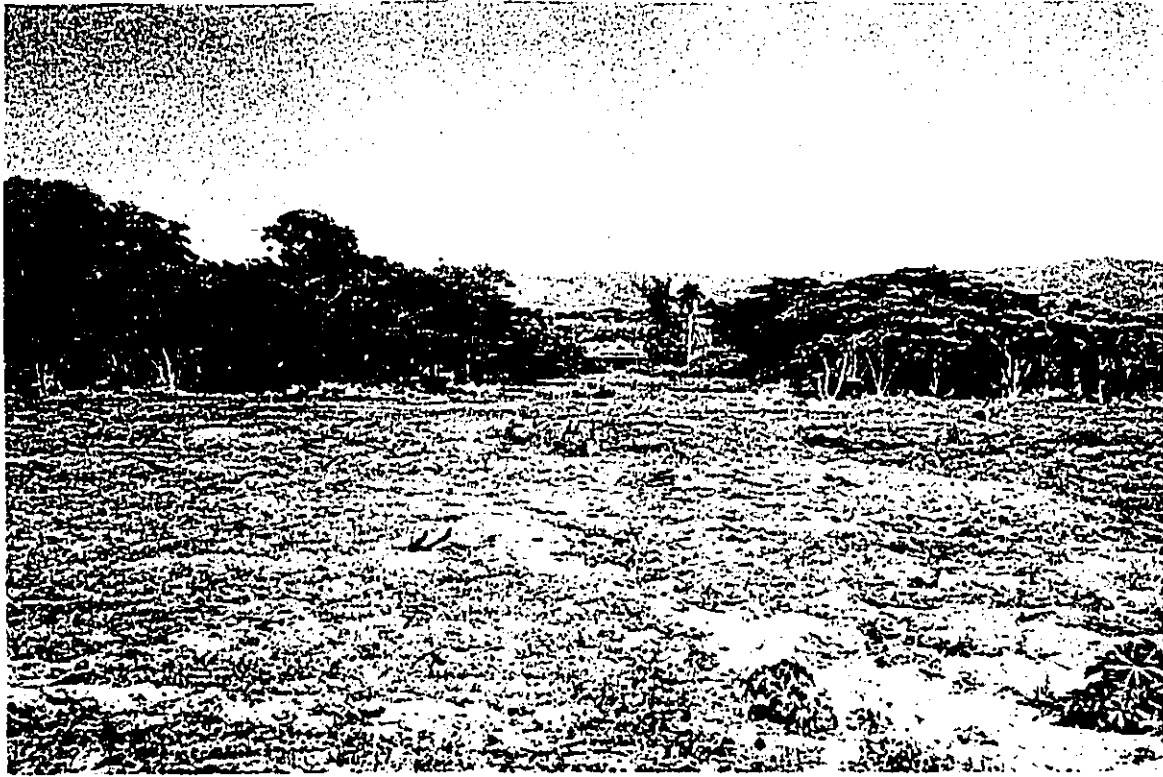


Figure 51 Photo taken from beach to main house showing clear line of sight.

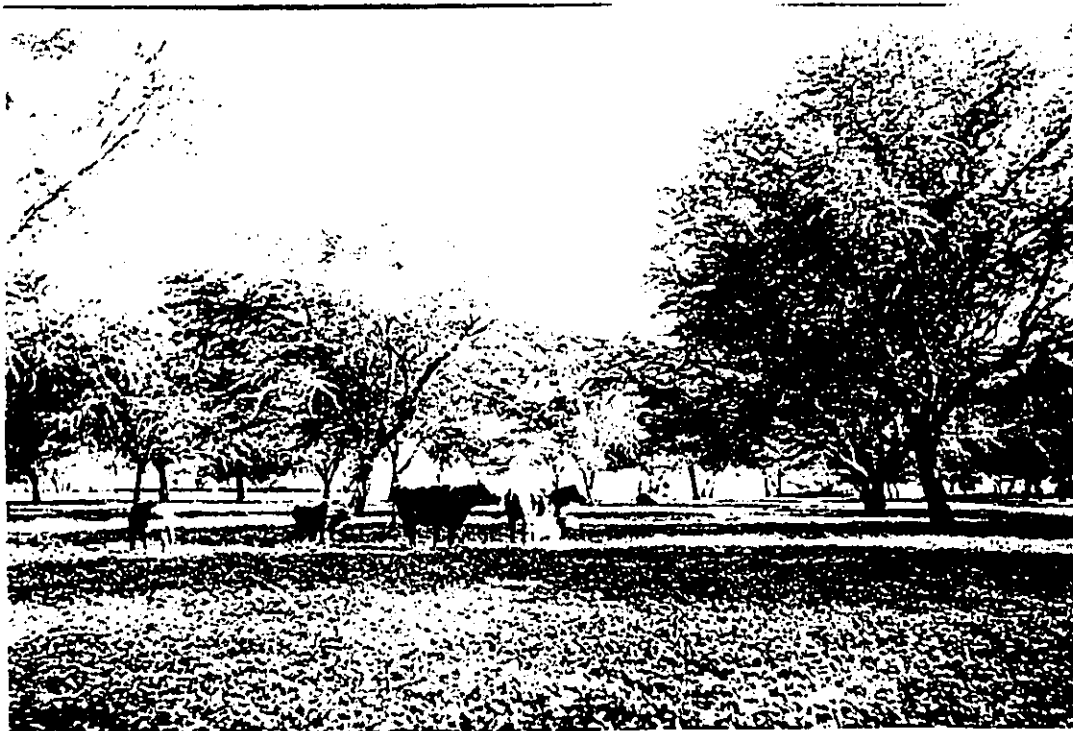


Figure 52 Cattle in project area in early 1900's. Note lower branches of trees cut.



Figure 53 Workers camp houses.



Figure 54 Modern *lo'i* in workers camp.

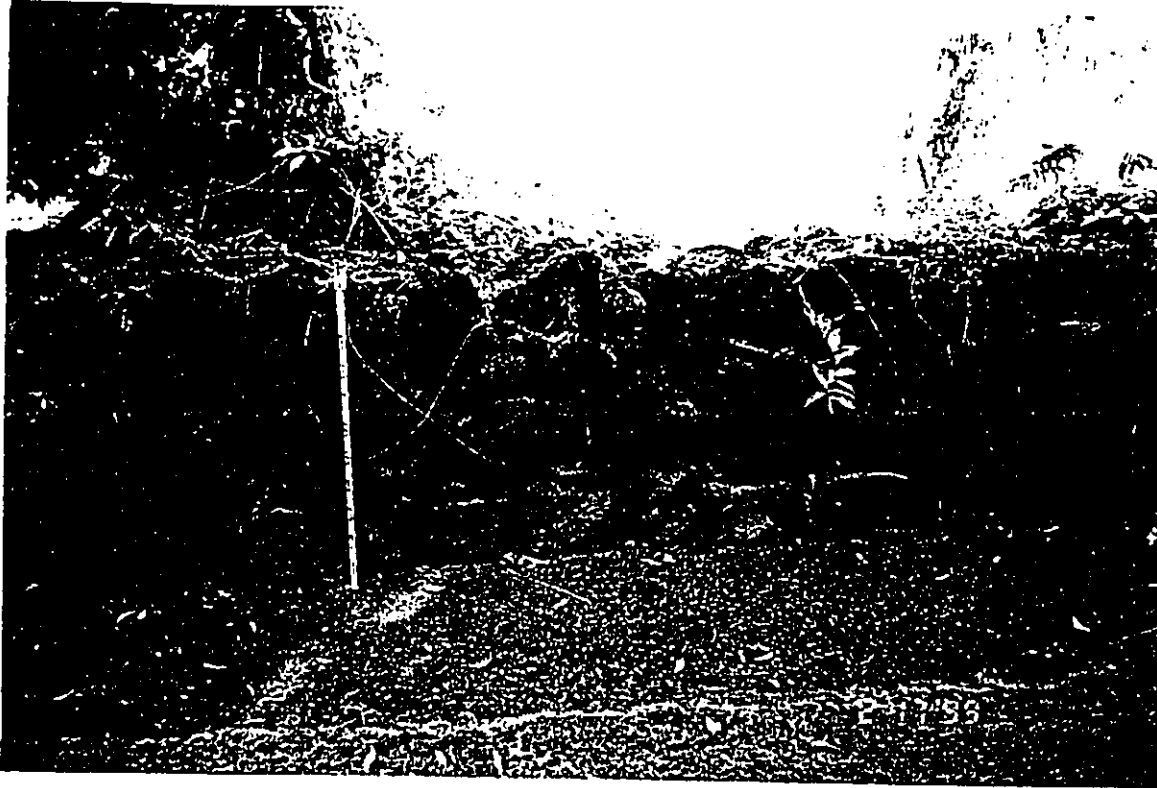


Figure 55 Site 50-30-9-762/A: Wall lining driveway on Waimea side. View to west.

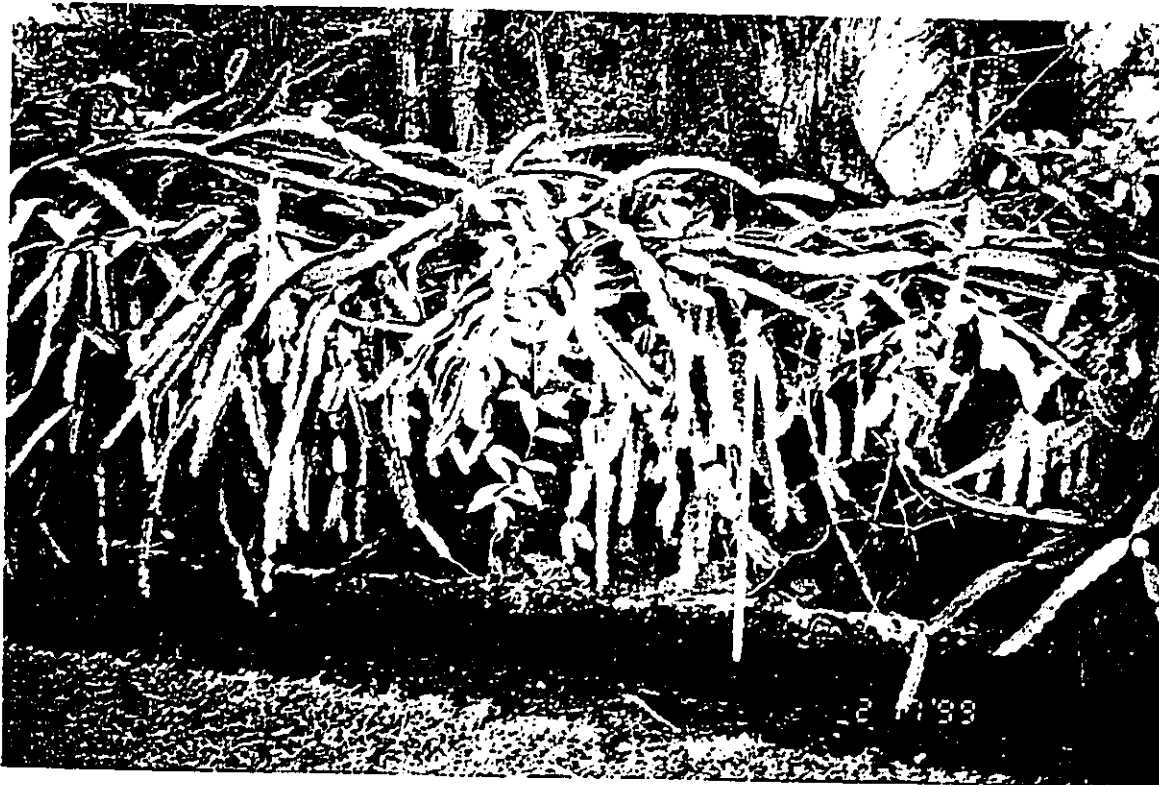


Figure 56 Site 50-30-9-762/B: Wall lining driveway on Hanapēpē side. View to east

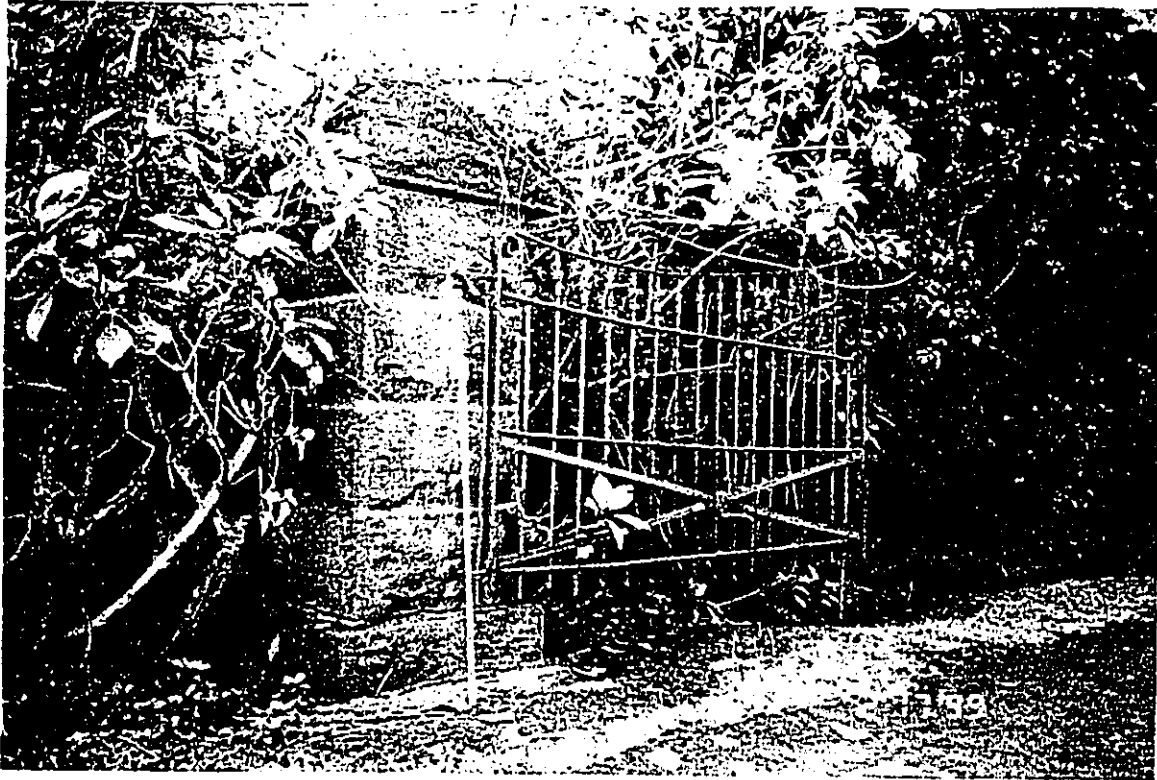


Figure 57 Photo of rock column at front gate.



Figure 58 Front gate rock column showing cut stone detail.

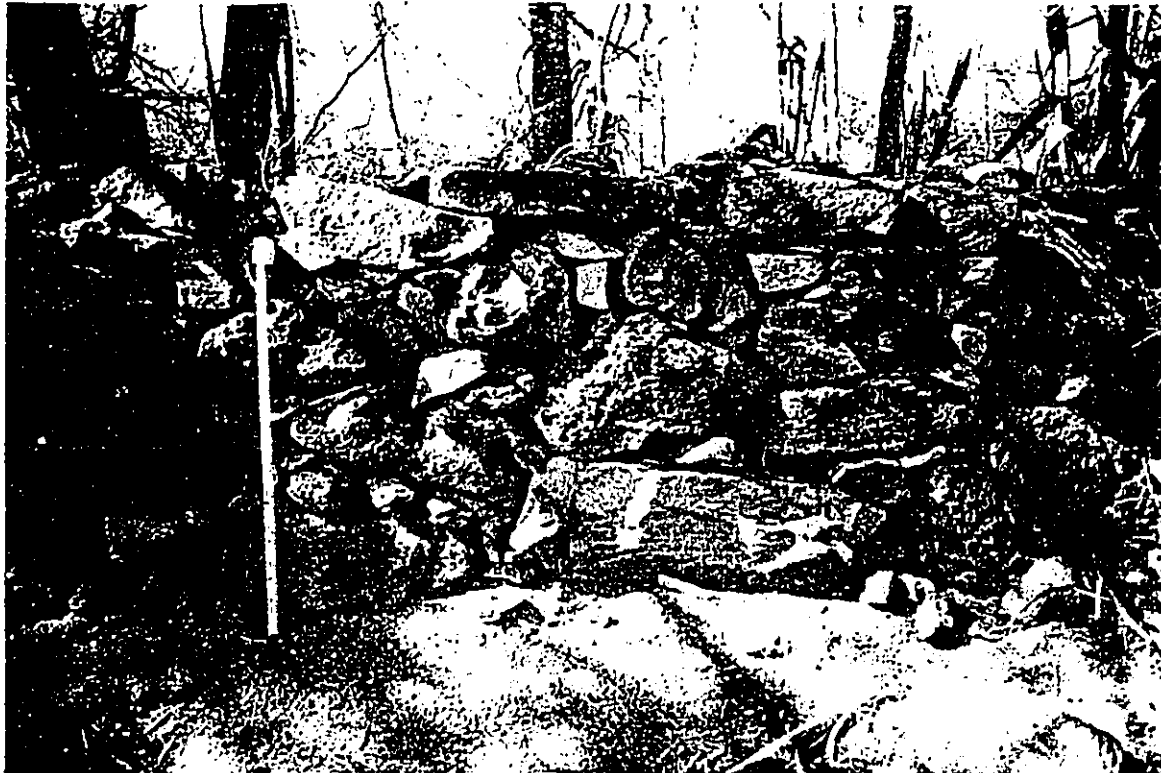


Figure 59 Site 50-30-9-762/C: Photo of northern project area boundary wall.



Figure 60 Site 50-30-9-762/D: Photo of project area boundary wall. View to west.



Figure 61 Site 50-30-9-762/E: A section of rock walls within workers camp.



Figure 62 Site 50-30-9-762/F: Photo of rock terrace. View to west.



Figure 63 Site 50-30-9-763: Platform showing ridge with paved depressions. View N.



Figure 64 Site 50-30-9-763: Length of paved depression on top of platform. Center ridge on left side of photo. View to north.



Figure 66 Site 50-30-9-763: Profile of mound on surface of platform. View to east.



Figure 65 Site 50-30-9-763: West side of platform abuts project area boundary wall



Figure 67 Site 50-30-9-764/A: Photo of front of main house. View to northeast.

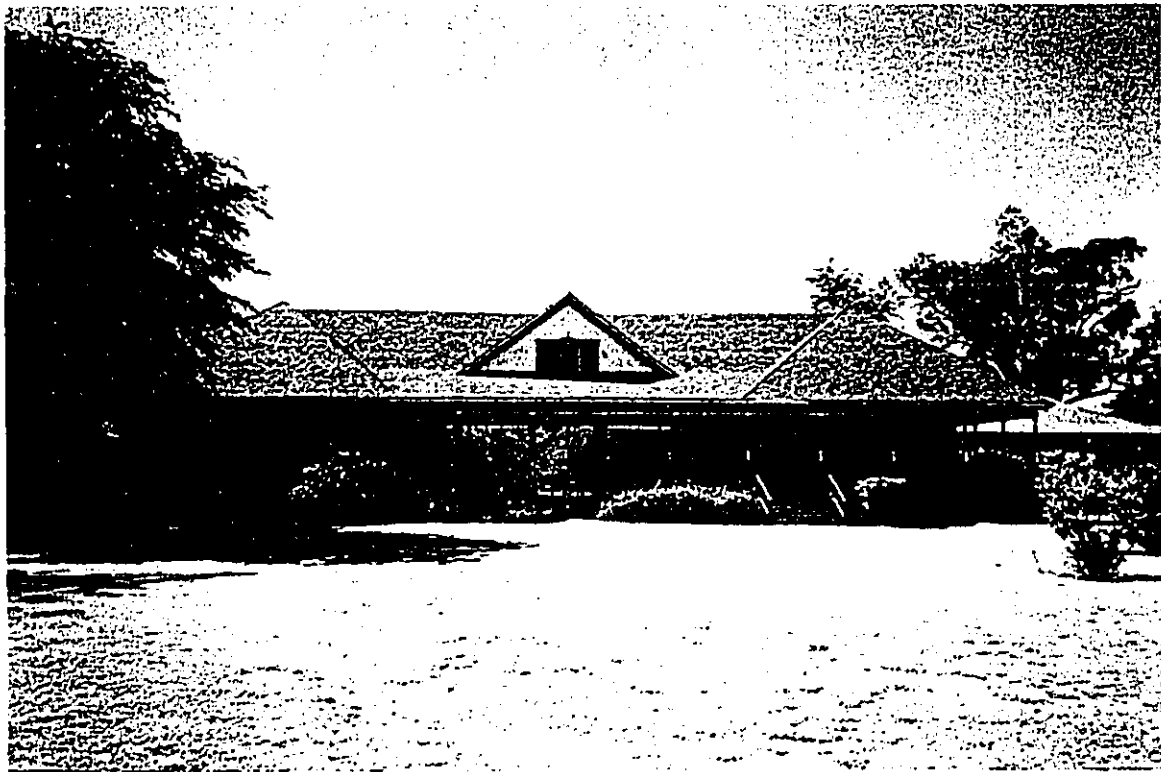


Figure 68 Site 50-30-9-764/A: Photo of back of main house.

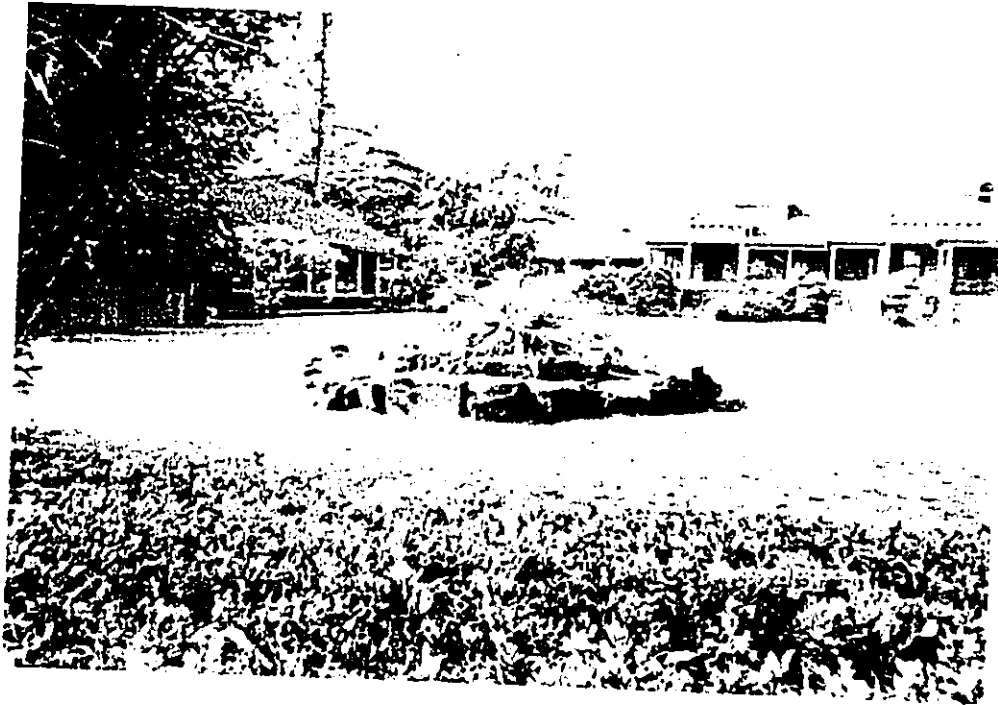


Figure 69 Cut block in modern terraced garden

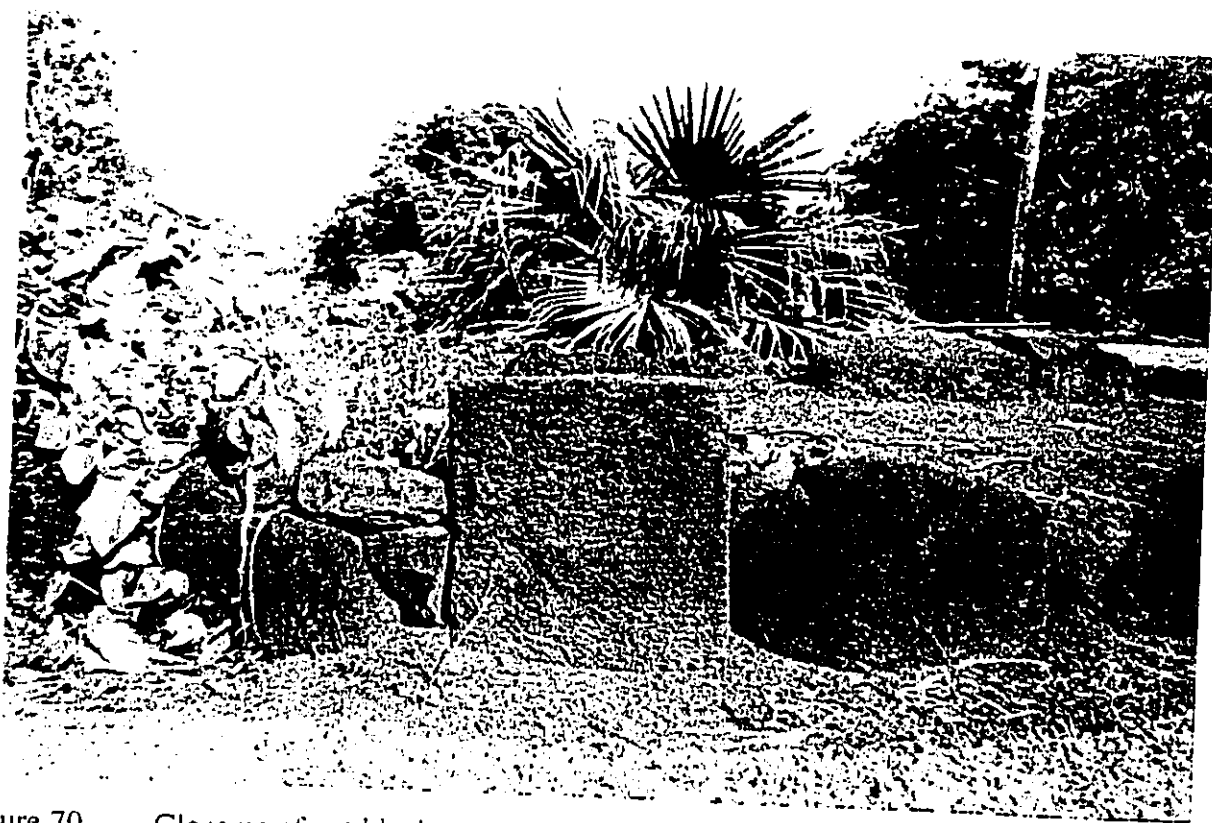


Figure 70 Close up of cut block



Figure 71 Site 50-30-9-764/B: Photo of guest house. View to northwest.



Figure 72 Site 50-30-9-764/C: Photo of servants quarters. View to southeast.

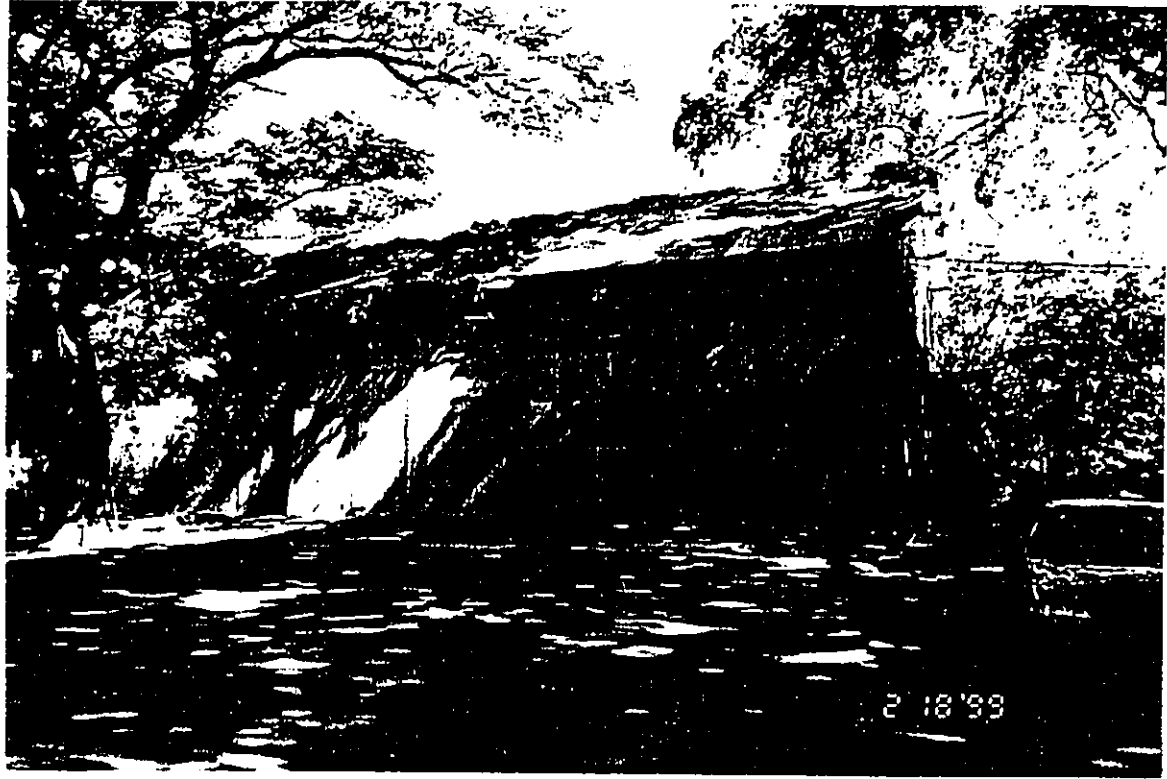


Figure 74 Site 50-30-9-764/D: The carriage house. Part of main house complex.



Figure 73 Site 50-30-9-764/E: Saddle house remnants.



Figure 75 Site 50-30-9-764/F: Exterior of plant house.



Figure 76 Site 50-30-9-764/F: Interior of plant house with excavated floor.



Figure 77 Site 50-30-9-765: Area of fishpond with cattle disturbance. View to west.



Figure 78 Site 50-30-9-765: North end of island wall showing height and structure. View to south.



Figure 80 Site 50-30-9-765: Concrete gate at southwest corner of pond. View west



Figure 79 Site 50-30-9-765: Photo showing pump house, vegetation, and high wall construction around pond. View to north northwest.



Figure 81 Site 50-30-9-765: View from north to south shore showing vegetation.



Figure 82 Site 50-30-9-765: Photo looking across fishpond to west. Small island is visible. The row of coconut trees represents the island wall.



Figure 84 Site 50-30-9-766: Front of Portuguese oven.

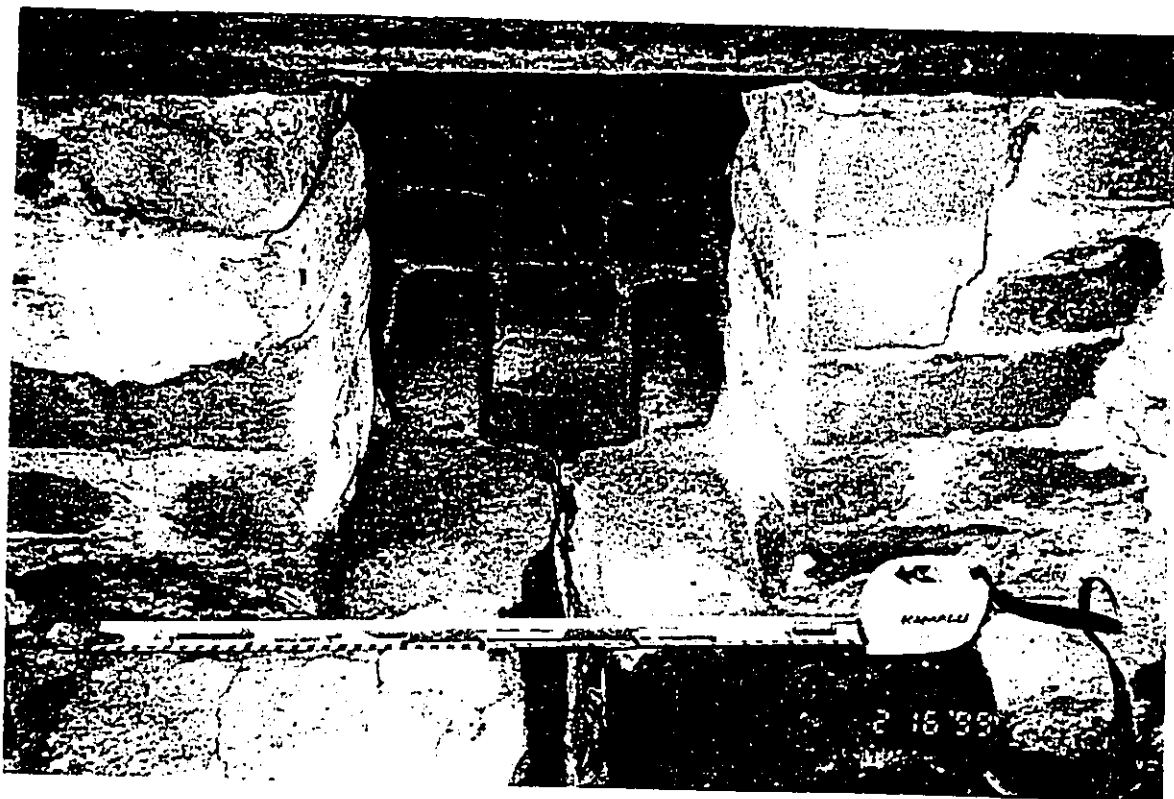


Figure 83 Site 50-30-9-766: Photo showing mouth for ash removal.



Figure 85 Shot west-southwest of historic material *in situ*, stratum II, Trench 10.

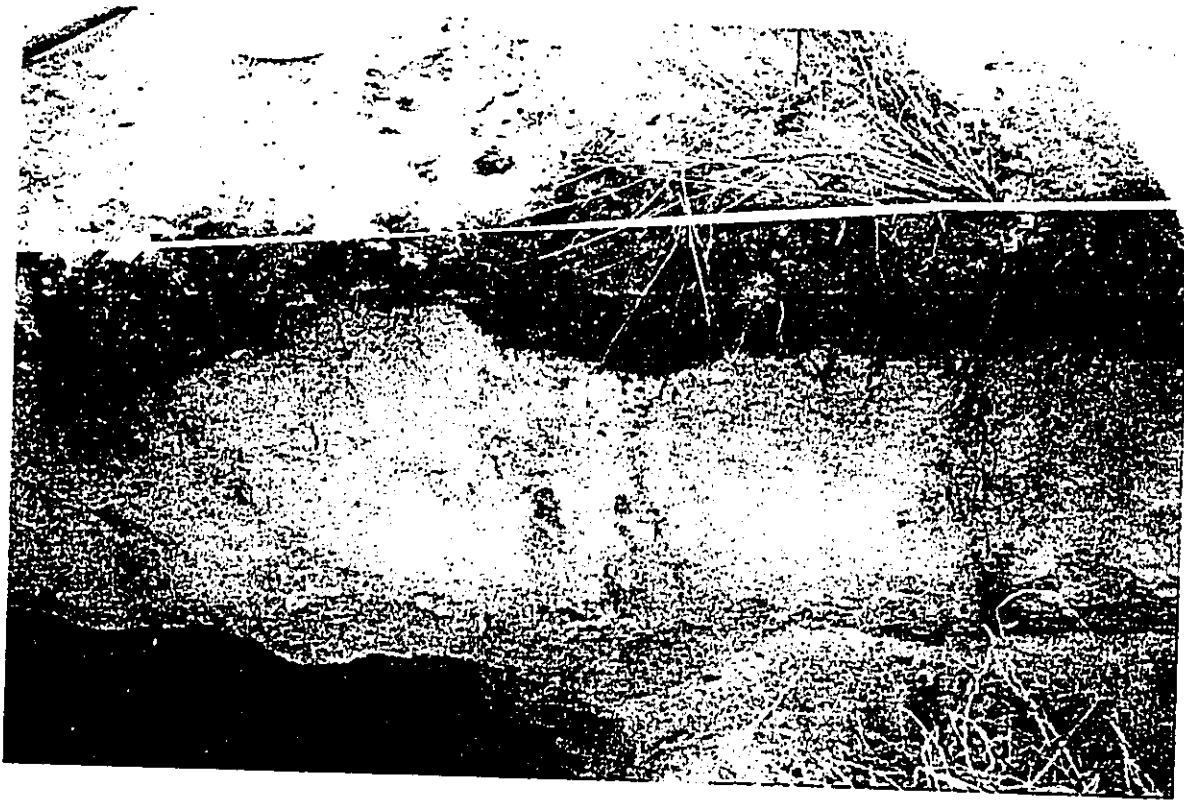


Figure 86 Shot east of Feature 1 (on left) and stratum II, Trench 3. Historic sandy loam overlies stratum II--the buried A-horizon.



Figure 88 Trench 8. showing historic/modern introduced clay loam sediment overlying calcareous beach sand deposits.

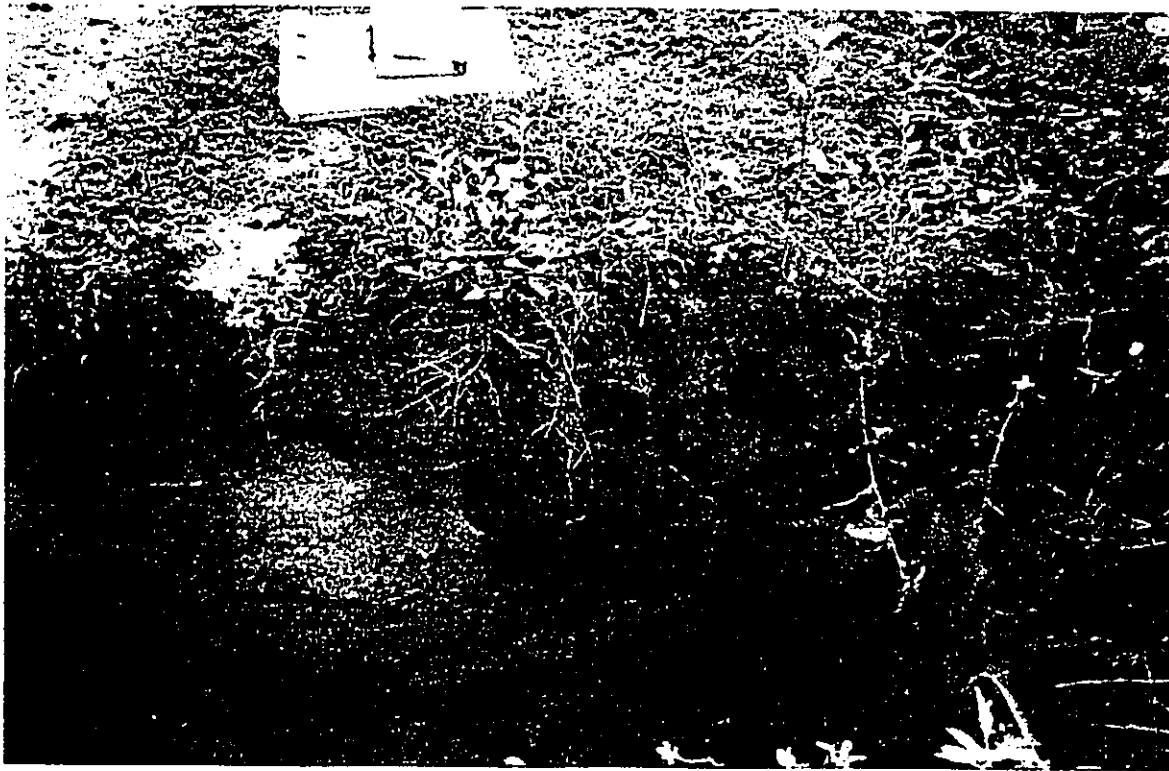


Figure 87 Trench 7. showing charcoal flecking in Feature 1. Red-brown clay-loam sediments above calcareous sand are historic/modern introductions.



Figure 89 Trench 5, showing Features 4 (on left), 5, and 6 of State site # 50-30-09-792/A--traditional-Hawaiian cultural layer.



Figure 90 Trench 14, showing Feature 2 (northwest profile) of State site # 50-30-09-792/A--traditional-Hawaiian cultural layer.

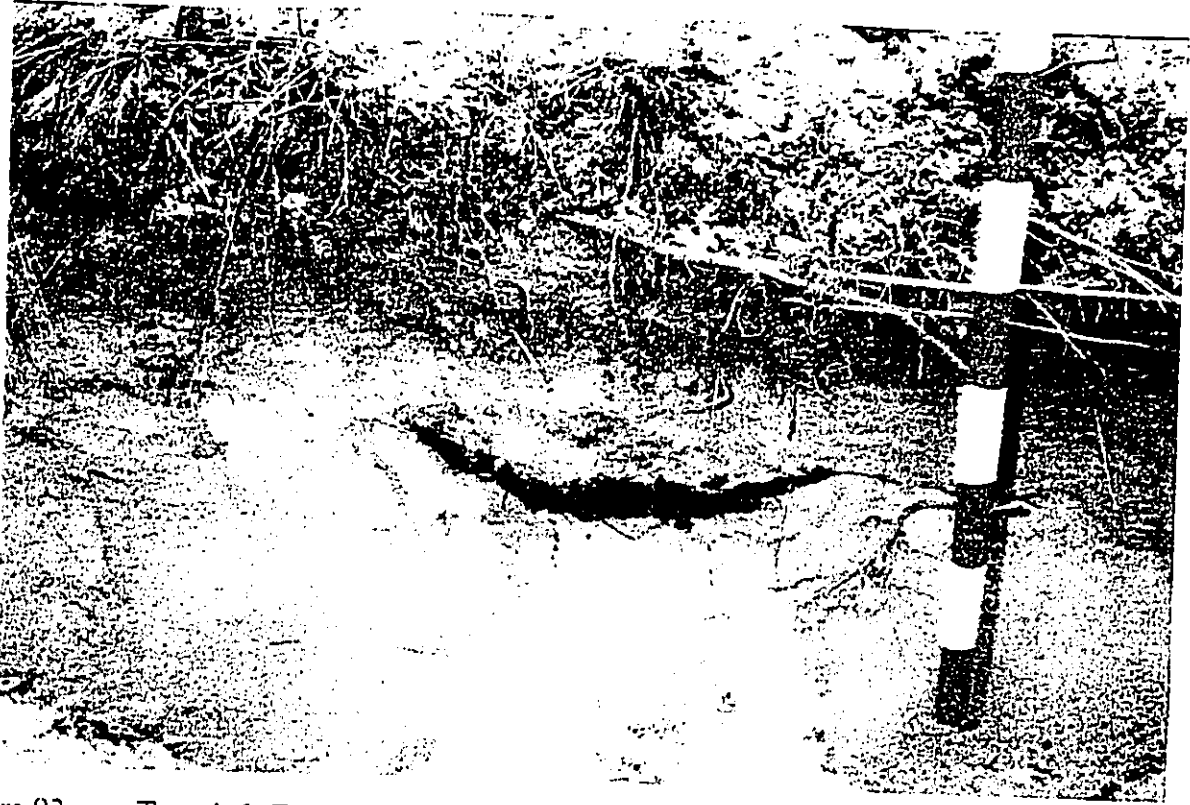


Figure 92 Trench 6. Feature 1. probable *imu*-style earth-oven, prior to sampling.

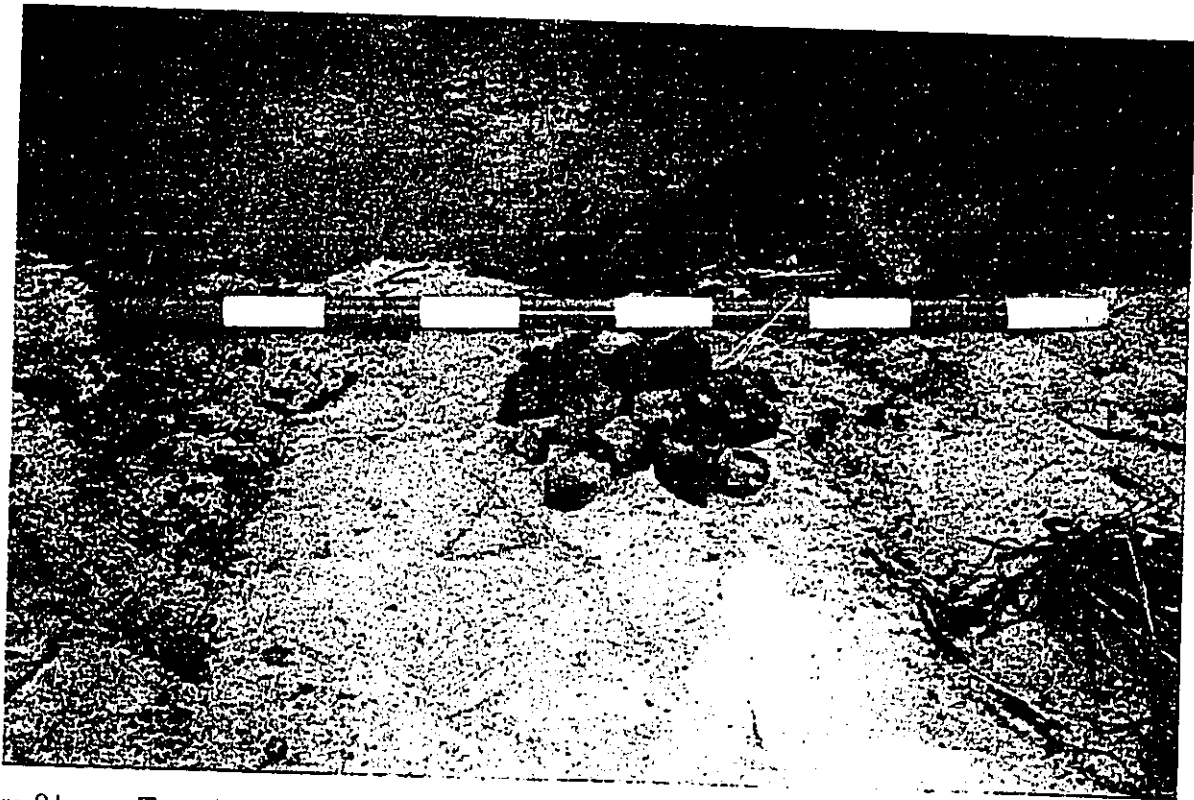


Figure 91 Trench 6. Feature 2. probable *imu*-style earth-oven, showing the concentration of fist-sized basalt cobbles recovered during excavation of this feature.

ARTIFACT & MIDDEN CATALOG

Cultural Surveys Hawaii
Project: Kapalawai Inventory Survey (Kapa 10)

Trench	Tr 3	Tr 5	Tr 5	Tr 5	Tr 5	Tr 5	Tr 7	Tr 7	Tr 10	Tr 14	Tr 14	Total
Stratum												
Depth (cm)												
Feature												
Conus sp.							0.3			0.3		
Theodoxus sp.	0.1											
Terebra sp.	3.5				0.3		1.5					
Turbo sandvicensis	0.7											
Brachidontes crebristriatus	0.1			0.5			1.5	5.3			1.1	
Pinctada radiata										0.7	1.1	
Water-rounded marine shell			44.9	41.2								
Misc./Unidentified shell	0.7						0.2			0.4		
Total marine shell	5.1	0	44.9	41.7	0.3	0	3.3	5.5	0	1.4	2.2	104.4
Echinoderm	0.2				0.8		0.3	0.3		0.1	0.1	
Fish bone			0.1									
Total Charcoal	6	6.7*	25.9	24.3	3.3	6.5*	7.7	11.1	3.8	3.6	6.4	
Total Unident. Mammal Bone	1.3	0.5 (burnt)		1.4	8.8					0.2 (burnt)	2.5	
Total midden	12.6	7.2	70.9	67.4	13.2	6.5	11.3	16.9	3.8	5.3	11.2	276.1
Volcanic Glass Flakes (# of Pieces)				1								
Basalt Flakes (# of Pieces)		2								2	1	
Medicine Bottle									1 (broken)			
Glass Fragments									1			
Rusted Nail									3			

*Charcoal Samples Sent to Beta Analytic

APPENDIX 6

Radiocarbon Dating Results

Three samples were sent for radiocarbon dating analysis from the inventory survey. The first sample, consisting of a "key" or drupe of the *hala* plant (*Pandanus tectorius*), was collected from the basal layers of sediments in Kekupua Pond. This sample is discussed in Appendix 3 and on pages 61 and 62 "Coring and Dating at Kekupua Pond" of this volume, see above.

Beta Analytic #	Sample Size	Depth	Measured C14 Range	C13/C12 Ratio	Conventional C14 Age
132384	2.2 g (0.5 g carbon)	170 cm bs	980 +/- 80 BP	-25.6 ‰	980 +/- 80

The two sigma (95 % probability) calibrated calendar age for the sample from the Kekupua Pond sample is AD 895 to 1225, after calibration with the Oxcal software, see print out below. The significance of this date has already been discussed in Appendix 3 and pages 61 and 62.

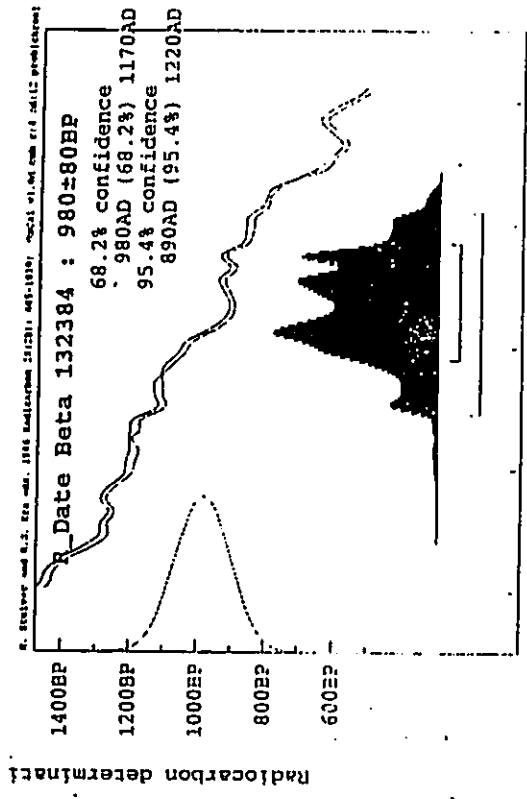
The remaining two samples were collected from the traditional-Hawaiian cultural layer that constitutes Site 50-30-09-792. Each sample consisted of diffuse charcoal particles collected from discrete features located in the cultural layer. The samples were from Trench 5, stratum II, Features 1 and 6. The box below summarizes the radiocarbon dating results supplied by Beta Analytic, Inc.

Beta Analytic #	Sample Size	Provenience	Measured C14 Range	C13/C12 Ratio	Conventional C14 Age
139725 (CSH ID# Kapa10a)	1.9 g charcoal (0.8 g final carbon)	Tr. 5/Str. II Fe. 6/30-60 cmbs	280 +/- 100 BP	-24.3 ‰	290 +/- 100 BP
139726 (CSH ID# Kapa10b)	1.3 g charcoal (0.6 g final carbon)	Tr. 5/Str. II Fe. 1/30-50 cmbs	180 +/- 130 BP	-24.0 ‰	200 +/- 130 BP

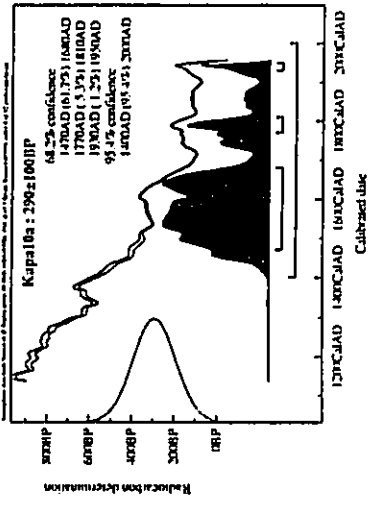
Both samples were calibrated into calendar ages using the Oxcal Calibration Program (Version 3.3). The Oxcal calibration result printouts are included in the subsequent pages. Both calibrated calendar ages were broad at the 2 sigma (95 % probability) confidence level, ranging from the 15th to the 20th century. Sample 139725 (CSH ID# Kapa10a) yielded a calendar age rang of 1400 to 2000 AD. Sample 139726 (CSH ID# Kapa10b) yielded a calendar age rang of 1480 to 1960 AD. These broad age ranges are often the case from samples consisting of diffuse charcoal particles not collected from a specific combustion feature. Unfortunately, these were the only types of samples that were available from the

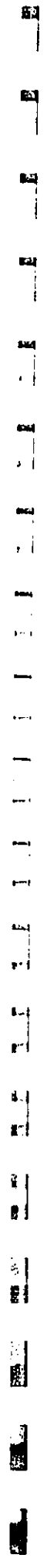
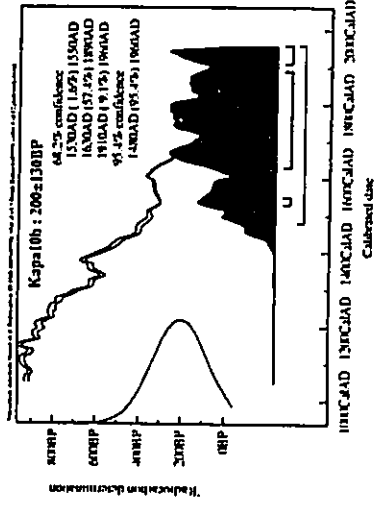
exposed features of Site 50-30-09-792.

The appearance and artifact and midden content of cultural layer 50-30-09-792 indicate the cultural deposit is traditional-Hawaiian (pre-contact and/or early contact in age). Although the two radiocarbon dates from this layer are not conclusive regarding the age of the layer, in light of the context, the dates are generally corroborative of the pre-contact age of the deposit.



R_Date Beta 132384 : 980±80BP
 68.2% confidence
 980AD (68.2%) 1170AD
 95.4% confidence
 890AD (95.4%) 1220AD







E

ARCHITECTURAL ANALYSIS
OF STRUCTURES
AT KAPALAWAI
MASON ARCHITECTS

ARCHITECTURAL ANALYSIS OF STRUCTURES AT KAPALAWAI

Prepared for Helber, Hastert & Fee

July 1999
(revised February 2000)

Prepared by
Mason Architects, Inc.

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PART 1 - INTRODUCTION

The Robinson house at Makaweli, near Waimea on the island of Kauai, was constructed in c. 1897, and was designed by architects C.B. Ripley and Arthur Reynolds for Aubrey Robinson. The house has remained in the Robinson family since its construction. It sits on a parcel of land defined by agricultural fields on the northwest, Kaunualii Highway on the northeast, and the ocean to the south. On that property are the main house structure, ancillary buildings, several smaller houses, and an inland fishpond. The main house includes an original attached kitchen building, and an attached bedroom wing addition.

Mason Architects, Inc., is working with Helber Hastert and Fee for Destination Villages LLC to create planning and design for a new resort at the site. This historic structures report was prepared as part of the background research and analysis for the preparation of an Environmental Impact Statement (EIS).

The general plan for the project at the main house complex is to develop the main house and attached kitchen and bedroom wings as a greeting space and as a museum, administration and meeting room area. At the main house the bedroom wings will be renovated to provide three meeting rooms, a bar, and mens' and womens' restrooms. Some interior walls will be removed in these areas. The library, sitting room, dining room, pantry, china room, linen room, guest room, and the original portion of the kitchen building will be restored and used in their current layout as museum spaces. Furniture and other items currently in the house will be kept in these spaces. The exterior of the house will be basically unaltered, and will generally receive only repairs to damaged materials.

The majority of the planned new construction for this project is located away from the existing structures. Existing buildings other than the main house will either be used in their current state, or will be restored to the original appearance at least on the exterior. The few buildings that are in very poor condition will be demolished.

PART 2 - SITE VISITS AND METHODOLOGY

On-site research of the house and site was conducted on November 17 and 18, 1998 by Glenn Mason, AIA, Marianne Cooper, John Fullmer, AIA, and Katharine Slocumb, AIA. Measurements and photographs were taken of the building and site, as well as observations of deterioration and damage of the building material. Additional observations and measurements were recorded by Katharine Slocumb, AIA on December 2, 1998. The entire main house structure, along with the attached kitchen and bedroom structures, were measured and compared with the original drawings for the buildings. New drawings of the building plans, elevations, and sections were produced on computer. Existing interior finishes and conditions of the room were recorded.

The field checks of additional buildings at the site included visual surveys of the buildings on two occasions. Architects Glenn Mason, AIA, and Katharine Slocumb, AIA, surveyed the buildings on November 18, 1998, and on July 1, 1999. Photographs were taken of the buildings, and notes and observations were made on the materials used, the condition of the buildings, and

the level of historic integrity. Historic photographs and maps owned by the Robinson family were checked to help determine the age of the structures.

An archaeological survey of the site was conducted by Cultural Surveys Hawaii in April 1999. This survey identified, and assigned site numbers to, all observed major man-made features on the site. The descriptions and significance analysis of these sites by Cultural Surveys Hawaii are listed in a separate report. The site numbers assigned by Cultural Surveys Hawaii to buildings at the site are also identified in this report.

PART 3 - SIGNIFICANCE CRITERIA

The significance of each structure was evaluated using the significance criteria defined by the National Register of Historic Places, which in title 36, part 60 of the Code of Federal Regulations (referred to as 36 CFR 60), defines the criteria for legally evaluating the significance of cultural resources:

Criteria: The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history.

PART 4 - DESCRIPTION OF SITE AND RECOMMENDATIONS

4.1 General

The site, approximately 170 acres of oceanfront property, contains the main house structure, three smaller buildings just west of the main house, and eight small houses further west, which are accessible from a separate dirt road from Kaunualii Highway (see Figure 9). An inland fishpond (photo 1) is located southeast of the house, near the center of the site. The pond area is quite lush, with many coconut palms, dense grasses along the pond edges, and plants covering much of the surface of the pond. Just southeast of the pond is Mataikona Stream, which runs the width of the site ending at the beach (photo 2) on the southwest side. It empties into the ocean only during periods of rain in the areas above the site, and appears to be stagnant at other times. The stream walls are rock-lined at the southwest end.

The site is covered with various vegetation, including Coconut and Date palms, Kiawe, Monkeypod, Ironwood, Eucalyptus, Milo, and Banyan trees, as well as night-blooming Cereus and Bamboo. An orchard area behind the main house contains mango trees and banana plants. Much of the site beyond the houses is currently covered with Bougainvillea and Kiawe thicket.

4.2 Site at Main House

The main house is surrounded by a large grass lawn. There are a few large trees immediately adjacent to the house, and many trees border the outer edge of the lawn. Tropical plants grow along the base of the perimeter of the house, including a thick hedge of Dwarf Rhapis (Bamboo Palm) (photo 3) at the south and west edges at the front of the house and at the kitchen area, and at the north side of the attached bedroom building. Ti plants grow at the main stair entry, and ginger grows along the east side of the house.

On the south side of the house at the edge of the lawn are two lava rock gate posts and a decorative wrought iron gate (photo 4). The fence surrounding the house area has sections of wire, wire mesh, and stones.

On the northwest side of the house is a fenced orchard or garden area with Ti plants and papaya, mango, and banana trees.

Recommendations:

1. *Plants more than 18" tall which are immediately adjacent to the buildings should be removed or trimmed so that they are at least three feet from the structure. Any plants growing on the building exterior walls or at the roof or gutter should be removed.*
2. *Trees growing adjacent to the structures should be trimmed so that no branches are hanging over the buildings.*

PART 5 - ARCHITECTURAL OBSERVATIONS OF MAIN HOUSE (Site 50-30-9-764, Feature A) AND RECOMMENDATIONS

5.1 Historical Information

The house was designed by architects C.B. Ripley and Arthur Reynolds for Aubrey Robinson. The plans are dated 1897.

An addition was made to the northwest side of the attached kitchen building sometime prior to 1930. This small addition was simply attached to the outer edge of the exterior lanai of the existing kitchen building. The fascia of the addition's flat roof butts up to the fascia of the hipped roof of the kitchen building. The addition was used as an employee dining room and for wood storage.

The attached bedroom wing was added as a boy's bedroom wing some time before 1920.

5.2 Exterior

5.2.1 Roof

Main House

The main house roof is a double-pitched hipped roof (photo 5), in the O-shape of the floor plan around the central courtyard (photo 6). The roof has many gables, including a large projecting gable out over the front entry. Large gables are also located at the center of the east and north (rear) sides, and there are gables on each side of the front corners of the building. The front central gable has a small window with decorative columns at each side and an arch above, and the two front corner gables have decorative scrollwork. The gable at the rear side has three double-hung windows; one is boarded up, and the sashes may be missing. Other gables have louvered vent openings. The large gables have shingle siding, some of which is scalloped. The shingles at the gables generally appear to be in good condition, but there are some areas where the shingles are deteriorated or need repainting.

The roofing is brown-red asphalt shingles. They appear to be in good condition. The original drawings do not indicate the original roofing type, but based on wood shingles visible from inside the roof, the roof was originally wood shingle.

The eaves are closed all around the building. The eaves below and above the three gables at the front elevation of the building, which are above the three stairs leading to the front lanai, have decorative brackets. Portions of the fascia are missing at the rear elevation and all of the fascia is missing at the courtyard.

The roof structure has 2 x 4 (2" x 3-3/4" actual size) rafters at 24" O.C. These are augmented by horizontal or diagonal bracing members in some sections of the roof (photo 7). The 1 x 3 purlins are nailed to the rafters at 6" O.C., with wood shingles nailed to the purlins. The attic is reached by a stair leading from the lanai at the back of the building. The roof structure members all appear to be in good condition. There is currently no insulation in the attic.

Attached Kitchen Building

The kitchen building (photo 8) has a hipped roof with corrugated metal roofing. It appears from the original drawings that this was the original roofing type. The roofing is in fairly good condition, and has previously been patched. This structure also has enclosed eaves, which appear to be in good condition.

Attached Bedroom Wing

The bedroom structure (photo 9) has a gable-on-hip roof structure, with louvered vents at both gable ends. The roofing is the same asphalt shingle roofing as the main house, and is also in good condition. The fascias and closed eaves also appear to be in good condition.

Recommendations:

1. *Repair/replace the window in the central gable on the rear side of the house.*
2. *Replace approximately 20% of the shingles at the front central gable.*

3. *Paint the corrugated metal roofing at the kitchen building. Repair and reinstall the original ridge vent located on the ground (photo 10). Replace one corrugated roofing panel on the makai side.*
4. *Replace the fascia at the interior courtyard (photo 11).*
5. *Replace the fascia at the rear of the main house, adjacent to the bedroom wing.*
6. *Insulate all attic spaces.*
7. *Retain existing asphalt roofing shingles. When they need to be replaced, install new wood shingles.*

5.2.2 Roof Drainage

A metal gutter runs along the entire perimeter of the main house, including the courtyard, and at the attached kitchen building, but not at the bedroom wing. The round metal downspouts, generally located at the corners, lead directly to the ground below. The gutter and downspouts are both somewhat deteriorated, and several downspouts are missing.

Recommendations:

1. *Replace all gutters and downspouts with new copper downspouts and gutters to match the existing profiles.*
2. *Install splashblocks at the base of downspouts to direct water away from the house.*

5.2.3 Original Exterior Walls

The original exterior siding (photo 12) at the main house structure is rabbeted siding of 1 x 10 horizontal tongue & groove boards, of which 8-1/2" is exposed. The horizontal groove portion has a 1" flat surface and 1/2" diagonal surface exposed. The walls have a low wood wainscot, with vertical tongue & groove that has a center groove. The wainscot cap is a 1 x 6, beveled on the bottom, topped with a 2 x 4. Below the projecting 2 x 4 is a decorative molding strip. Building corners have a 1 x 6 casing. This exterior finish style is the same at the attached bedroom structure. The siding appears to be in good condition, although small areas of termite damage were noted in two locations.

The kitchen structure has vertical wood tongue & groove siding, with 1 x 6 casing at the corners, and a 1 x 6 baseboard. This siding is in good condition.

Recommendations:

1. *Repaint the entire exterior of the house.*
2. *Replace any damaged siding.*

5.2.4 Other Exterior Walls

On the southeast side of the house, the wall encloses the exterior lanai (photo 13). The wall finish and design exactly matches that at the rest of the house.

Recommendations:

1. *Move portions of the exterior wall as indicated in the drawings, retaining the existing location at one of the new meeting room areas, and at the new mens' room area.*

5.2.5 Wall Openings

Exterior Doors

Nearly all of the exterior doors at the main house and the attached bedroom wing have both an inward swinging wood door and outward swinging screen door. Some doors have glazing and others do not. The glazing at the doors from the lanais into the bedrooms is often obscure glass, usually in the "Florentine" pattern (photo 14). Doors leading to the front sitting room from the front lanai and the courtyard lanai (photo 15) are double doors; all others are single doors.

Exterior doors are generally 3'-0" x 7'-0". The doors at either end of the hallway between the dining room and pantry are both 4'-0" wide doors. A smaller 2'-0" wide door leads into a bedroom on the eastern side of the house where the wall was moved out. The screen doors are wood panel doors with three vertically oriented panels along the bottom, a horizontally oriented panel in the middle, and the screen above, which has a central vertical muntin. Only the screen doors to the front entry doors, leading into the sitting room are different; they have two panels at the bottom rather than three. Some doors have screened transoms above.

The paneled wood door has two panels at the bottom, a central horizontally oriented panel, and either a single glass pane or two vertically oriented panels above. These panels are fairly decorative, with a raised center portion with grooved lines, grooved trim along two sides, and a rounded bevel along the other two sides.

The exterior doors at the attached kitchen building and bedroom wing are the same as those at the original house structure, but are 2'-10" wide by 6'-10" high. Most doors appear to be in good condition, with some minor repairs necessary.

There are sliding doors (photo 16) at the west side of the rear lanai. It appears there were originally three doors, but only one door is extant. The wood door has a single wood panel at the bottom, and four glass panels above. The door and frame are in only fair condition.

Recommendations:

1. *Replace the screens at all screen doors and screened transoms.*
2. *Replace the mid-rails at both screen doors at the front entry to the sitting room.*

3. Patch door stile at linen room door to outer lanai.

4. Remove sliding doors and swinging door at rear lanai.

5. Replace door threshold at outer door to hallway passing through building, adjacent to pantry.

Windows

All windows at the main house are wood double-hung windows. At the main house, windows are one-over-one light. Most windows are 2'-10" wide and 7'-0" tall. The window has exterior casing on the top and sides; the sill and apron are continuous pieces that serve as the top of the exterior wall wainscot. The bottom of the top sash has decorative stile tails. One smaller window on the west side of the house has a decorative jamb casing extension at the apron, where the casing is cut diagonally into a point (photo 17). This is similar to windows at the attached kitchen and bedroom wings. Some window glazing is obscure glass, such as in the linen and china rooms, and typically in bathrooms.

At the main house, three sashes, one sill, and one pane are in need of replacement.

At the kitchen building, windows are divided light, two-over-two (photo 18). The bedroom wing has both one-over-one and two-over-two double-hung windows. The window sizes vary from 2'-6" wide to 4'-2" wide. Most windows at both buildings have a decorative jamb casing extension at the apron, where the casing is cut diagonally into a point. The addition at the kitchen has one-over-one and six-over-six double-hung wood windows.

At the bedroom wing, two sashes need to be replaced. At the kitchen building, one pane is broken.

Recommendations:

1. Replace window sashes and panes as required, at locations indicated in drawings.

2. Replace all window screens.

5.2.6 Lanais

The exterior lanais run continuously around the outside of the original house, and around the central courtyard. The lanai is 12 feet wide at the front of the house (photo 19), and 8 feet wide at the sides and inner courtyard. The outer and inner lanais are connected at the center of the back side of the house, where a large open lanai space passes through from the courtyard to the back lanai. This open lanai has a wood panel swinging door on the east side leading to the mauka lanai, and sliding doors with glazing leading to the west side mauka lanai. Large wood-framed windows were installed between the columns above the wood railing; one pane is broken. Wood tongue & groove covers the wood railing at the inside at this lanai area.

Recommendations:

1. Replace one window pane at windows at rear lanai.

2. Make operable the sliding glass windows above the rail at back center lanai.

Flooring

The flooring of the lanai is wood tongue & groove strip flooring, probably Douglas Fir. The flooring is generally in good shape, but is termite eaten or damaged in several places (photo 20). At eight columns, the flooring underneath is badly damaged, often causing the column and roof above to sink. The flooring also is damaged at the outer house lanai adjacent to the kitchen building, at the lanai near the stair behind the kitchen building, and at three places on the west side of the rear lanai.

Recommendations:

1. Refinish all wood floors at lanai. Patch where indicated in drawings.

2. Where indicated in drawings, remove wood column, repair wood flooring, and replace column.

Columns

The decorative wood columns at the edges of the lanai (photo 21) around the outside of the building, and at the inner courtyard, help to support the roof structure. These round columns are 8'-4" tall, with a 2" thick square wood bearing plate on top. The columns have a rounded base and top section, and rounded grooves cut into the lower part of the middle. The columns are approximately 7" in diameter. At least six columns need to be repaired at the base. One column at the east corner of the interior courtyard is substantially deteriorated at the top (photo 22).

Columns at the attached kitchen building are 5-3/4" square posts, and those at the attached bedroom wing are 5-5/8" square posts. Each post has a decorative wood capital piece at either side, below the eave plate. These square columns all appear to be in good condition.

Recommendations:

1. Repair top of column at northeast corner of central courtyard with new wood capital.

2. Patch columns at base as indicated in drawings (approx. 9 total) using epoxy patching compound.

Railings

The railings at the exterior lanais have two horizontal members, at the top and bottom of the railing. The lower member is 1-3/4" thick, and the top rail is 2-1/2" thick, with a rounded top. Balusters are straight vertical members.

Recommendations:

1. Replace missing railings at the east side of the house (2 sections) and at the east side of the bedroom wing (1 section).

Stairs

Three stairs currently lead to the front entry lanai, two on the southwest, front side, and one at the corner from the west side, in front of the kitchen wing. Stairs also lead to the outer lanai from the back of the west elevation, and from the rear elevation. There is one stair at the north side of the center courtyard. There was also originally a stair on the east side of the house front elevation, which is now missing. Stairs are also missing from the front of the bedroom wing, at the south side of the center courtyard, and at the eastern side of the back (northeast) house elevation.

The stairs at the front lanai have L-shaped (in plan) columns at the edge of the lanai. These columns have a thickened base and decorative molding at the base and near the top. The center front stairway has a hipped roof extending out over the stair, supported by the typical decorative round columns. These are sitting on top of square decorative posts at ground level, so that the base of the round columns are at the same level as those at the lanai. A staggered tongue & groove wall extends out from the house at each side of the stair, and is topped by sections of railing. The other two extant stairs at the front lanai have simple wood handrails, which are not the original railings; they originally looked similar to the front central stairway, without the extended roof.

The other extant stairways have wood stairs with simple wood handrails that are attached to the round columns at the edge of the lanai. These railings are not original.

Recommendations:

1. *Rebuild the stairway at the east side of the front elevation of the house. The railings and posts shall match the existing front (central) stair.*
2. *Rebuild the rails and posts at the two stairways at the west corner of the front lanai to match the existing front stair.*
3. *Rebuild the stairs at the central courtyard and at the front of the bedroom wing.*
4. *Construct an accessible lift at the house lanai, just in front of the kitchen building.*
5. *Repair the stair posts at the center stair.*

5.2.7 First Floor Structure, Foundation & Skirt

The existing first floor structure is constructed of 2x8 floor joists and 6x8 beams supported by 6x6 posts on concrete or stone footings (photo 23). The central footings are spaced at approximately 6'-0", and the perimeter footings at approximately 10'-0". The joists, beams, and posts appear to be in good condition. Dirt has covered the top of most of the footings.

The foundation at the front lanai has settled in various areas, particularly at the corner posts, and at the right front stair.

The skirt at the exterior wall, covering the foundation structure below the lanai, varies in appearance at the front and back of the house. The front and east elevations of the house, as well as the west side wall in front of the kitchen building, are sheathed in vertical wood tongue & groove, while the rest of the building has a diagonal lattice skirt. There is a large hole in the wood tongue & groove skirt at the center of the east side elevation of the main house (see photo 12). There are some areas of the lattice that need minor replacement, particularly on the rear elevation of the main house, at the back of the kitchen building (photo 24), and at the east front corner of the bedroom wing.

Recommendations:

1. *Remove six inches of the earth throughout the crawl space at the foundation to expose the top of the post footings which have become buried under silt.*
2. *Repair/replace 10% of wood lattice skirt that surrounds the building at the foundation.*
3. *Repair the hole in the wood tongue & groove foundation skirt on the east side of the house.*
4. *Adjust footings under posts that have settled.*

5.3 Interior

5.3.1 Planned Alterations to Interior

As part of the resort, the main house and attached kitchen and bedroom wings are planned to be used for greeting, administration, meeting, and museum space. The existing dining, sitting, library, pantry, china, and linen room, as well as one guest bedroom and the original kitchen building, would be used as museum space. In these rooms the furniture and other items currently found in the house will be displayed to help portray the history of the area, of the Robinson family, and of the building itself. The rooms in the kitchen building addition will be used as a catering kitchen.

The east side of the house and the attached bedroom wing would undergo the most interior renovations. At the two guest chambers with bathrooms at the front of the house, all interior walls and fixtures would be removed, and a bar constructed. Most of the interior walls in the east section of the house will be removed to create space for public men's and women's restrooms and three meeting rooms. Some of the exterior wall along the outer lanai will be moved to create more lanai space. The interior walls in the attached bedroom wing will all be removed to create the fourth meeting room, keeping only two storage rooms.

5.3.2 Interior Walls & Finishes

The interior walls have a variety of finishes. The walls in the sitting room and library are covered with wall paper on linen (photo 25). It extends to a wood molding at a height of 12'-0", with a plaster wall above the molding to the ceiling. The wallpaper is generally in fair shape, but

is peeling in a few areas. The adjacent dining room has a koa wood wainscot with wallpaper above, and a deep koa ceiling molding (photo 26). All three rooms have a deep wood base.

The bedrooms have a wallpaper, plaster, or canec wall finish. Bathrooms typically have wood wainscots with canec or wallpaper above, and closets have canec or wood tongue & groove wall finishes. The china room and pantry have wood tongue & groove walls.

The walls at the attached kitchen are wood tongue & groove, which appear to be in good condition.

The wall finishes appear to generally be in good condition, with a few exceptions. The wallpaper finish in the attached bedroom wing rooms is in poor shape.

Recommendations:

1. *Repaint entire interior of house at all existing painted surfaces (painted wood, gypsum board, plaster, canec).*
2. *Refinish koa wainscot at dining room.*
3. *Re-paper walls at dining room, sitting room, and library. Search for more information on original wallpaper design and restore if possible. If evidence of original wall paper cannot be found, replace with an appropriate period paper.*
4. *Remove wallpaper at bedroom wing. Remove interior walls as indicated. Install new wallpaper on gypsum board backing to match original finish.*

5.3.3 Ceilings

Ceilings are generally plaster, canec, wood tongue & groove, or wallpaper on wood. The ceiling in the dining room is the most decorative, with koa wood cased beams running in both directions, as well as diagonally at the center of the room (photo 27). This ceiling appears to be in good condition. Acoustic tile panels have been installed at the ceiling in the office rooms at the north corner of house.

The kitchen building ceilings are wood tongue & groove, which appear to be in good condition.

The ceiling finishes appear to generally be in good condition, with a few exceptions. The wallpaper ceiling finish in the attached bedroom wing rooms is in poor shape. Some other ceilings are simply in need of repainting.

Recommendations:

1. *Remove wallpaper at ceilings in bedroom wing building, install gypsum board ceilings.*
2. *Remove acoustic tile ceiling in office rooms and install new gypsum board ceiling over existing wood.*
3. *Repaint all ceilings.*
4. *Refinish koa finish of beam falsework in dining room.*

5.3.4 Floors

All floors are tongue & groove wood flooring. The wood floors appear to be in good condition, but need to be refinished or repainted. Some floors have an additional flooring surface installed on top of the wood floor. The two office rooms, as well as one of the bedrooms, have a cork tile flooring. The cork flooring is in fair condition.

Three bathrooms have vinyl tile flooring. Several bedrooms have a woven mat covering over the wood flooring. The woven mats are substantially worn, and are even worn through in some areas.

Both the kitchen building and bedroom wing rooms also have tongue & groove wood flooring, which also appears to be in good condition.

Recommendations:

1. *Refinish or repaint all wood floors, except in plan where carpet or other finish is called for.*
2. *Remove all woven mat flooring.*

3. Remove existing deteriorated cork flooring. Consider installing new cork flooring in offices.

5.3.5 Interior Doors

Interior swinging doors either have the same pattern as the exterior doors (with no glazing), or are single-panel wood doors. Most doorways have a decorative wood casing, with a raised square with a circular indentation at the head corners. The interior doors appear to be in good condition. Sliding doors are located between the library and sitting room, and the sitting room and the dining room. The condition of these doors needs to be evaluated.

At the kitchen building, interior doors are screen doors with four rectangular screen openings. Most of the interior doors in the bedroom building are to be removed in the proposed renovations; the remaining doors should be evaluated.

Recommendations:

1. Salvage and store any doors removed during demolition that are not to be reused at this time.

5.3.6 Furniture & Other Contents of House

The entire house contains a substantial amount of historic furniture and other items, which include books, guns, desk items, personal correspondence, artwork, linens, china, lamps, luggage, and sports equipment.

Substantial furniture pieces of koa or other decorative woods include the dining room table and numerous chairs with a leather seat pad, china hutch, couches, shelves, book cases, and a gilded mirror in the sitting room, and bookcases in the library (photo 28). Several bedrooms contain beds with wood head and foot boards, and matching dressers, chairs, and night tables. The interior furniture all appears to be in good condition.

The pantry contains sets of crystal and china of European and Asian origins (photo 29). Book cases contain many books, and desks contain correspondence, stamps, photographs and negatives, and writing instruments from the 1800s and early 1900s.

The kitchen contains a large cast iron stove (photo 30), probably original to the building. At the central lanai space at the rear of the house is an old, large pool table with heavy wooden base, a deteriorated piano, and several other furniture items. The front lanai contains wood benches and rockers, all in need of refinishing.

Recommendations:

1. Remove rust and refinish cast iron stove.
2. Clean and refinish lanai wood furniture as appropriate.

3. Inventory all interior furnishings and other contents of house. Work with the Robinson family to decide which of the furnishings should be saved for display in the museum, which should be removed and kept by the family, and what, if any objects might be curated off site.

5.3.7 Bathroom Fixtures

The smaller bathrooms generally have corner sinks. Bathrooms that have not been renovated have free-standing bathtubs. The bathroom fixtures appear to be in good condition.

Recommendations:

1. Replace the fixtures in the bathroom at the current guest chamber on the northwest side of the main house with new fixtures that are of the same style as the original fixtures, or are of a simple modern style.

5.4 Door Finish Hardware

The door hardware at the main house is quite decorative. The escutcheon and the hinge plates have a Victorian pattern. The escutcheon and hinges are brass. The doorknobs are black ceramic.

The screen doors have a small steel knob and hinges, which are quite rusted.

Hardware at the kitchen building and at the bedroom wing needs to be evaluated.

Recommendations:

1. Clean and oil all brass door hardware.
2. Replace all screen door hardware with brass hardware to match design of existing.
3. Completely inventory all hardware to decide what to save.

5.5 Light Fixtures

Exterior

Modern flood lights have been installed at the exterior eaves at the front of the house and at the west front stair. These are centrally located above the stairs, and have replaced earlier glass ball light fixtures, which are extant at the east side, back of the west side, and back (north side) of the house above the stairs.

A few historic, possibly original, wall mounted lights are located around the building: one on the pilaster on the east side of the front entry, one at the west side of the interior lanai, and two at the rear lanai. These have a decorative round base that support a scroll and a fluted glass shade (photo 31).

A modern fluorescent light has been installed at the rear lanai, over the pool table area.

Interior

The structures contain many early, possibly original, light fixtures. The dining room and sitting room have ornate chandeliers suspended from the middle of the ceiling (see photo 25). These appear to be kerosene/electric fixtures. Some rooms have ceiling mounted fixtures, while others have fixtures suspended from a long cord from the ceiling. Most rooms have floor or desk lamps that appear to be from the early 1900s.

The kitchen wing has ceiling mounted or pendant fixtures that appear to be from the mid-1900s.

The attached bedroom wing fixtures need to be evaluated.

Recommendations:

1. *Rewire the entire house.*
2. *Clean all existing light fixtures.*
3. *Remove the fluorescent fixture at the rear lanai.*
4. *Augment existing lanai lighting to attain an adequate light level. Use fixtures that are appropriate to the building.*
5. *Modern light fixtures will be installed as needed for the newly renovated spaces. The style of these fixtures shall not be historic, but they should not be starkly modern either.*

5.6 Stored Architectural & Other Elements

Underneath the house are stored some architectural elements (photo 32) that were removed from the house, either due to renovations or due to the damaged state of the element. Elements noted are stair rail columns and sections of railing.

The attic contains some light fixtures and furniture, as well as other artifacts such as steamer trunks, painted ipu or 'umeke gourd, calabashes, and baskets (photo 33).

Recommendations:

1. *All architectural items underneath the house shall be inventoried. Those that can be reused, such as the stair railing posts and railings, shall be repaired as necessary. Those that are not to be reused at this time shall be placed under the house, elevated off the ground.*
2. *Items in the attic shall be inventoried. Those that are chosen to be re-used in the house or used for display shall be repaired as necessary. Others shall be kept in the attic, and covered with a dust cloth. It is recommended that most of the luggage be discarded.*

PART 6 - DESCRIPTION OF OTHER STRUCTURES AT SITE AND RECOMMENDATIONS

6.1 Caretaker's/Guest Cottage (Site 50-30-9-764, Feature B)

6.1.1 Historical Information

This small cottage (Figure 34) is located adjacent to the main house, along the Waimea side of the makai lawn. The exact date of construction is not known, but it is likely that the cottage was constructed as guest quarters not long after the main house was completed, almost certainly before 1920. Some of the architectural details or elements are the same or very similar to those at the main house. The style of the original doors, window casing, and other architectural details suggest that the house was built around the turn of the century. Historic photographs of the building (Figure 35) and site show this building in place before the boys' rooms wing was added to the main house, and the age of the people and clothing present in some photographs also verify the date.

6.1.2 Description

The original portion of the building is rectangular in plan, 34' x 57', with a lanai running the full length of the building on the Hanapepe and mauka sides. The building has a wood post and beam foundation, and wood frame and roof structure. The hipped roof was originally double-pitched; new rafters have been added over the original rafters to change the roof to a single pitch. The roofing is fairly new asphalt shingles, matching that at the adjacent house and office building. The original roofing was wood shingles. The edge of the lanai has tapered wood columns with a thickened base and decorative capital pieces. Portions of the lanai and foundation are currently being rebuilt. The column capitals are missing at the posts along the Hanapepe side. The stair located at the middle of the Hanapepe side, and the railing between the columns on this side, have been removed. The exterior baseboard is missing at the Hanapepe wall.

The exterior siding is vertical 1x6 tongue and groove boards. Windows on the Hanapepe side are double-hung 2/2 lite wood windows, with decorative apron and head at the exterior casing. The three entry doors on the Hanapepe side are four-panel wood doors or two-panel with glazing, and have wood panel screen doors. The doors also have the decorative head at the exterior casing. Other windows are smaller 1/1 lite double-hung windows without the decorative casing.

An attached carport has been constructed on the makai side, and a storage area was built on the Waimea side, and is attached at the roof. A small entry addition was built on the Waimea side.

The building appears to generally be in good condition, although it has suffered some weather damage, particularly on the Hanapepe side. The exterior is in need of repainting, the foundation skirt boards need to be replaced on the Hanapepe side and mauka/Hanapepe corner, and much of the horizontal skirt board along the top of the foundation is damaged. Some of the eave and fascia boards need to be replaced.

6.2 Office (Site 50-30-9-764, Feature C)

6.2.1 Historical Information

The office structure is composed of two of structures (Figures 36 and 37), unified by a walkway and a wood deck. The makai portion is now used as office space, and longer mauka portion houses tack and storage rooms and additional office space. These were connected with a new lanai deck and roof structure in 1991. It is unknown what the original purpose of these structures was, although the makai office building likely served as either office space for the property or as additional guest or worker accommodations.

The makai office structure appears in early photographs of the site, including one taken in the 1920s. The building has several architectural similarities to the kitchen portion of the main house, including the louvered ridge vent, the column capital detail, and the 2/2 lite double-hung wood windows. It is likely that this building was constructed at the same time, or not long after, the kitchen wing was built with the main house (c. 1897).

The mauka building does not appear in the 1920 era photograph, and was likely constructed sometime in the 1920s to mid-1930s. Its construction materials and style indicate that it was not built much later than the mid-1930s.

6.2.2 Description

Although the two structures are connected by the lanai and roof, there remains an open passageway between the two, which has a wood floor connected to the lanai built during the 1991 renovation. The makai office building is rectangular in plan (if the lanais are considered), with dimensions of 32' x 40'. The exterior of the structure was changed little in the recent renovation. The building has a wood post and beam foundation, and wood frame and roof structure. The hipped roof has a monitor ridge vent with louvered vent openings. The foundation skirt is diagonal wood lattice. The exterior walls are vertical tongue and groove wood boards. The windows are generally 2/2 lite double-hung wood windows with simple casing. The 1991 renovation made some interior renovations, including the construction of two walls, the removal of a few walls, and the relocation of entries, but the effect on the exterior appearance is minimal.

The mauka structure essentially has two parts: the tack and storage rooms at ground level, and the office portion with a higher floor level on the makai side. The overall building dimensions are 27' x 57'. The foundation is wood post and beam on the Hanapepe and makai sides, and concrete slab on the Waimea side. The walls are wood, and the roof has a wood structure with asphalt shingle roofing. The roof corners are beveled, except where the roof meets the roof of the adjacent office structure. The lanai is also beveled on the Hanapepe side corners. The exterior walls are vertical tongue and groove wood boards. Windows at the office portion are 1/1 lite double-hung wood windows, while the window on the mauka end of the building, at the storage area, is 6/6 lite. Doors to the storage room are made of vertical tongue and groove boards, and those at the office section are wood panel doors. The building appears to be in fair to good condition, and needs only cleaning and repainting at the storage room portion.

6.3 Garage (Site 50-30-9-764, Feature D)

6.3.1 Historical Information

This structure appears in an early photograph of the site, with a group of horseback riders in front of the building (Figure 38). In this photo, the current garage doors do not exist, and this front wall has at least one pedestrian-size door and a 6/6 lite double-hung window. A wood ramp leads up into the center part of the building, but not across the entire front, as it is now. An awning roof extends out just below the bottom of the windows at the upper wall, and is supported by wood posts with a wood railing. A definite line can be seen on the building row where this awning roof was located. From the photograph, it appears the building was associated with equestrian activities and storage.

6.3.2 Description

The overall building dimensions are 32' x 54'-4". The structure is quite tall, with a gable roof with a very small overhang, and corrugated metal roofing in very poor condition. Sections of the corrugated roofing have been missing for at least 7 years, causing further damage to the building. The exterior walls are vertical tongue and groove boards. The lower half of the front (makai) wall has four pairs of large swinging doors, also made of vertical tongue and groove boards (Figure 39). There are two double-hung 6/6 lite wood windows near the top of this wall. The Hanapepe side has a window which appears to be a double-sash horizontal sliding window, and has a door into the upper level with a fallen-down wood stair on the exterior. Very little of the Waimea and mauka elevations are visible due to vines and plant growth, but the mauka side has at least one window and a vehicle opening that leads out to a wood ramp, open at the middle, for vehicle maintenance. The interior has a small room on the mauka side, and a dirt floor. Items inside the building include several old cars, two horse-drawn carriages, and modern ground keeping equipment. The entire building currently is leaning severely, and is about to collapse. The items inside this structure should be removed and stored elsewhere due to the danger of the building's failure.

Adjacent to the garage, on the Hanapepe side, is the foundation of a former tack/saddle shed building (Site 50-30-9-764, Feature E). This building was reportedly destroyed in Hurricane Iniki. Some of the collapsed walls are still laying on top of the foundation, and many of the items once stored inside still remain where they were when the building was still standing. These items should be sorted to determine if any are salvageable. The door hardware should also be salvaged.

6.4 Greenhouse/Fernhouse (Site 50-30-9-764, Feature F)

6.4.1 Historical Information

The construction date of the greenhouse is unknown, but it appears from the materials and construction style to have been built by about the 1920s. A Robinson family member remembers it being used as a fern house.

6.4.2 Description

The structure (Figure 40) is 22'-4" x 31'-6" in plan. The gable roof has wood roof trusses. It currently has no roofing and is covered with vines. It is unknown if the building previously had some kind of roofing or shade material on top. The walls are vertical wood boards of various width on a wood frame structure. The perimeter wall sits on a curb wall that is made of mortared stone at the bottom with two rows of concrete block on top. The floor level is lower than that of the surrounding ground level; reportedly the floor level used to be even lower, but additional dirt accumulated when the area was flooded during the 1980s. A single door opening with no door is at the middle of the mauka elevation.

6.5 Water Tower

6.5.1 Historical Information

The remains of a water tower (Figure 41) is located about mauka of the main house. It is not known when this tower was constructed, but it appears it was similar to another tower that was located just mauka of what is now the office building. The lower located near the office building was probably built before or at the same time as the completion of the main house c. 1897; a historic photograph seen of the main house about the time of completion was probably taken from the tower. It also appears in photographs of the area taken sometime between 1900 and the mid-1920s. It is likely that the tank whose remains we see mauka of the house also dates from this time period.

6.5.2 Description

The structure originally consisted of a large cylindrical wood water tank supported on a foundation of large wood beams and large round posts on concrete piers. The water storage tank portion of the structure is completely gone, except for the base and some of the metal bands that went around the tank. A wood stair partially remains on one side, leading up to the platform level of the tank bottom. A large metal pipe that once led from the bottom of the tank to the ground level still remains.

6.6 Wash House

6.6.1 Historical Information

The construction date and the original appearance of the wash house structure(s) is unknown.

6.6.2 Description

Mauka of the main house near the water tower ruin is a concrete slab, approximately 20 feet on each side, with a curb around the outer edge, and a metal pole at each corner and at the center of the slab (Figure 42). Each pole, about six feet high, has a metal hook near the top, and the center pole has a curved metal loop protruding from the top. Attached to each of these are the remains of metal wires; it appears these wires were strung between the poles to create a large clothesline system. Adjacent to this slab is a small concrete stove (Figure 43), rectangular with an opening

at the top and at the front for inserting firewood. A pile of firewood still lays next to this stove. The stove probably was used to heat water for the laundry. A pile of wood and corrugated metal lays in a heap here also, and likely was once a roof structure over the stove area. The slab and stove are in fair to poor condition.

Just mauka of the laundry clothesline and stove area is another concrete slab (Figure 44) with a concrete curb on three sides and down the middle of the slab. Metal bolts at the corners and along the curb indicated there was once a wood wall and roof structure above. This structure may have been part of the laundry service area.

6.7 Other Structures

6.7.1 Description

Just mauka of the main house in the former garden area is a small shed (Figure 45). Approximately six feet by 10 feet, the shed has a wood foundation, vertical tongue and groove wood siding, and a gable roof with corrugated metal roofing. The roof projects out to provide an awning over the entry. A single window on the mauka side has a six-lite wood sash, and the entry door is a four-panel wood door with a black ceramic knob. The siding boards are heavily deteriorated at the bottom, and the metal roofing is in poor shape. The building appears otherwise to be in fair condition. Inside this structure is a stack of wood window sashes.

On the opposite side of the mauka lawn is another small shed. This building has corrugated metal siding and roofing, and is currently covered with vines. The condition of the structural elements could not be determined in detail, as the vines prevent access to the structure, but it appears to be in poor condition.

On the Waimea side of the parking area by the office and garage is another shed structure, which is in poor condition. Piles of wood around this structure include some architectural elements from the adjacent buildings, such as wood columns and railings from the main house. The debris should be sorted through and any salvageable elements retained.

6.8 Employee Housing (Site 50-30-9-764, Features G-N)

The eight camp/employee houses are designated as sites 50-30-9-764, features G through N, and are lettered sequentially with G the northernmost house in the group, and N the southernmost house.

6.8.1 Historical Information

Eight small houses are located approximately 500 feet west of the main house. These structures were built as housing for employees of the Robinson estate, most likely for servants tending to the main house and surrounding property. Earlier houses were located in the same or approximately the same area as the existing houses; a 1912 USGS map and a 1930s aerial photograph show buildings in about the same location as the existing. Gay and Robinson Company tax records indicate that two of the houses were rebuilt in 1953 and two rebuilt in 1954.

The designs and materials of the eight houses are so similar that it is nearly certain that they were all constructed close together in time. Although one area resident recalls that some houses were rebuilt possibly as early as the 1940s, it is likely that the existing employee houses were all rebuilt around the 1950s. The houses continued to be used by employees of the property at that time. The same area resident recalls that the chauffeur, the cook, and gardeners all lived in these houses around the time of reconstruction. The main house at the property was occupied up until 1986, and at least one or several of the camp houses were still used by someone working for the family at the property until that time. Other residents of these houses were typically employed by the Gay & Robinson Company.

6.8.2 Description

The camp houses are located just west of the main house, but are separated both visually and physically from the main house area by a ditch and dense landscaping. There is a small pedestrian bridge across the ditch, but there is no direct vehicle access between the camp houses and the main house. The camp houses are reached by a separate road than the driveway leading to the main house; this road leads directly from Kaunualii Highway, and then forks into roads leading both behind and in front of the houses.

The eight houses are nearly identical, varying slightly in layout or size. There appears to be two different floor plans, with either three or four bedrooms, and varying in size between approximately 1064 square feet and 1311 square feet. The construction style and type of materials is the same for all houses. Only a few houses have received any exterior renovations. Most of the eight structures have a storage shed or garage on the rear side, typically attached only at the roof to the main house. Nearly all of the storage and garage units appear to have been built about the same time as the houses.

The houses are rectangular in plan, with wood post and beam foundations, and vertical wood T&G exterior siding. The gable roofs have wood truss structures and corrugated metal roofing. The metal roofing has been replaced with or covered by asphalt rolled roofing at two of the houses. The gable end walls have wide horizontal board siding and louvered vents at the upper portion of wall. The windows are double-hung wood windows with six-over-six lights. The windows are typically paired, except at the bathrooms. There is typically one front entry leading into the living room, and an entry on the back side leading into the kitchen. The front entry has a gabled roof projecting from the main roof, and a small porch with wood railing and wood steps. The rear entry has a wood deck with a wood railing and wood steps, but no roof overthead. Foundation skirts are horizontal 1x3 boards.

The interior side of the exterior (perimeter) walls have a v-joint and a 1x4 girt, rounded on the exposed edges. The interior walls are also constructed of vertical 1x6 T&G with v-joints. The interior walls have a 1x4 simple wood base. The cane ceilings are 8'-0" high, with a quarter-round at the top of the walls. The doors are typically wood single-panel doors, except at closets, which have five-panel wood doors. Door hardware is simple brass or metal knobs, and flip-latch locks at the closets.

The houses have received little renovation, and generally retain their original layouts, materials, and character. The original windows, doors, and cabinetry generally remain. At least one house retains a metal-lined shower.

The houses appear to generally be in good condition, with little termite or other damage. Some houses are in need of new roofing and paint, and the two vacant houses need to have overgrown vegetation cleared away. Two houses have been recently renovated. The renovations did not alter the significance of the structures, as changes were confined to new bathroom and kitchen fixtures, rewiring of the electrical systems, and general cleaning and painting.

PART 7 - STATEMENT OF SIGNIFICANCE AND GENERAL RECOMMENDED TREATMENT

Main House

The main house and attached kitchen building are over 100 years old, well past the 50 year minimum for consideration of significance by the NRHP. The original sections of the building are basically unaltered; later additions have left the original sections intact. The house is an example of the Queen Anne style, which is a sub-type of the Victorian style, typical of the turn-of-the-century period. The Queen Anne style utilized details such as hipped roofs with gables (typically having a dominant front-facing gable), turned porch columns, bead decorative elements, patterned shingles and scroll-like elements at the gables, pent roofs enclosing the gable, brackets to accentuate overhangs, and full-width porches, all used at this house. The house design is unique in its modification for the local climate and lifestyle by including a central courtyard and continuous deep lanais around the courtyard and the building exterior. The lanai area is so extensive that it makes up more than half of the total floor area of the house. Also, most rooms open to both the courtyard and exterior lanai. The house was designed by C.P. Ripley and Arthur Reynolds, prominent architects during that period in Hawaii. The house is therefore significant under Criteria C, as it embodies the distinctive characteristics of a type and period, and possesses high artistic values. The house is also significant under Criteria B, as it is associated with the Robinson family, who are important in the history of the islands of Kauai and Niihau, and the state of Hawaii. The house is the primary structure at the site, and is the most significant architectural feature there. The bedroom wing, although a later addition, has been part of the house complex for more than 50 years, and has developed significance as part of the complex. It was built using the same materials and style as the original main house, and blends in architecturally.

The main house and attached kitchen and bedroom wings shall be preserved as much as possible, particularly on the exterior. Damaged architectural materials shall be restored using material types and sizes to match the original. Historical items inside the house, as well as historical photographs of the house and area, shall be displayed in order to give guests and understanding of and appreciation for the history of the house, of the Robinson family and their activities, and of the development of the area.

Caretakers/Guest Cottage

This structure has been an integral part of the property since the earliest historic-period construction on the site, and served an important role as guest quarters for visitors to this then-remote location. Although there are a few additions to the structure, most of these are attached

only at the roof, and do not affect the historic fabric of the structure. These additions could easily be removed. The building has been used for the same general purpose since its construction. The building is a relatively unaltered historic structure, with construction materials and style representative of its period, that has played an important role in the history of, and activity at, this property. It is a significant part of the historic Kapalawai complex. This building is significant under criteria B and C, as part of the complex which is associated with the Robinson family, which embodies the distinctive characteristics of a period of construction, and as part of a significant and distinguishable entity (the house and complex at the site).

The cottage will most likely be used for administrative space. The exterior of the building will be restored, including repair or replacement of all damaged material, and removal of the non-historical additions. This work will increase the historical integrity of this structure.

Office Building/Tack/Storage

These buildings are significant as relatively intact historic structures that played an integral role in life at the Kapalawai complex. They have been part of the property since the earliest historic-period construction on the site, and have been in continuous use as part of the property since construction. These buildings are significant under criteria B and C, as part of the complex which is associated with the Robinson family, which embodies the distinctive characteristics of a period of construction, and as part of a significant and distinguishable entity (the house and complex at the site).

The office building will continue to be used for that purpose. The tack and storage portion on the mauka side will be cleaned and repaired. It is possible that an adjacent structure or addition to the office building will be constructed to serve as a reception area for arriving guests; if this occurs, it will be designed to conform to the Secretary of the Interior's Standards for additions to historic buildings and for new construction adjacent to historic buildings.

Garage and Adjacent Tack Room

The garage has significance due to its age and essential role it served at the site. The front elevation has been somewhat altered from its original appearance by the replacement of the lower portion of the wall with the doors, and the removal of the awning roof. The changes in the structure reflect the changes in the type of activities and mode of transportation available throughout the history of the site. The building appears to be structurally unsound and in very poor condition. Additional investigation of the stability and condition of the building will be done to determine if it can be saved. If it is demolished, the plant growth should be cleared off of the garage structure as much as possible, and the building should be photographically documented, using equipment and materials that meet the Secretary of the Interior's Standards for documentation. The tack shed building is a ruin, and will be removed.

Employee Houses

At least four, and possibly all of the houses, are not yet 50 years old, which is the minimum age for properties to generally be considered as significant under National Register Criteria. However, these structures have been part of the property for at least 45 years, and have served an important role as housing for employees of the Robinson family. The buildings have been used for the same general purpose since their original construction, and for the same purpose as the houses that they replaced at the same location. The buildings are relatively unaltered structures,

with construction materials and style representative of their construction period. The houses are significant as a group of related structures that have played an important role in the history of, and activity at, the historic Kapalawai complex.

The houses will continue to be used as housing for employees of the development or the Gay and Robinson Company, continuing the historical use of the structures. Alterations will be limited to general repairs and maintenance whenever possible, with replacement construction occurring only when necessary, when buildings cannot be rehabilitated. The current residents will be allowed to remain in these houses. At the time of this report, four of the eight houses are occupied.

Greenhouse

The greenhouse has certainly been present at the site for many years, and has significance as a structure continuously used for the same general purpose since its construction. However, due to its poor condition, like the garage buildings, repairs needed would require so much reconstruction, that very little historic material would remain, diminishing much of the building's historical integrity.

Current plans do not include the restoration or the development of the garden area. This building will be demolished due to its poor condition. Prior to demolition, the plant growth should be cleared off of the greenhouse structure as much as possible, and the building should be photographically documented, using equipment and materials that meet the Secretary of the Interior's Standards for documentation.

Water Tank

The water tank has been present at the site for a long time, and certainly served a very important function during its days of use. However, the structure is now in such poor condition, and has lost so much of the original material, that it retains little historical integrity.

This structure is located in an area that is not included in the development area. This structure will remain as a ruin, unless it is decided to develop this area as part of the resort.

Wash House Structures

Although once used to complete an important function at the property, these structures do not have enough historic material remaining to be significant. No historic photographs or records of the original appearance of these structures is known.

Other Structures

The three sheds surveyed at the site have little significance due to their minor roles at the site. The shed by the driveway and the metal-sided shed by the mauka lawn are ruins. The wood-sided shed, however, is in better condition, and has more substantial construction materials. It is also probably older than the other sheds.

Both the storage shed adjacent to the parking area by the office building, and the corrugated metal shed on the Hanapepe side of the mauka lawn shall be demolished. The wood-sided shed in the garden area will remain, and can continue to be used as storage for the grounds

maintenance. The window sashes currently stored inside it should be removed, and stored with other architectural elements from the property for possible reuse.

PART 8 - PHOTOGRAPHS

Photo 1 (top) - Pond east of house

Photo 2 (bottom) - Beach south of house



Photo 3 (top) - Dwarf Rhapsis (Bamboo Palm) hedge at house
Photo 4 (bottom) - Gateposts and Wrought iron gate south of house



Photo 5 (top) - Front of house with gables at hippec roof
Photo 6 (bottom) - Interior courtyard



Photo 7 (top) - Roof structure
Photo 8 (bottom) - Attached kitchen building

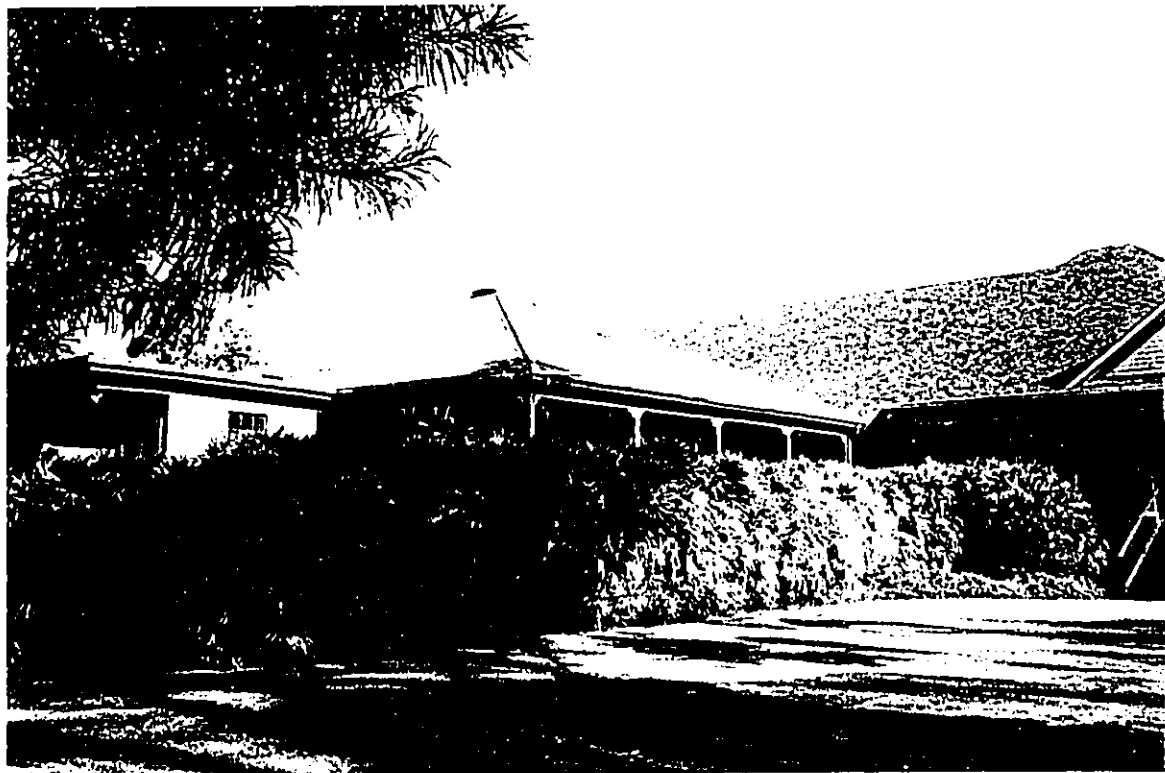
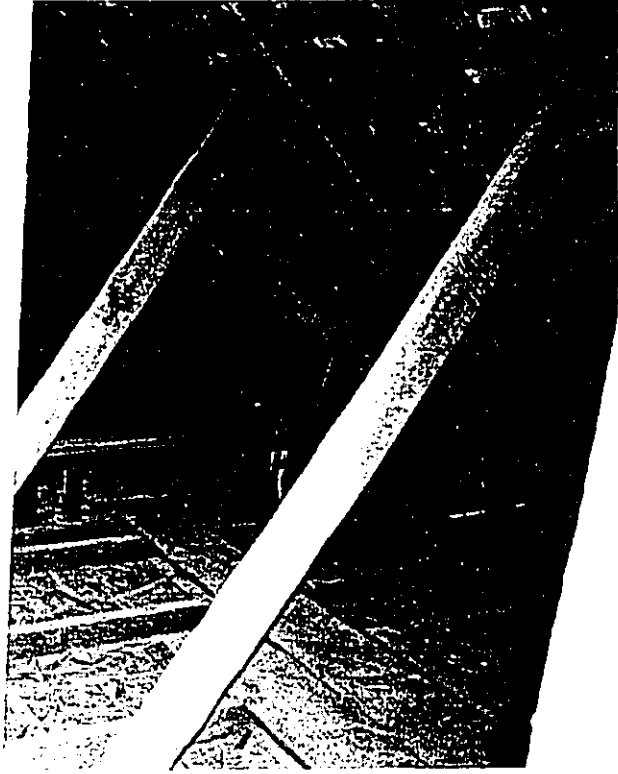
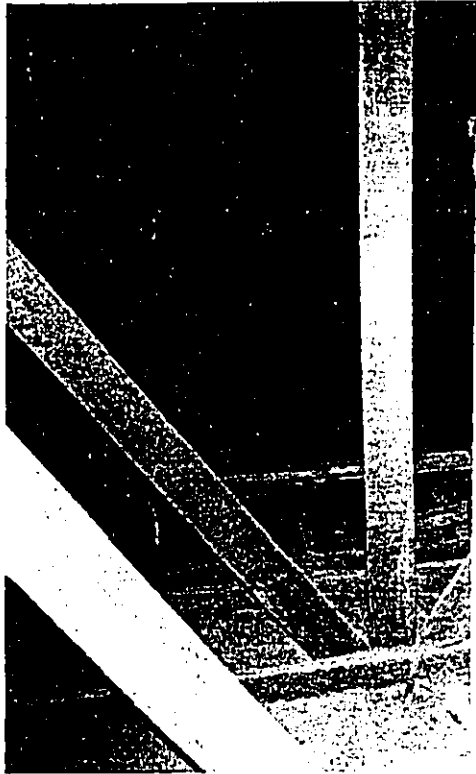


Photo 9 (top) - Attached bedroom wing
Photo 10 (bottom) - Original kitchen building ridge vent

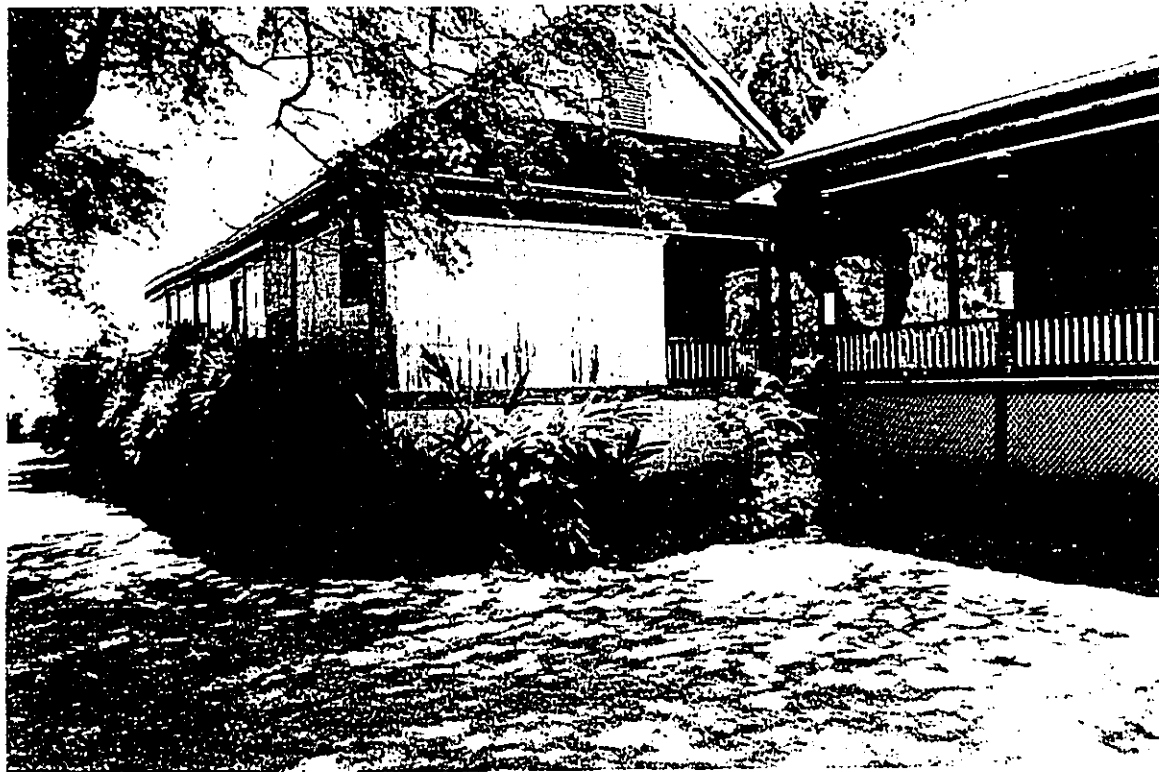


Photo 11 (top) - Fascia at interior courtyard

Photo 12 (bottom) - Exterior siding

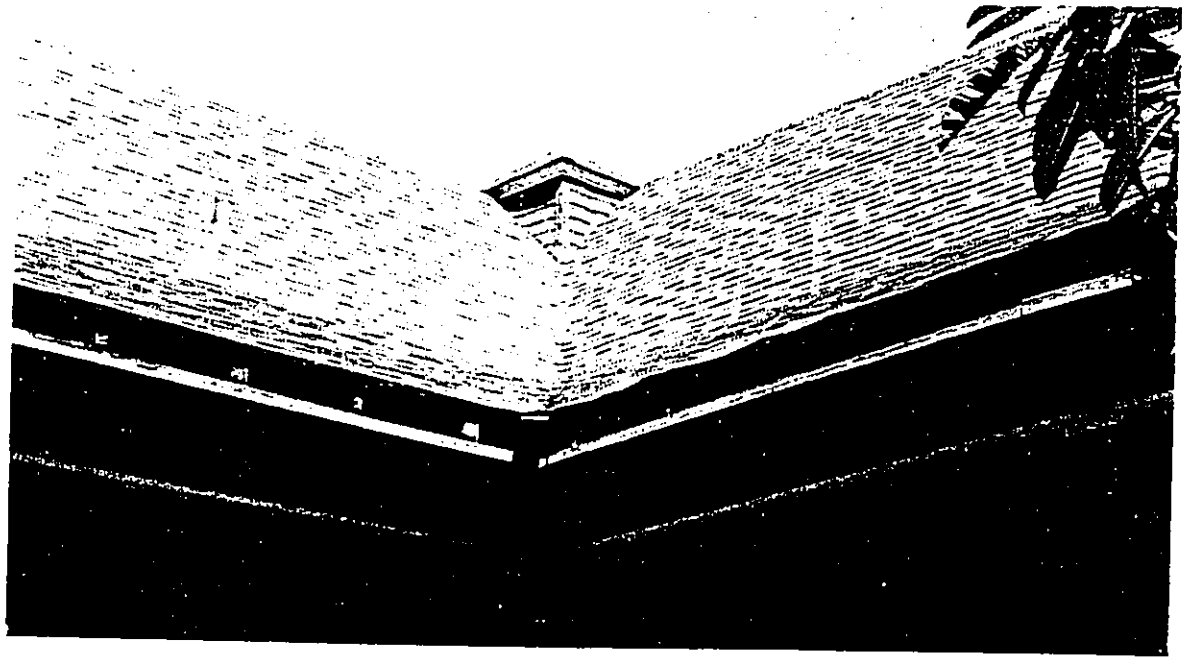


Photo 13 (top) - East side of building showing exterior wall
Photo 14 (bottom) - Exterior door with obscure glazing

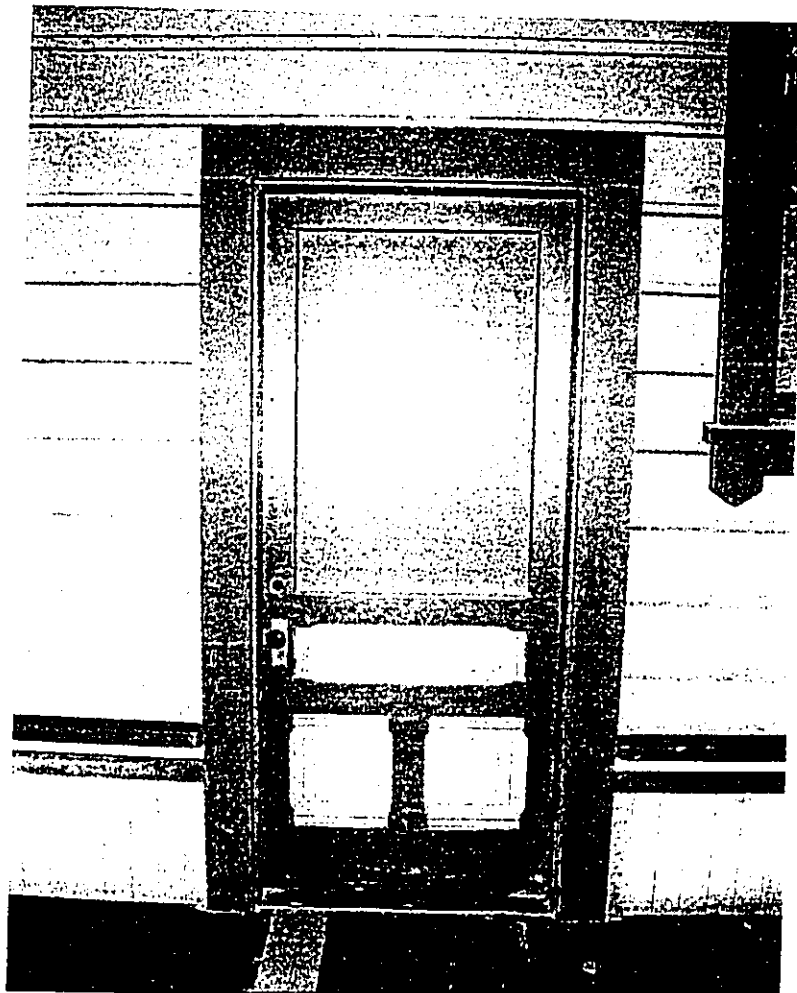


Photo 15 (top) - Double front entry screen doors
Photo 16 (bottom) - Sliding door at rear lanai



Photo 17 (top) - Window at west side of house with decorative casing
Photo 18 (bottom) - Kitchen building double-hung windows

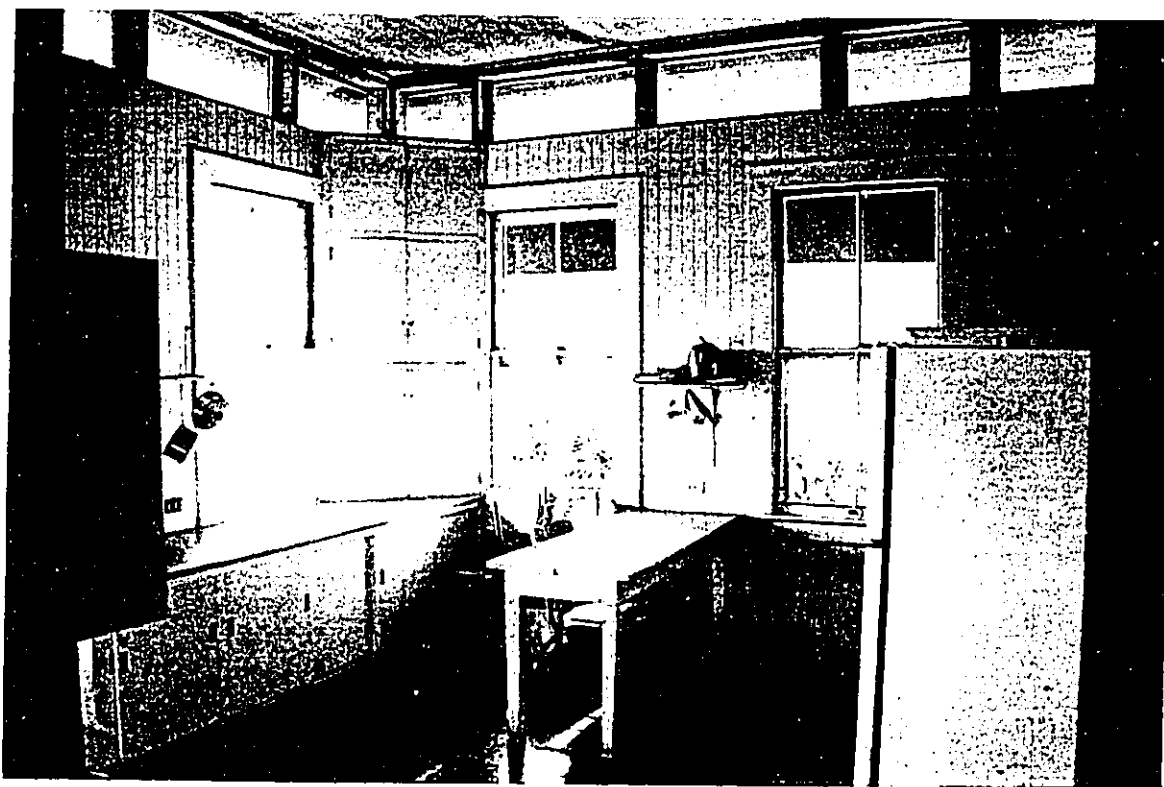
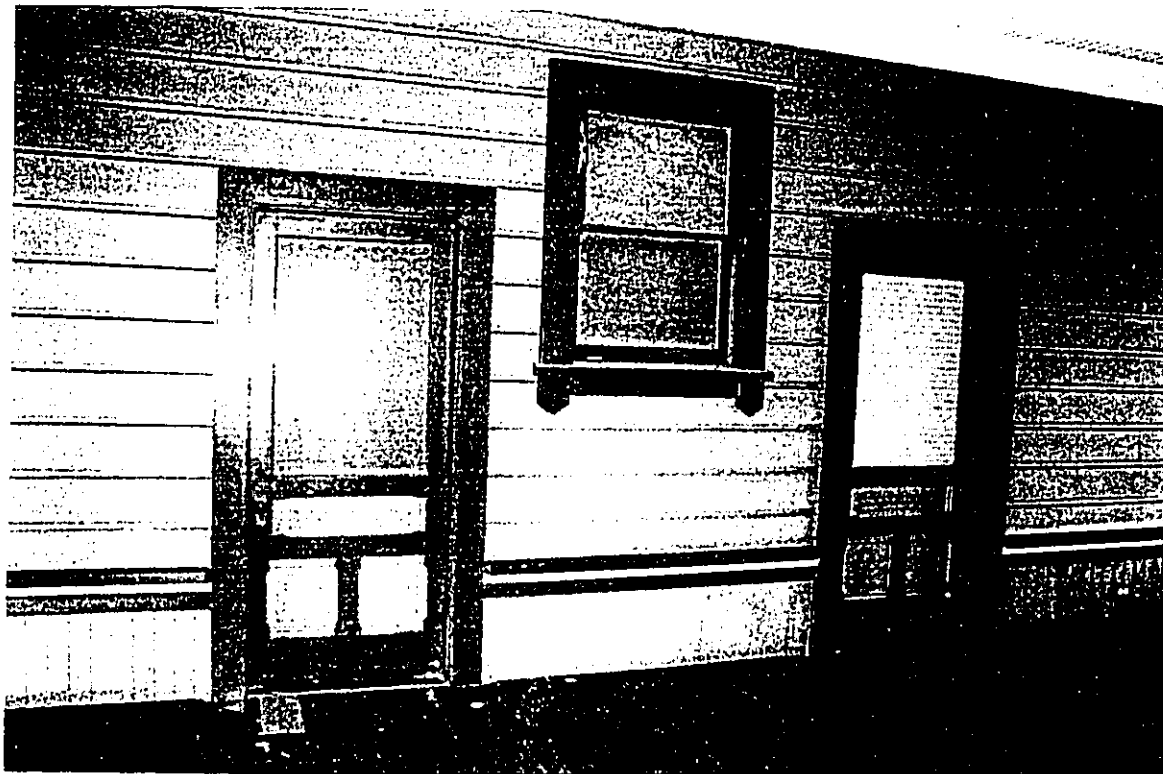


Photo 19 (top) - Front lanai
Photo 20 (bottom) - Damaged flooring at lanai

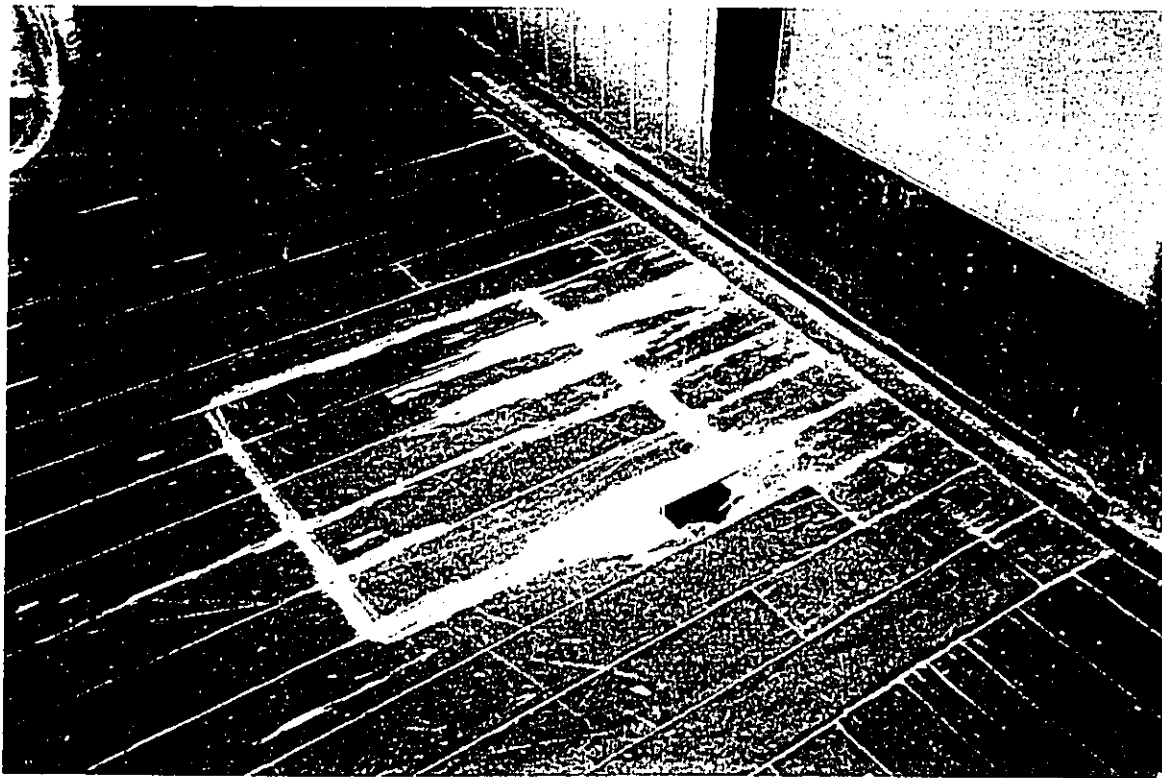


Photo 21 (top) - Decorative wood column at courtyard
Photo 22 (bottom) - Deteriorated column top at courtyard

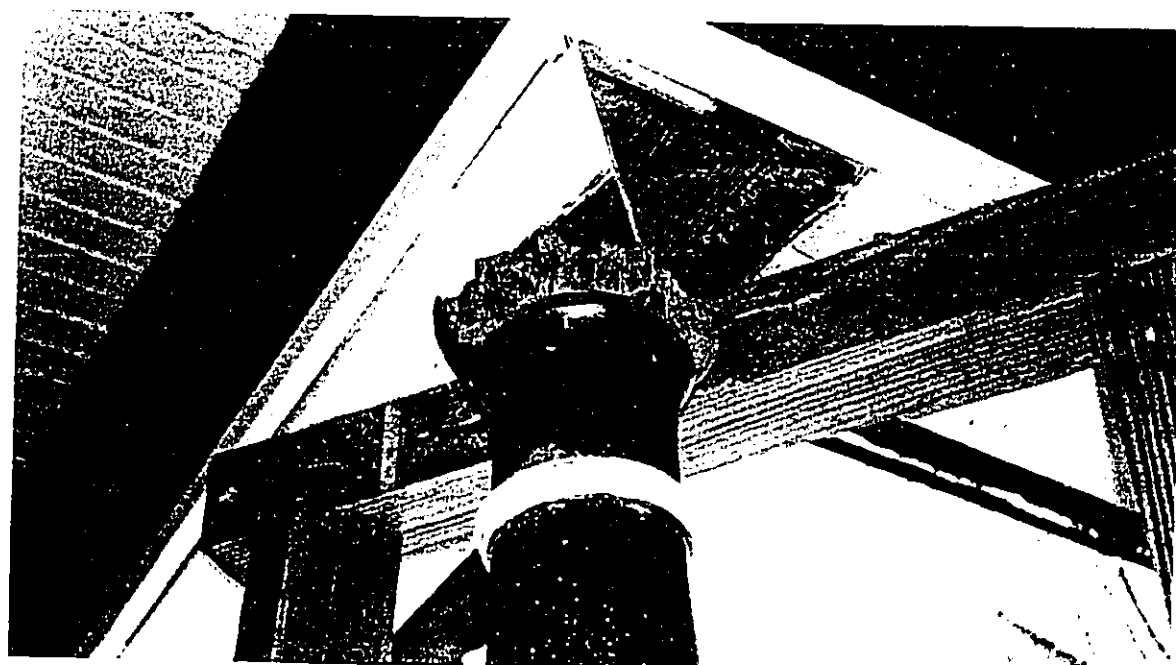


Photo 23 (top) - Foundation
Photo 24 (bottom) - Damaged lattice at kitchen building



Photo 25 (top) - Wallpaper at sitting room
Photo 26 (bottom) - Koa wainscot at dining room

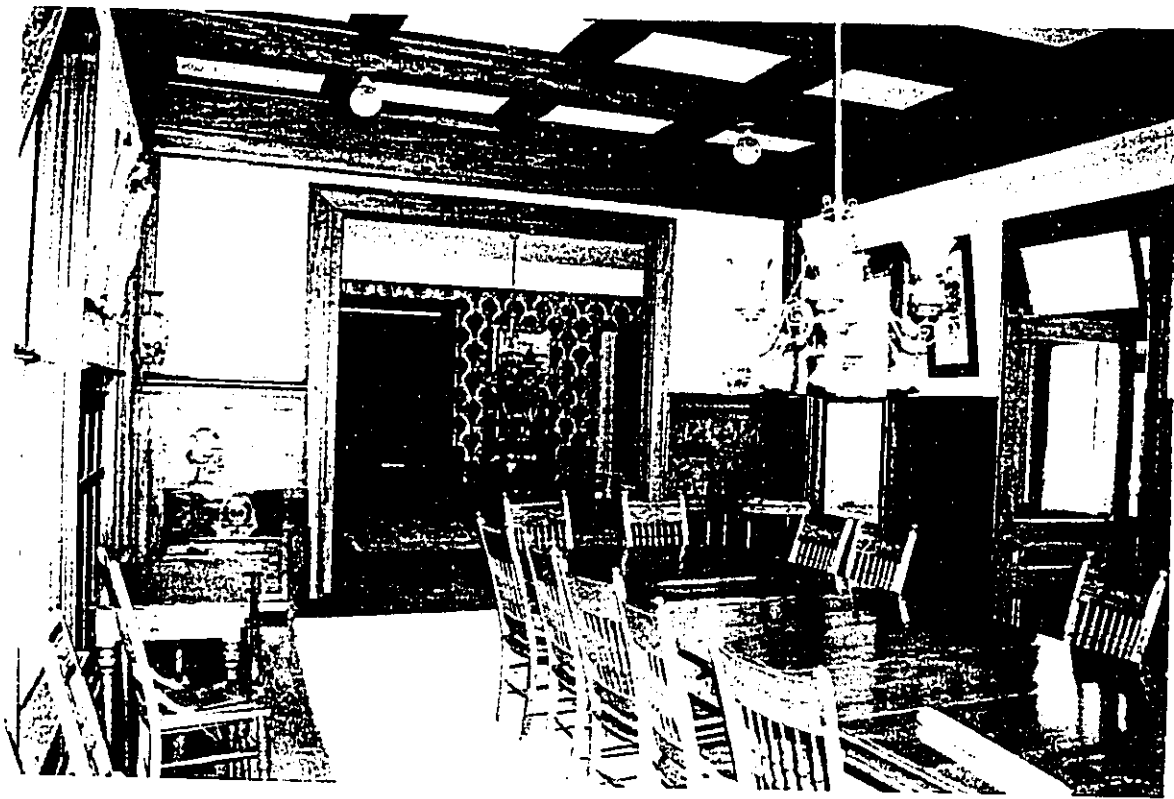


Photo 27 (top) - Ceiling at dining room
Photo 28 (bottom) - Furniture at library



Photo 29 (top) - China room
Photo 30 (bottom) - Cast iron stove at kitchen

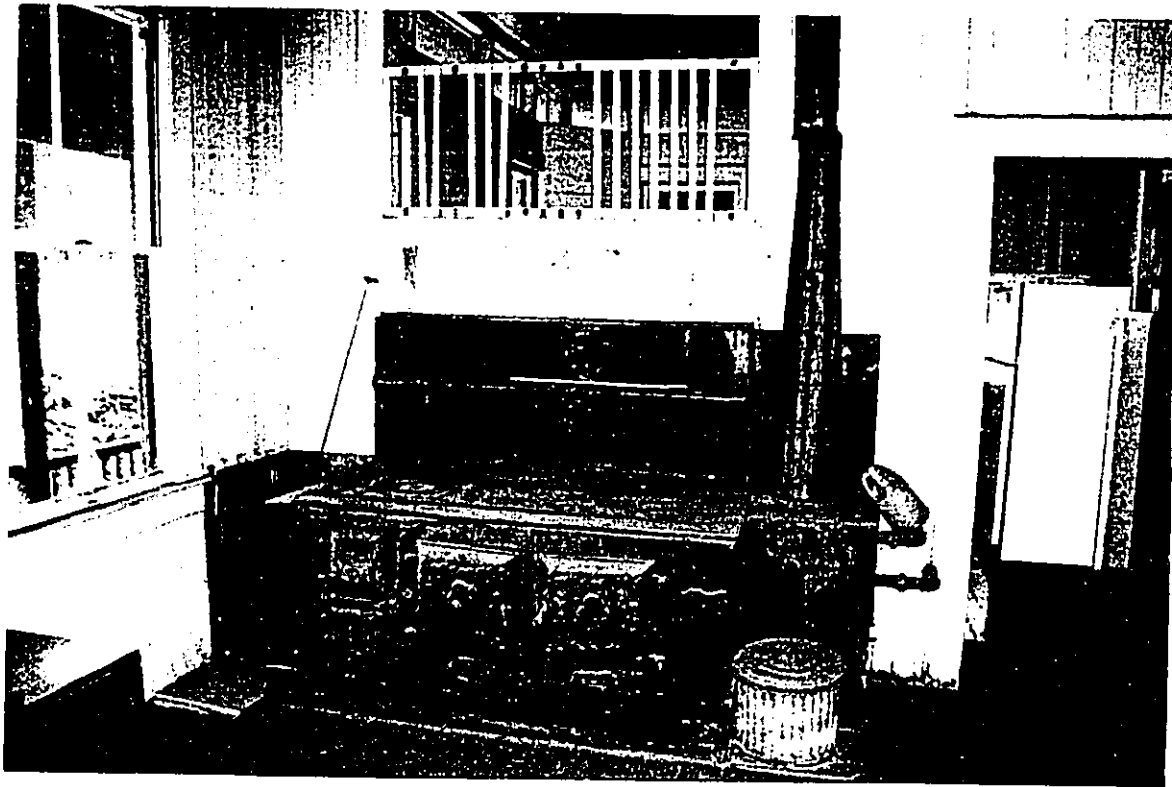


Photo 31 (top) - Exterior light fixture
Photo 32 (bottom) - Architectural elements at foundation

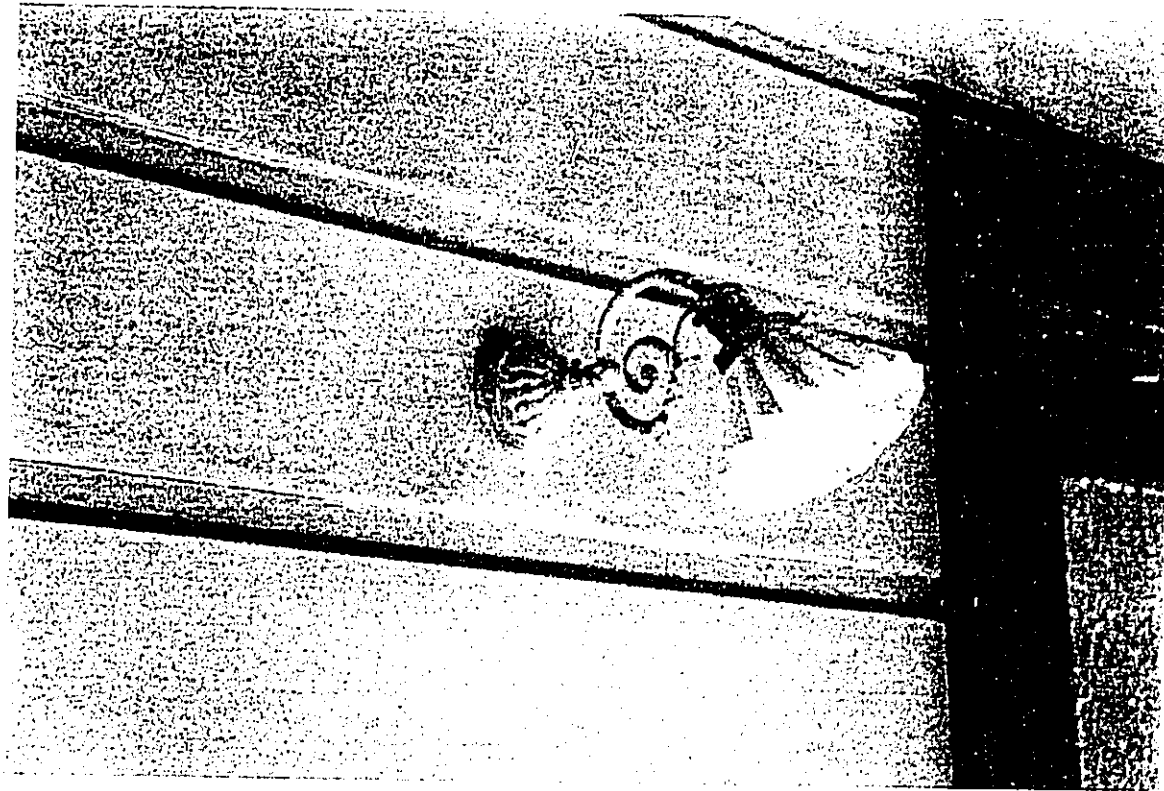


Photo 33 - Stored items in attic

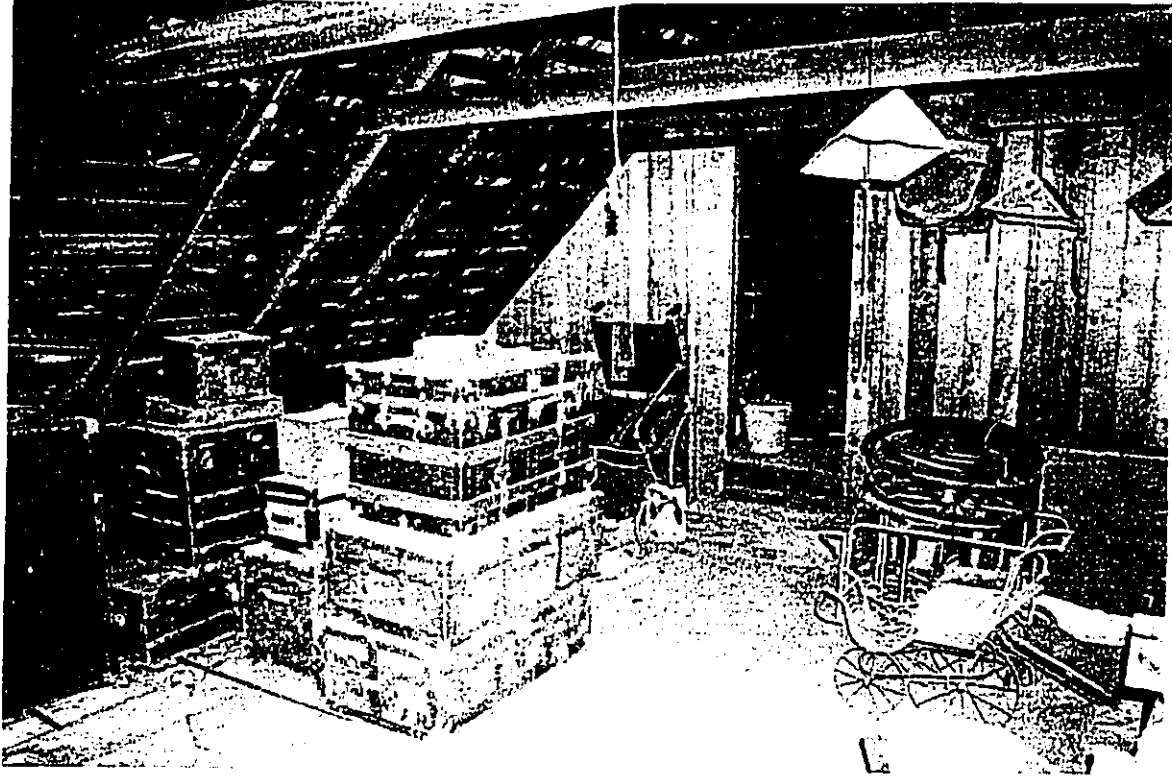


Photo 34 - Cottage, Front View
Photo 35 - Historical View of Cottage



Photo 36 - Office and Tack/Storage Building from Waimea side
Photo 37 - Tack/Storage/Office Building from mauka side

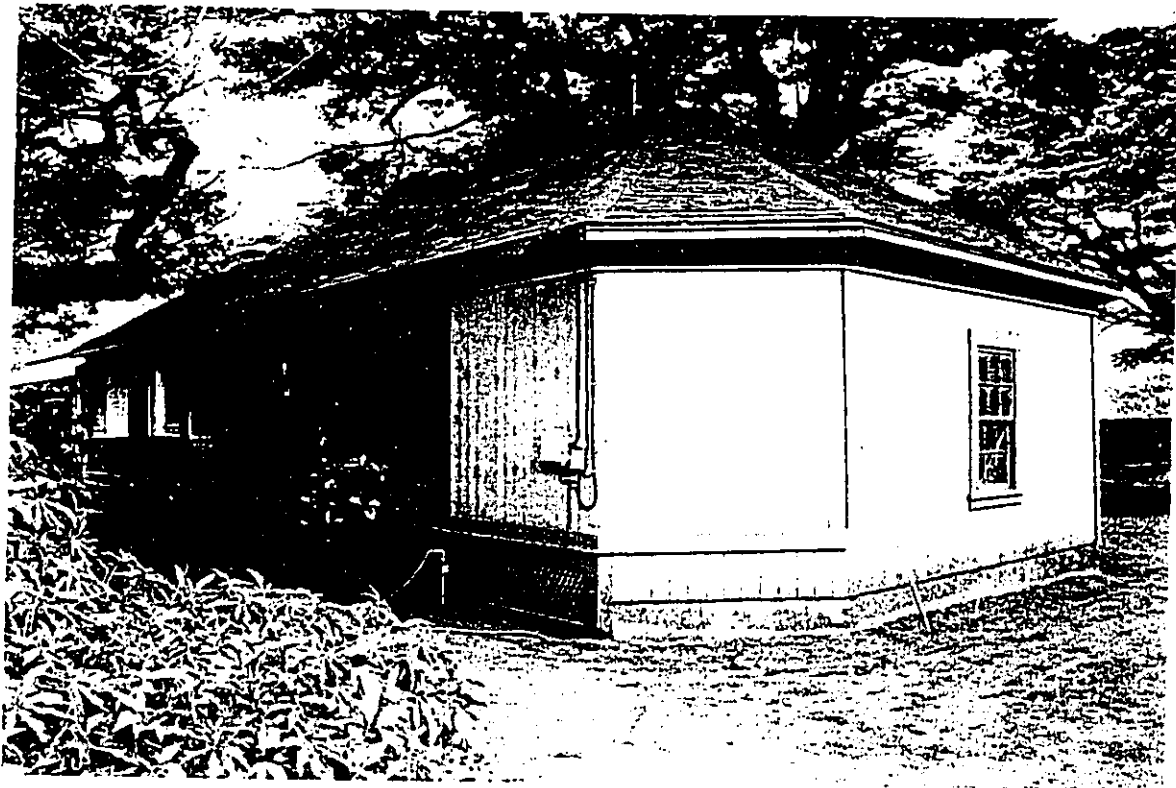
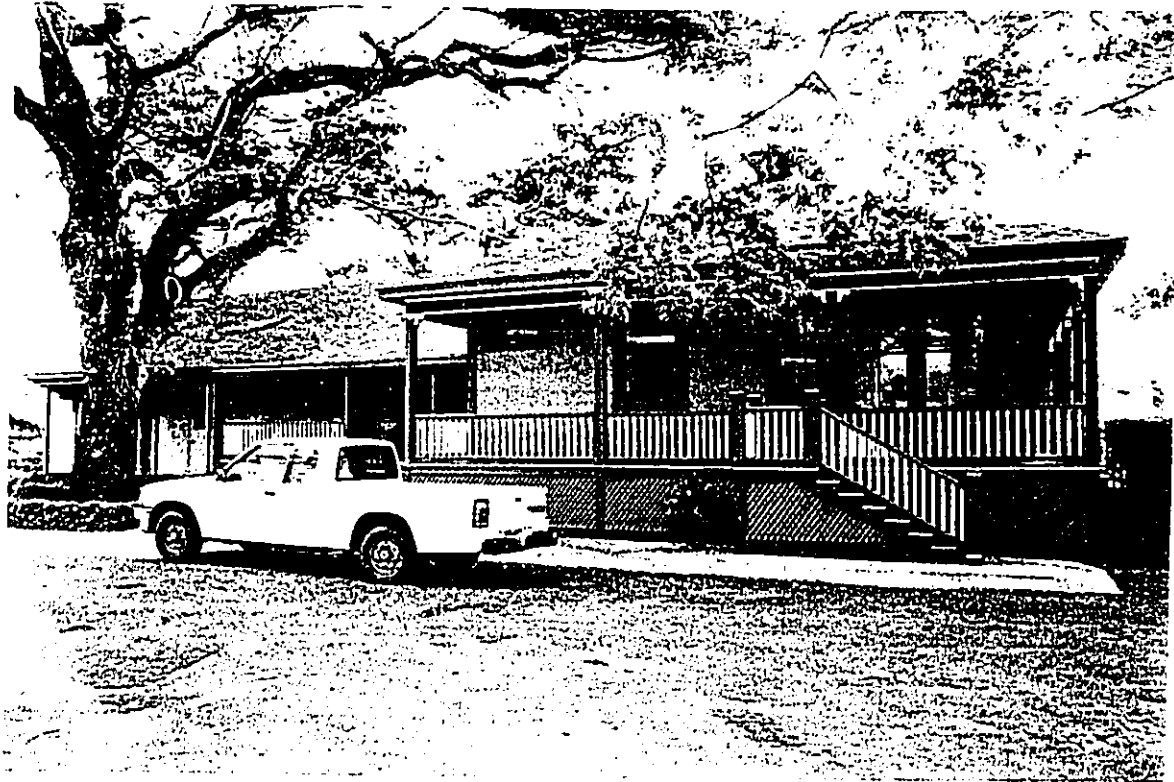


Photo 38 - Historical view of Garage Building
Photo 39 - Garage Building from makai side

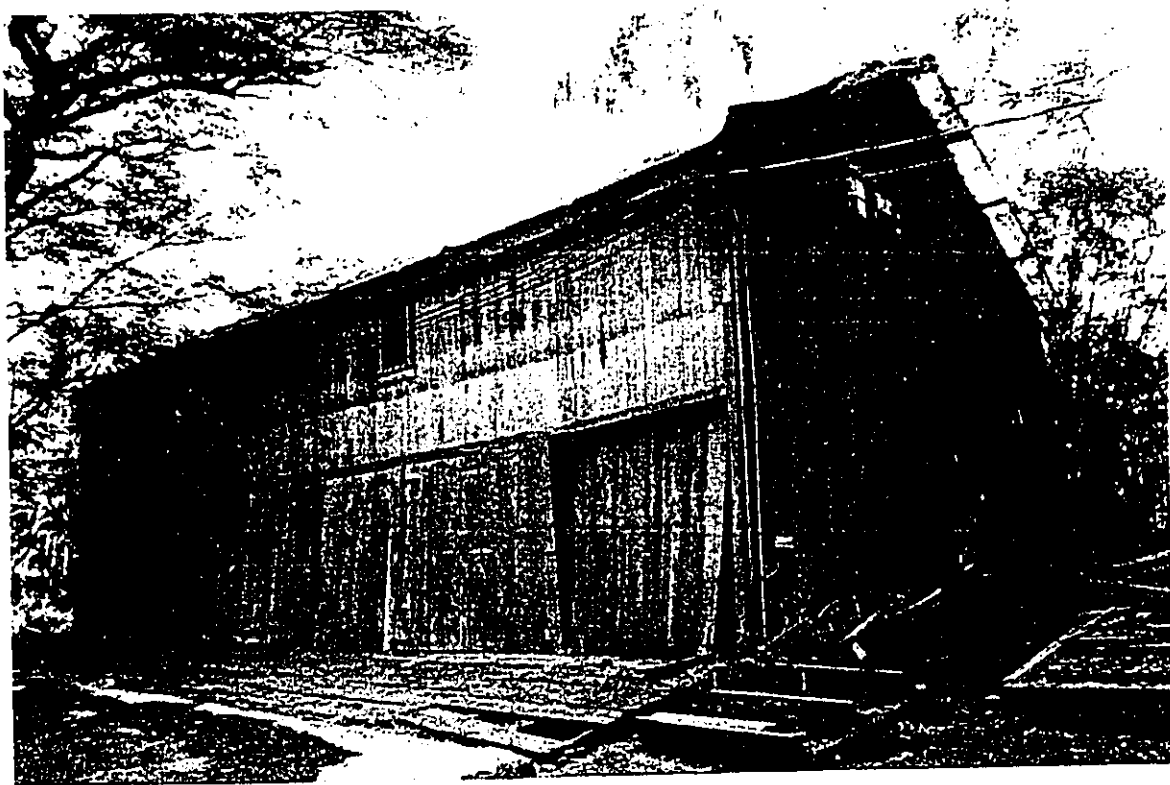


Photo 40 - Greenhouse from mauka side
Photo 41 - Water Tank foundation

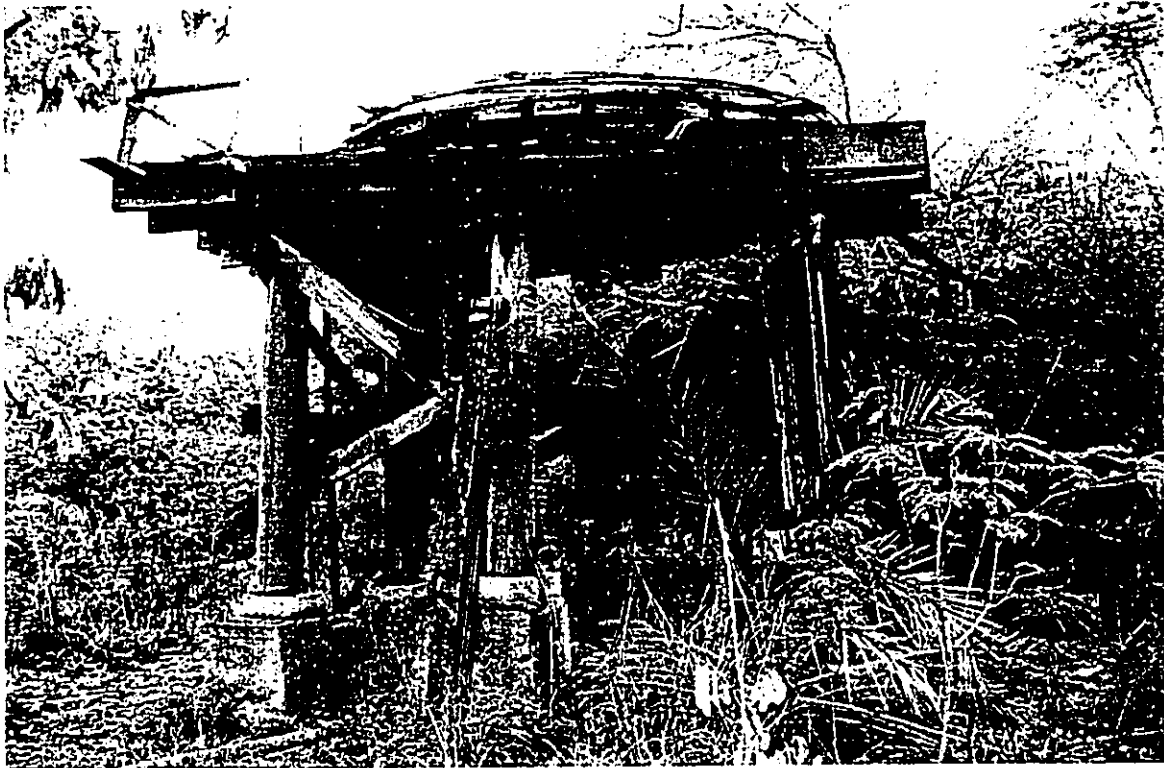


Photo 42 - Laundry/clothesline structure ruins
Photo 43 - Stove ruins at Laundry area

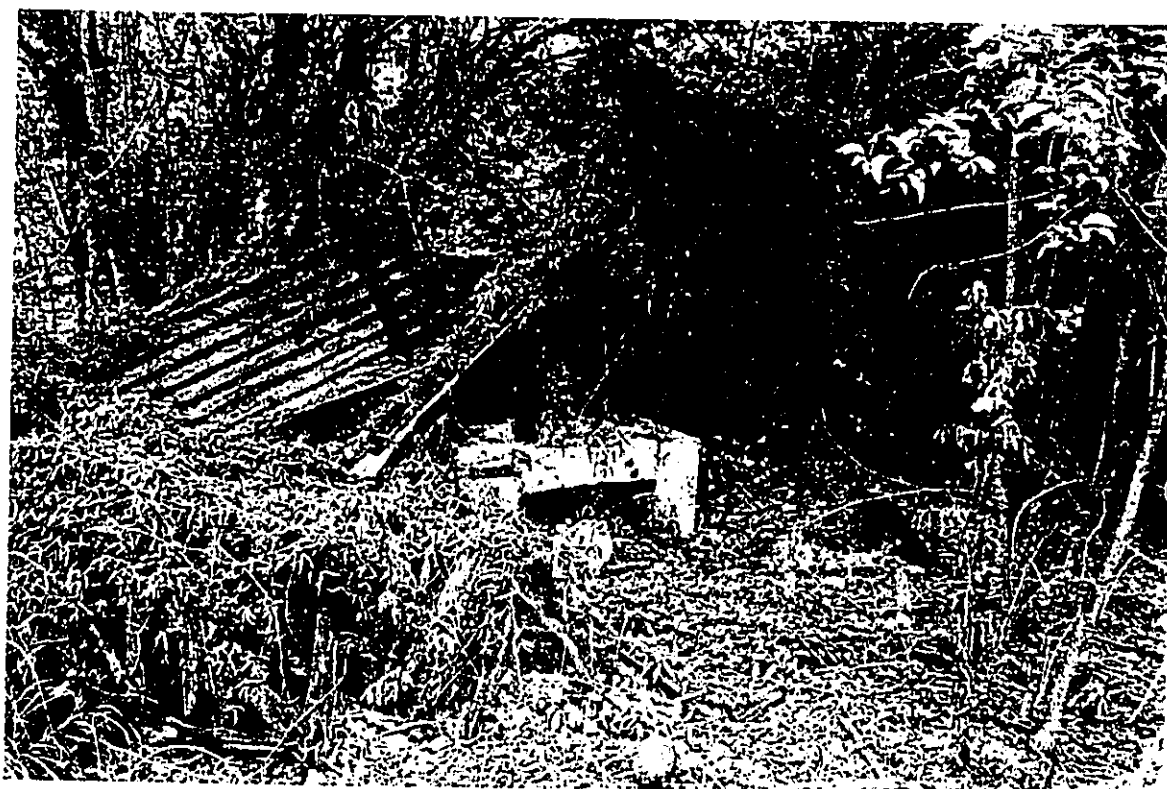


Photo 44 - Concrete slab near Laundry area
Photo 45 - Storage Building at garden area

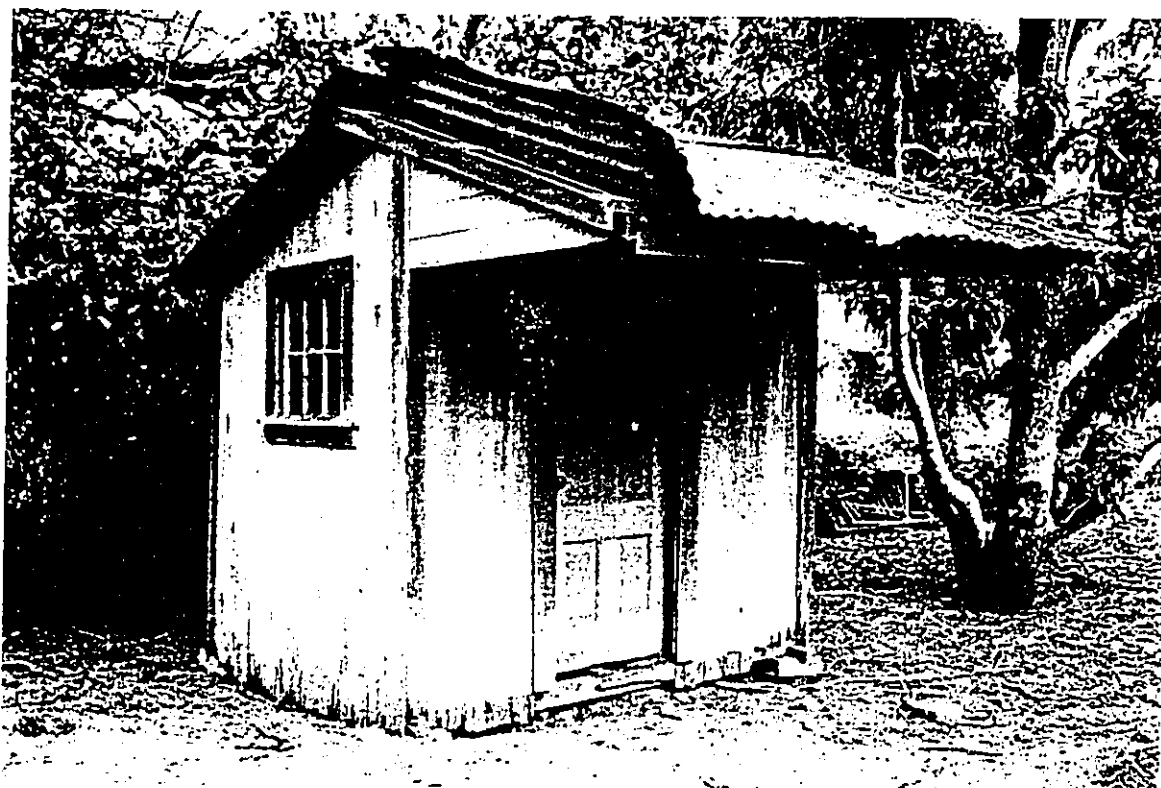


Photo 48 – House 5 (site 50-30-9-764, feature K)
Photo 49 – House 7 (site 50-30-9-764, feature M)

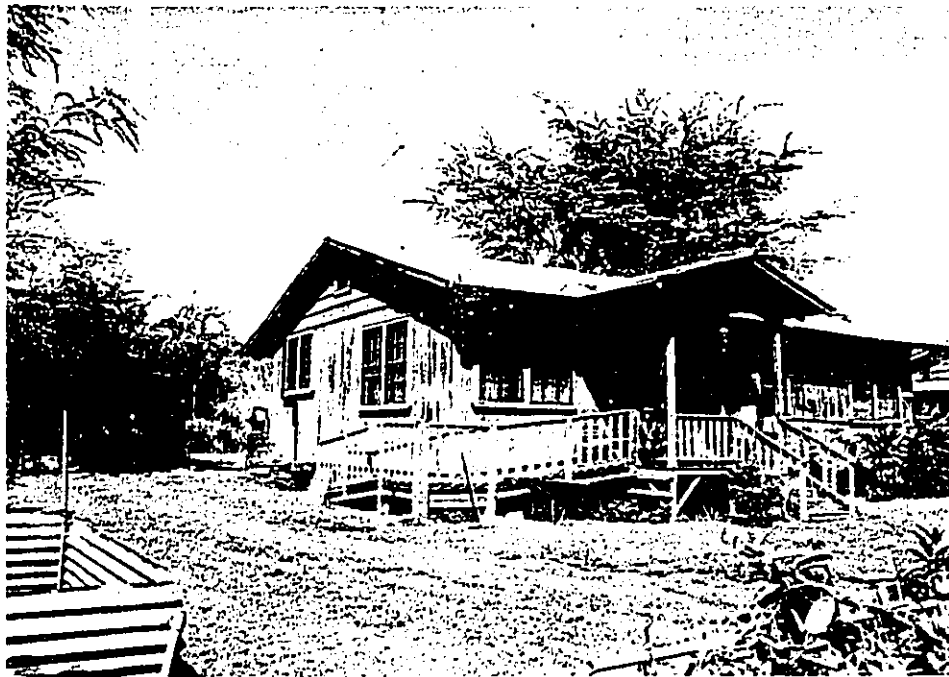


Photo 46 – Houses 2, 3, and 4 (site 50-30-9-764, features H, I, J)
Photo 47 – House 4 (site 50-30-9-764, feature J)



Photo 50 – Attached garage at House 3 (site 50-30-9-764, feature I)
Photo 51 – Interior of Living Room at House 5

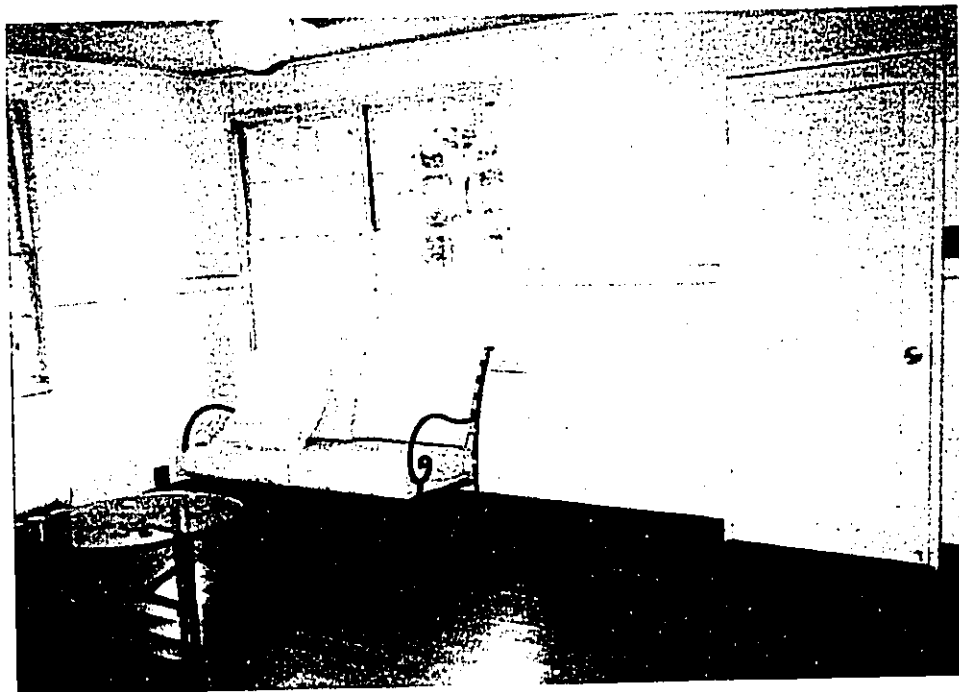


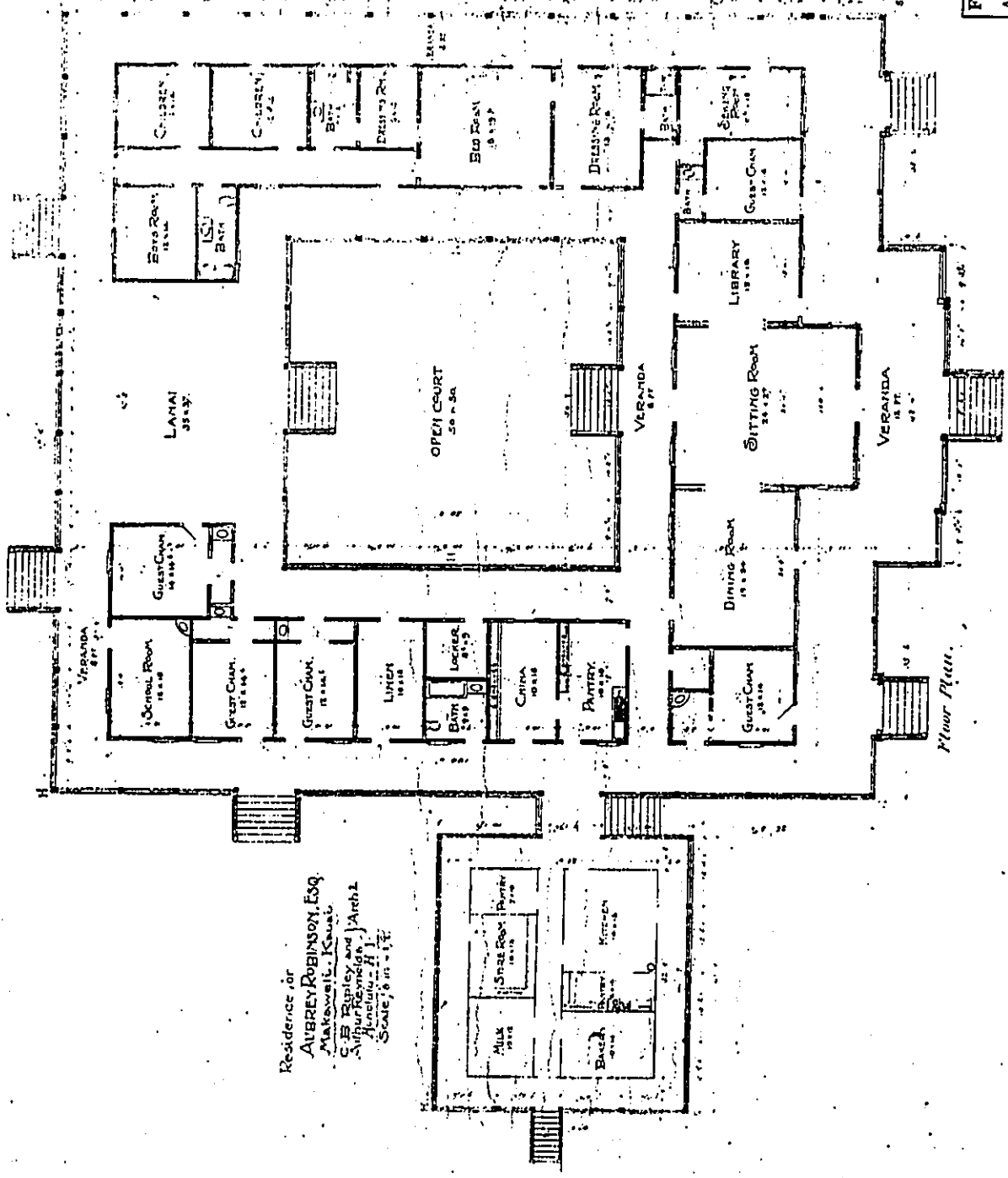
Photo 52 – Interior of Kitchen at House 6



PART 9 - DRAWINGS

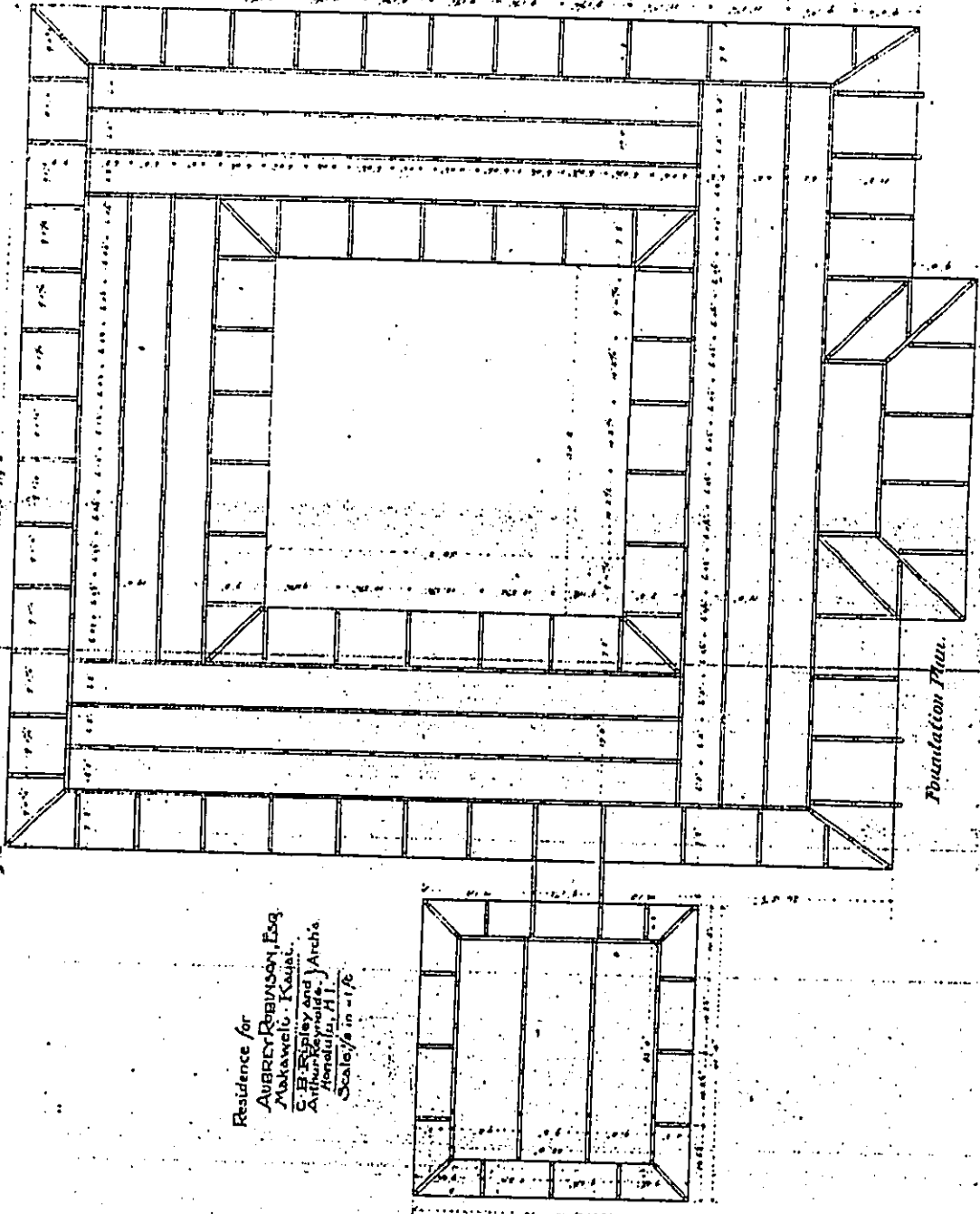
The original drawings, which include the main house and the attached kitchen building, are included here as Figures 1, 2, and 3. Drawings located are the floor plan, foundation plan, and elevations. Drawings were not found for the addition of the attached bedroom wing.

Additional drawings included are the Demolition/Repair plan (Figure 4), the Renovation plan (Figure 5), and Repair Elevations and Sections (Figure 6, 7, 8) for the proposed renovation/restoration of the main house, attached kitchen building, and attached bedroom wing.



Residence for
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 G. B. Robinson and Archt.
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 Scale, 1/8" = 1'-0"

FIGURE 1: Original Floor Plan
ARCHITECTURAL ANALYSIS OF
STRUCTURES AT KAPALA WAI
 Prepared by Mason Architects, Inc.

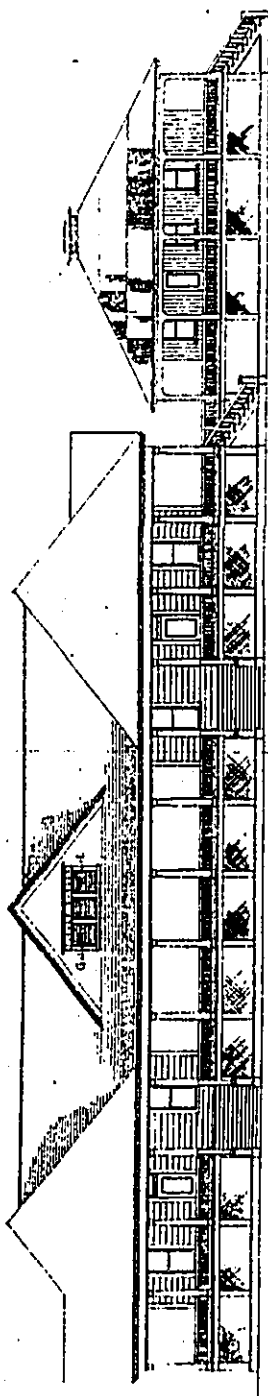
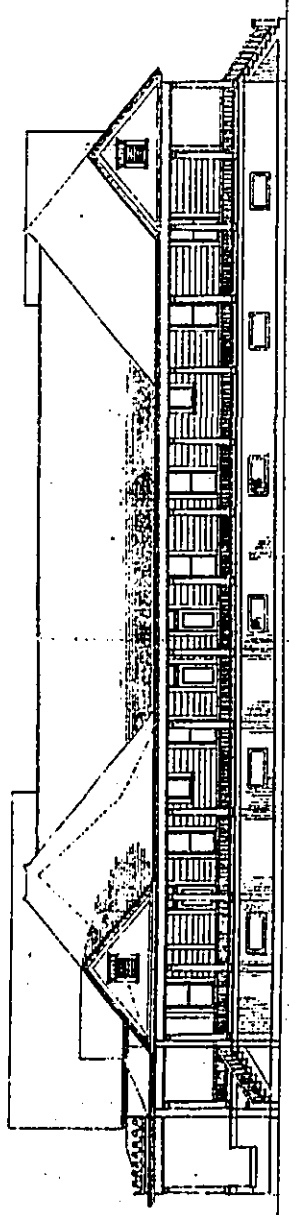
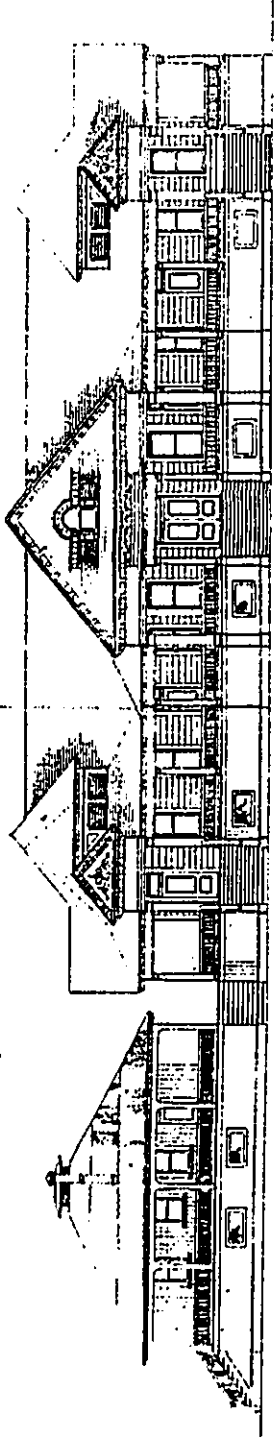


Residence for
 AUBREY ROBINSON, Esq.
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 C. B. Sperry and J. Archib.
 Honolulu, H. I.
 Scale: 1/8" = 1'-0"

Foundation Plan.

FIGURE 2: Original Foundation Plan
 ARCHITECTURAL ANALYSIS OF
 STRUCTURES AT KAPALAWAI
 Prepared by Mason Architects, Inc.





C. B. Ripley and
Arthur Reynolds,
Architects,
Honolulu, H. I.

Scale, 1/8" = 1'-0".

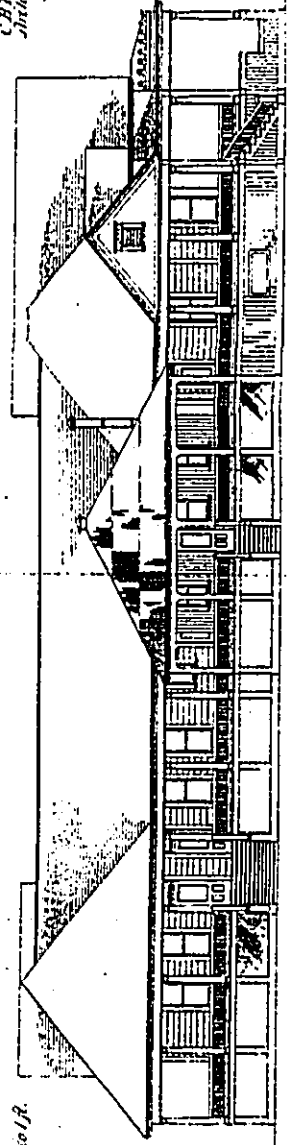


FIGURE 3: Original Elevations
ARCHITECTURAL ANALYSIS OF
STRUCTURES AT KAPALAWAI
Prepared by Mason Architects, Inc.

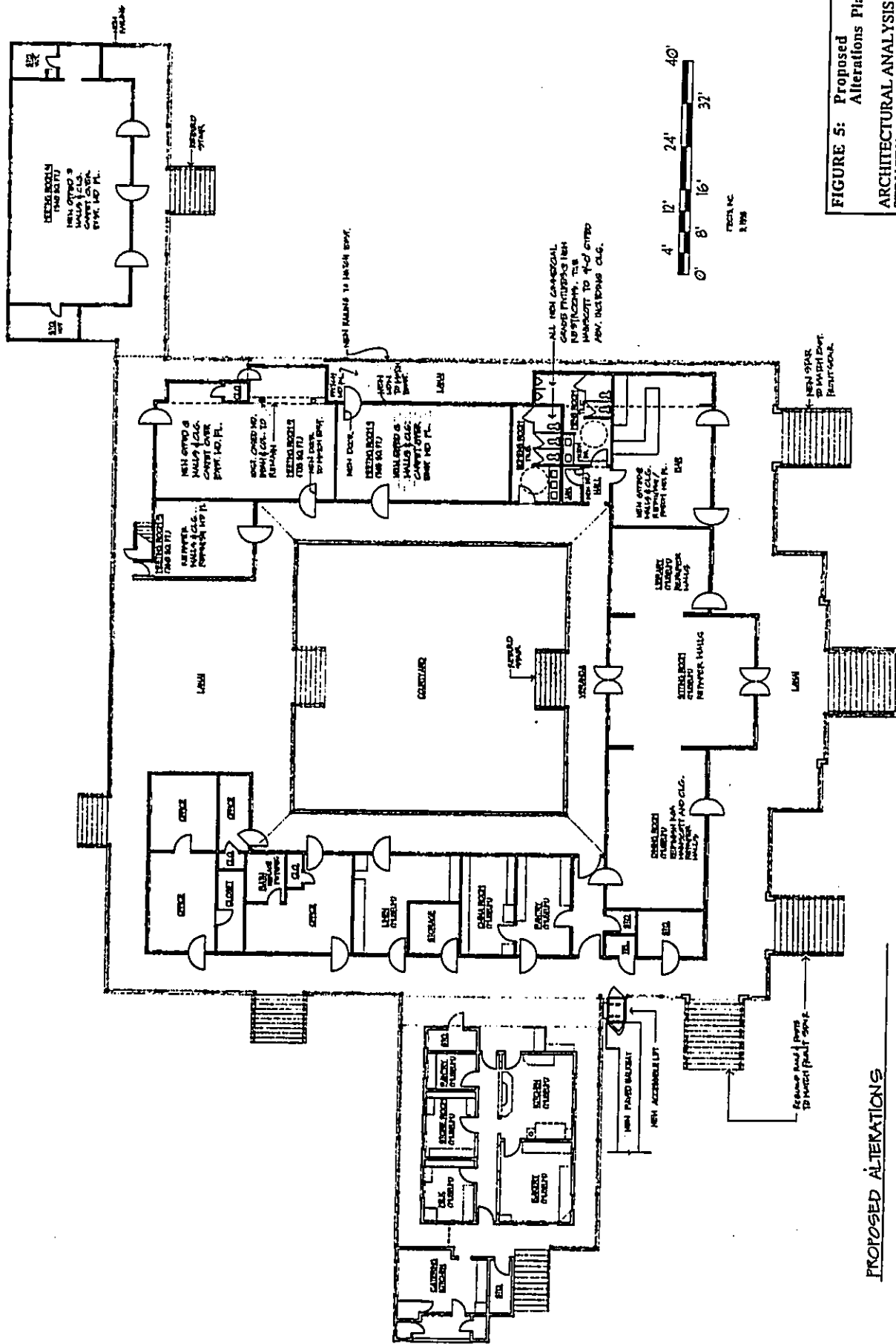
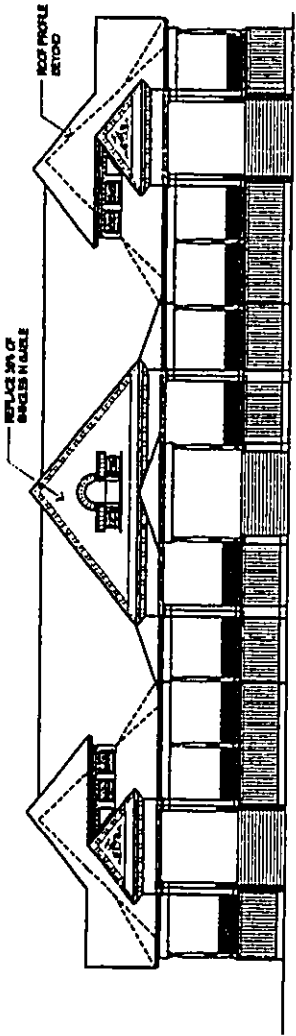


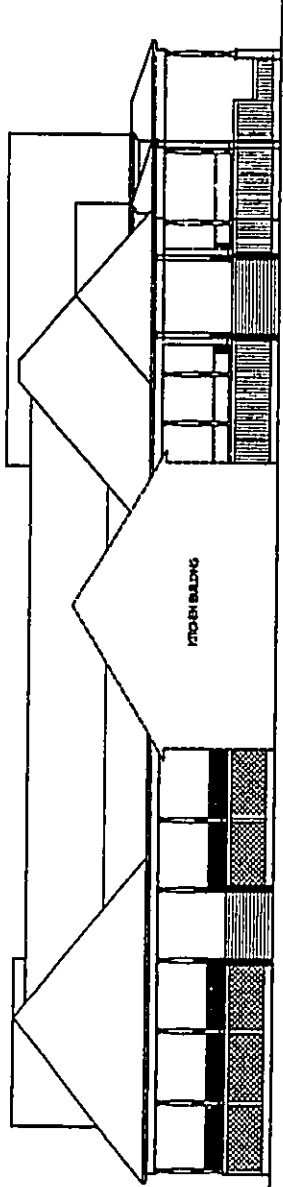
FIGURE 5: Proposed Alterations Plan
ARCHITECTURAL ANALYSIS OF STRUCTURES AT KAPALAWAI
 Prepared by Mason Architects, Inc.



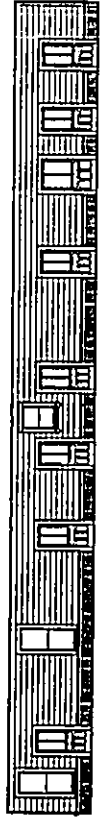
FRONT/MAKAI ELEVATION



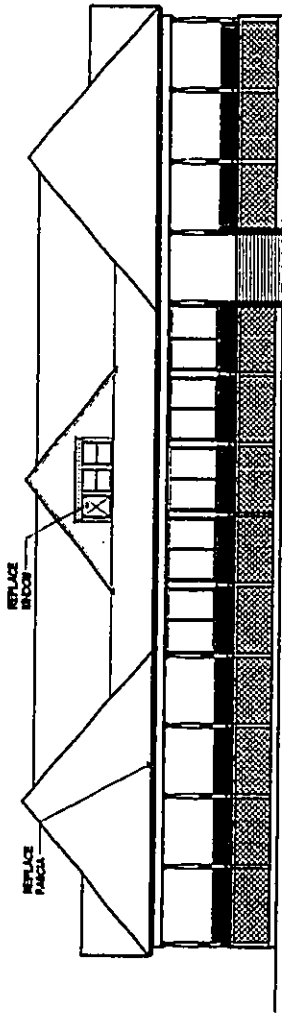
FRONT/MAKAI ELEVATION @ LANAI



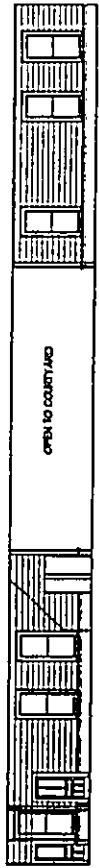
WAIMEA ELEVATION



WAIMEA ELEVATION @ LANAI



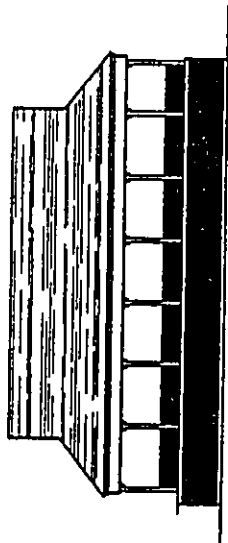
BACK/MAUKA ELEVATION



BACK/MAUKA ELEVATION @ LANAI

FIGURE 6: House Elevations
ARCHITECTURAL ANALYSIS OF
STRUCTURES AT KAPALAWAI
Prepared by Mason Architects, Inc.

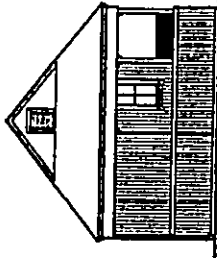




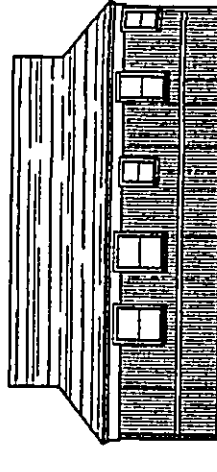
BEDROOM WING
FRONT/MAKAI ELEVATION



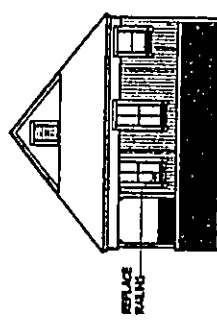
FRONT ELEVATION OF LANAI



BEDROOM WING
WAIMEA ELEVATION

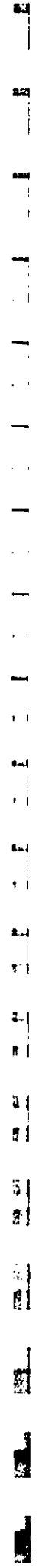


BEDROOM WING
BACK/MAUKA ELEVATION



BEDROOM WING
HANAPEPE ELEVATION

FIGURE 8: Bedroom Wing Elevations
ARCHITECTURAL ANALYSIS OF STRUCTURES AT KAPALAWAI
Prepared by Mason Architects, Inc.





Source: Cultural Surveys Hawaii, 1999

FIGURE 9: Site Map
ARCHITECTURAL ANALYSIS OF
STRUCTURES AT KAPALAWAI
Prepared by Mason Architects, Inc.



F

FISCAL/ECONOMIC
IMPACT ANALYSIS
MIKIKO CORPORATION



**Economic and Fiscal
Impact Assessment
for Kapalawai Resort**

Waimea District, Island of Kauai

July 22, 1999

Prepared for:

Helber Hastert & Fee Planners

2300 Pauchi Tower 1001 Bishop Street Honolulu, Hawaii 96813
Telephone 808 942 5493 Telefax 808 942 7638
Development planning and tourism advisory services in Hawai'i, Asia, and the Pacific

Mr. Scott Ezer
July 22, 1999
Page 2

- ◆ Personal income

2) Population impacts:

- ◆ On-site de facto population
- ◆ In-migrant resident population

3) Fiscal impacts:

- ◆ Property tax and other County government revenues
- ◆ Transient accommodations tax, excise tax, and other State government revenues
- ◆ County and State government operating expenditures
- ◆ County and State government net fiscal operating impacts

Estimates of State and County tax benefits and operating expenses stated herein are based on the structure of tax collections and government services in place as of June 29, 1999. The fiscal impacts estimated could differ if governmental taxing and spending policies were to be altered.

All dollar amounts in this report are stated in constant 1998 dollars unless otherwise stated.

DEFINITION OF TERMINOLOGY

Within this report, the following definitions apply:

- ◆ **Direct Impacts** - Those economic, population or other impacts attributable to persons or activities that are a direct result of a proposed development. For instance, direct employment impacts would include those involved in building the proposed facilities, such as construction workers, and those who would later work at them in their operations.

The majority, but not all of direct impacts can be expected to occur on-site. For instance, a portion of the construction budget for the development would be for architects and engineers who would design the facilities. While such persons' employment might be temporarily dependent on the contracts generated by Kapalawai, they may do the majority of their work from offices in Honolulu. Likewise, construction professionals working on-site would be supported by administrative and managerial staff located off-site.

- ◆ **Indirect Impacts** - Indirect impacts occur when the businesses or persons who are directly affected make expenditures for additional supplies or services. For instance, in order to offer fresh, local menu choices in Kapalawai's restaurants, the Resort is expected to buy produce and seafood from local farms, fishermen and/or ranching ventures. Kapalawai would thus have indirectly supported new business opportunities for area providers of such goods and services.

July 22, 1999

Mr. Scott Ezer
Helber Hastert & Fee Planners
Grosvenor Center, PRI Tower
733 Bishop Street, Suite 2590
Honolulu, HI 96813

Re: Economic and Fiscal Impact Assessment for Kapalawai Resort, Kauai

Dear Mr. Ezer:

Mikiko Corporation is pleased to present this assessment of the anticipated economic and fiscal impacts of the proposed Kapalawai Resort (hereinafter, "Kapalawai" or "the Resort") on the island of Kauai. This letter explains the background, objective and specific limitations of this study, and summarizes its findings. Following this letter are exhibits that present the detailed study analyses and conclusions. Also attached is a statement of pertinent general limiting conditions.

BACKGROUND AND STUDY OBJECTIVE

Destination Villages Kauai, LLC (DVK) proposes to develop a 250-bungalow resort on 170 acres of land in Kapalawai, Kauai. The development and its anticipated market support are described in detail in Mikiko Corporation's May 21, 1999 report, "Market Assessment for Kapalawai Resort" (hereinafter, "the market study").

This document presents the results of an economic and fiscal impact analysis for the development of Kapalawai. The analysis is conducted for the State of Hawaii (State) and the County of Kauai (County). This assessment is based on performance assumptions derived from the market study, as well as on development cost and other assumptions and supporting data provided by DVK and/or Helber Hastert & Fee Planners (HHF).

Impacts that were evaluated include the following:

- 1) Economic impacts:
- ◆ Visitor expenditures
 - ◆ Construction employment
 - ◆ Operational employment

- ◆ **Induced impacts** - Induced impacts occur throughout the community when those persons who have benefited from the direct or indirect impacts of Kapalawai spend their associated earnings on consumer goods and services. For instance, a construction worker may spend her earned wages to buy a new pair of shoes, or to pay for her child's day care. The farmer who sells produce to Kapalawai may use his business income to take his family out to the movies. The businesses impacted by such re-spending are said to enjoy induced economic impacts from Kapalawai.
- ◆ **Total impacts** - Total impacts are defined as the sum of direct, indirect and induced impacts for any given variable.
- ◆ **Resident population** - Resident population refers to all those persons who habitually reside in a given area, whether or not they may have temporarily traveled away.
- ◆ **De facto population** - De facto population refers to those persons physically present at a given time. For instance, the de facto population of Kawai includes all tourists and residents who are on the island at a given time, but it excludes residents who have traveled off-island that day. It also includes those who are residing on Kawai only short-term, for instance a Maui resident who is employed as a construction specialist at the site for a month.
- ◆ **Full-time equivalent** - Although some direct, indirect and induced employment opportunities generated by Kapalawai can be expected to be part-time and others to be on-call, this study measures employment opportunities in full-time equivalent (FTE) units. For purposes of this study, one full-time equivalent position is defined as 2,080 hours of employment (including paid vacation, sick leave, etc.) per year. This is equivalent to 40 hours per week, and may also be referred to as a "person-year" of employment. Thus, two half-time jobs are considered to together represent one FTE job.

DEVELOPMENT OVERVIEW AND TIMING (Exhibit A)

Specific assumptions regarding the scale, nature and timing of Kapalawai are made in order to assess its impacts. For purposes of this assessment, the following timeline is assumed:

- ◆ The development period extends from January 1 to December 31, 2001. The study assumes that final discretionary land use entitlement(s) (County Zoning Amendment and/or Special Management Area Use Permit) are obtained in January 2001. Thereafter, final design and engineering studies and all construction are assumed to be completed within the year.

- ◆ The operations period begins with the assumed opening of the Resort on January 1, 2002. This study projects the economic and fiscal impacts of the project for two years thereafter, to an assumed "stabilization" of operations in 2004.

The currently on-going entitlement process is already generating significant economic and fiscal benefits by employing professionals throughout the State and generating business travel to the State and to Kawai. However, since such benefits are not dependent on the outcome of the entitlement process, they are not included in this analysis.

Bungalow occupancy is estimated to average 65% and 70% in the first two years of operations, respectively, and then to stabilize at about 75% by 2004, based on the market study findings. Occupied bungalows are projected to house an average of 1.95 visitors, which represents the average party size for visitors to the island of Kawai in 1997¹.

According to HHF, slightly more than half of the site could be developed with resort-type facilities, while the remaining approximately 80 acres would consist of undeveloped areas such as shoreline and highway setbacks, and conserved areas including a large fishpond.

ECONOMIC IMPACTS

Kapalawai could be expected to impact the State and Kawai economies by (1) attracting visitors who would make new expenditures, (2) generating construction activity, which would support expenditures for goods and services, and (3) creating and supporting jobs and business enterprises in its ongoing operations. The new jobs would in turn generate additional personal income in the County and throughout the State.

Visitor Expenditures (Exhibit B)

The anticipated mix of types of visitors staying at Kapalawai is based on the findings of the market study. This study assumes the following average mix by direction of travel:

- ◆ Westbound visitors - 75%
- ◆ Eastbound visitors - 5%
- ◆ Hawaii residents - 20%

The Hawaii residents or *kama'ainas* are not expected to contribute significant new expenditures to the State, since it is assumed their vacation budgets would have been spent elsewhere in the islands even if Kapalawai did not exist. To the extent local residents choose to stay within the State for their budgeted vacations because of Kapalawai, this assumption underestimates the project's

¹ Hawaii Visitors & Convention Bureau, "1997 Annual Research Report," Table 31. In 1996, Kawai's average visitor party size was 1.88.

benefits and is therefore considered conservative. However, the Resort's unique vacation opportunities may result in some *kama'ainas* vacationing on Kauai rather than other islands of the State. Thus for purposes of projecting County impacts that stem from visitor population levels, 50% of the Resort's *kama'aina* visitor mix is assumed to be persons who would not have otherwise stayed on Kauai.

- ◆ **Bungalow expenditures** – Bungalow revenues are projected to represent some \$8.8 million in 2002, increasing to \$10.7 million by 2004 as operations stabilize. This is based on the estimated achieved rate of \$185 per room night in 2002. Thereafter, real dollar increases of 3% per year are assumed until stabilization in 2004.
- ◆ **Other expenditures** – Other expenditures from the anticipated out-of-State visitor markets are based on the 1997 average daily expenditures of westbound and eastbound travelers to the State, adjusted to 1998 dollars and considering exchange rate changes. Based on this analysis, eastbound visitors are projected to spend some \$186.00 per person per day on items such as food and beverages, retail, entertainment, activities, inter-island travel and the like. Likewise, westbound visitors to Kapalawai could spend some \$91.50 per person per day on non-lodging items and services.

On average then, the typical Kapalawai visitor is projected to contribute \$78 per day to the State's economy. This figure is averaged across the 20% local resident visitors, whose contribution to the State economy is evaluated as being negligible, as discussed above. Considering only out-of-State visitors to Kauai, non-lodging expenditures are expected to average approximately \$98 per day. These expenditures are in addition to the parties' expenditures for accommodations, and are shown near the top of Exhibit B.

Considering only Kapalawai's out-of-State visitors, the \$98 in non-lodging expenditures per day could support some \$9.1 million in new visitor spending by 2002, or \$10.5 million per year upon stabilization of operations.

- ◆ **Total direct expenditures** - In total, direct visitor expenditures are estimated to represent \$17.8 million in 2002, increasing to some \$21.2 million by 2004, in 1998 dollars. Including the indirect and induced multiplier effects within the State, visitors attracted by Kapalawai could account for over \$36 million in new annual visitor expenditures by the time of project stabilization.

Construction Expenditures (Exhibit C)

DVK estimates an approximately \$33 million budget to develop Kapalawai, to be expended in 2001. The budget is in current dollars and includes:

- ◆ **Professional services** – architectural, engineering, landscape design, legal, and similar services.
- ◆ **Bungalow construction** – including materials and labor, but excluding the furnishings, fixtures and equipment associated with the bungalows.
- ◆ **Support facilities construction** - support and "back of house" facilities, including the boardwalks, landscaping, swimming pools, restaurants and snack bars, renovation of the historic home on site and development of a museum there, meeting spaces, and the like. These estimates also exclude furniture, fixtures and equipment that may be purchased for the facilities.
- ◆ **Infrastructure construction** – all costs related to infrastructural developments such as sewage, utility and cable lines, walkways, roads, parking and the like.

Development Employment and Income (Exhibits C and D)

Development of Kapalawai is estimated to require about 280 person-years of labor, as shown in Exhibit C. While the majority of this work would occur on-site, some, such as the professional services and administrative positions related to construction, are likely to be primarily located off-site. Many of the latter might be located elsewhere on Kauai, or on Oahu. This estimate includes proprietary employment opportunities supported by the project's development.

Direct personal income associated with these Hawaii-based positions could total about \$15.7 million, as shown in Exhibits C and D.

Total wage, salaried and proprietary employment associated with construction of Kapalawai, including induced and indirect positions could total about 710 person-years, as also shown in the exhibit. The indirect and induced positions could be supported throughout the State, but many would be located on Kauai.

Including its direct, indirect and induced impacts, the project's development could support some \$30.2 million in wage, salaried and proprietary incomes for Hawaii residents.

Operational Employment and Income (Exhibit E)

In addition to its development-related positions, Kapalawai would support many long-term permanent jobs in its operations. Direct operational jobs are projected to stabilize at about 200 FTE positions, as shown in Exhibit E. These new employment opportunities could include a variety of types and levels of work, including opportunities in management, sales and marketing, registration/reservation, human resources, food service, maintenance and engineering, housekeeping, landscaping and activities. The majority of such jobs would be located on-site.

Based on economic multipliers derived from the State's 1992 Input-Output Study (dated December 1998), the total employment impacts of Kapalawai, including its indirect and induced jobs, could represent about 320 FTE positions throughout the State.

Direct wages and salaries paid to those employed in the Resort's operations are expected to reach about \$5.3 million in 1998 dollars. Including personal income associated with the indirect and induced positions, the project could generate nearly about \$12.3 million per year in ongoing payroll within the State. These figures do not include the potential profits of proprietors whose businesses could serve Kapalawai, nor do they include employee benefits.

POPULATION IMPACTS (Exhibit F)

Development of Kapalawai could affect population in several ways:

- ◆ It is expected to attract new travelers to the State, primarily staying on-site.
- ◆ Construction and operational employment opportunities would lead to new de facto population on-site.
- ◆ Some of those taking advantage of the construction and operational employment generated by Kapalawai might move from other counties or states because of the job opportunity, thus increasing the Kauai County and/or Hawaii State resident population levels. Other household members might also accompany such in-migrating persons.

On-site Population

Based on the 250 bungalows and the occupancy assumptions presented previously in Exhibit A, Kapalawai could be expected to accommodate an average of about 365 visitors per day once it reaches its anticipated stabilized occupancy level of 75%. On average, Kapalawai could also have

around 240 construction workers on-site on any given day in 2001, and 143 operational employees per day after opening in 2002.

These figures represent the total number of persons anticipated to be on-site over a 24-hour period. In any given hour, there would likely be fewer persons present on-site, since some visitors would be visiting attractions off-site, and the workers would be scheduled in shifts rather than all at once.

Off-site Population: In-migration to the State (Exhibit F)

Kapalawai is not anticipated to lead to any significant migration from out-of-State, as discussed below. However, to the extent persons do move to the State because of its development, such in-migrants can be expected to reside in housing or transient accommodations located off-site.

- ◆ **Construction:** Hawaii's labor market is considered to have sufficient supply and the required skills to satisfy virtually all of Kapalawai's construction labor needs. However, a nominal number, or 1% of FTE staffing needs are assumed come from the U.S. mainland. Such persons would be temporarily resident on Kauai during the project's development.
- ◆ **Operations:** Recent hotel openings on Kauai have been directly associated with little if any in-migration of persons from out-of-State. The Human Resource Managers at the 413-room Sheraton Kauai Resort and the 216-room Holiday Inn SunSpree, which opened in December 1997 and November 1998, respectively, were interviewed regarding the amount of in-migration associated with their hiring. In both cases, no "in-migration" employees are known to have moved from out-of-State due to their employment opportunities. Only two management personnel at the Sheraton may have moved due to the employment opportunity. This represents from 0% to 0.6% of the total employees at each hotel. For purposes of this analysis, 1% of Resort employees were assumed to move to Kauai from out-of-State due to their employment opportunity at Kapalawai.
- ◆ **Dependents:** In-migrant dependents are estimated at an average of 0.2 per FTE in-migrant construction worker (since the position on which the "move" is based would be temporary), and 1.0 per FTE in-migrant operations employee.

Off-site Population: In-migration to the County (Exhibit F)

Kapalawai's construction is likely to be associated with a temporary movement of employees between islands, but its operations are expected to be staffed predominantly by prior island residents, as discussed below.

- ◆ **Construction:** The amount of off-island construction labor Kapalawai will attract would be dependent on factors such as how the project is bid, the bonding capacity and other on-going

activities of Kauai-based general contractors at the time, the general contractor's criteria for selecting subcontractors, and other factors that are beyond prediction. Discussions with Kauai construction industry professionals and the head of the Contractors' Association of Kauai indicate, however, that there are general contractors on Kauai with the capacity to bond a construction project of this size. These contacts also estimated that the ultimate staffing for the Resort's construction could vary from about 60% to 75% Kauai residents, assuming the general contractor is from the island. Based on this input, the projections assume that 30% of construction workers employed on-site at any given time would be from off-island.

- **Operations:** The openings of the Sheraton Kauai and the Holiday Inn SunSpree discussed on the previous page are estimated to have drawn about seven or eight employees each from other islands. This represents 2.5% of all employees at the Sheraton, and 6% of those at the Holiday Inn. For purposes of this analysis, 5% of Resort employees were assumed to move to Kauai from other Hawaiian islands due to their employment opportunity at Kapalawai.
- **Dependents:** As for the State, each in-migrating construction employee is anticipated to be accompanied by an average of 0.2 dependents. This could represent a spouse, child or friend visiting from off-island on some weekends. On average, each in-migrant operations employee is assumed to be accompanied by 1.0 dependent.

FISCAL IMPACTS

Kapalawai's fiscal impacts are estimated by comparing the project's anticipated government revenues to the government service costs associated with the additional population Kapalawai may attract to the State and to the County.

Additional County Real Property Tax Revenues (Exhibit G)

For the County, the most significant fiscal impact of the Resort is likely to derive from the higher real property taxes it would generate compared to those paid under its current land use designations and level of development. Once developed, the majority of the site is likely to be taxed based on its resort use, according to discussions with personnel at Kauai County's Real Property Tax Division. However, facilities earning a significant share of revenues from persons not staying at the Resort are likely to be taxed as commercial property. This analysis assumes the main restaurant located near to the fishpond is taxed as commercial property².

² Since the tax rates for Hotel/Resort and Commercial use properties are the same in Kauai County, this distinction does not have a significant impact on the total amount of real property taxes projected.

Net new real property taxes at the site are based on Kauai's Fiscal Year 1999/2000 rates, as adopted by the County Council in May 1999. The Resort/Hotel and Commercial tax rates are the same, both representing of \$8.40 per thousand dollars assessed value of improvements, and \$8.80 per thousand assessed value of land.

The assessed values of the lands after their assumed new entitlements in January 2001 are based on comparison to assessed values at other projects on the island, and recent property transactions. The assumed values of the improvements are based on the construction costs shown previously in Exhibit C, and exclude professional services. Assuming entitlements are received in 2001, the properties would be reassessed under the new land use designations as of January 2002. Therefore, the new real property tax classifications would be applied in the next fiscal year, which would begin July 1, 2002.

In 2001 and the first six months of 2002 (prior to its taxation under the new designations), the property is assumed to continue to pay real property taxes based on its current designation as Agricultural and Conservation lands with minimal development.

After adjustments for the nominal property taxes now paid at the site, Kapalawai is anticipated to generate approximately \$420,000 annually in net new property tax revenues by 2003.

Total New County Government Operating Revenues (Exhibit H)

In addition to real property taxes, Kauai County is allocated a share of the transient accommodations taxes (TAT) collected by the State, and it obtains liquid fuel, utility franchise, motor vehicle weight, and other licenses and permit fees from residents and businesses.

Given the bungalow revenues projected to be generated by out-of State visitors to Kapalawai, the State's 7.25% TAT, and Kauai County's current 6.5% share of State TAT collections, this could represent some \$50,000 in annual TAT revenues for the County by 2003.

Those persons who move to the County because of the project would also pay additional liquid fuel, utility franchise, motor vehicle and other minor County taxes. These miscellaneous tax sources could represent a nominal further increase in County taxes attributable to Kapalawai.

In summary, net new taxes earned by the County as a result of Kapalawai's development and operations could represent some \$480,000 per year on an on-going basis by 2004. These figures are in 1998 dollars, and are reflected in Exhibit H.

³ TAT paid by home owners staying at the Resort are not considered an additional impact, since home owners are assumed to vacate elsewhere in the State even if Kapalawai is not opened.

Additional State Government Operating Revenues (Exhibit I)

Additional operating revenues accruing to the State government are expected to derive principally from the general excise tax (GET) accruing from out-of-State visitors' expenditures in Hawaii. Other sources of new State revenues attributable to Kapalawai include its share of the TAT, as well as GET, income and other taxes paid by those who move to the State because of the project, and GET on its development costs.

Taxes paid by households that move to the State were adjusted downward from their historical levels to reflect the income tax rate reductions implemented by the State Legislature in 1998. These projected individual income taxes and other revenue sources from in-migrants are considered conservative because the overall figure was adjusted downward based on changes in State income tax levels, whereas the total figure includes specific excise and other taxes as well.

In total, new operating revenues for the State are estimated to amount to some \$1.3 million annually by project stabilization in 2004, as shown at the bottom of Exhibit I. The projected State tax revenues may be conservative in that they do not include:

- ◆ Potential income taxes from proprietary operating income, including those that may be paid by the operating entity for Kapalawai.
- ◆ GET or possible income taxes on ground lease rents earned by the landowner, or
- ◆ The State surcharge on motor and tour vehicles that would be rented by Kapalawai visitors.

Per Capita Government Operating Expenditures (Exhibits J and K)

Both State and County governments can be expected to incur additional operating expenses in supporting the in-migrants that are attracted by Kapalawai. An analysis of the County's 1995/96 fiscal year expenditures suggests that the County spends some \$1,900 per resident per year, and about \$1,170 per full-time equivalent visitor-year, in 1998 dollars. These expenditures support services ranging from public safety and highways to recreation and cash capital improvements, as shown in Exhibit J.

A similar analysis of State government operating expenditures per capita suggests that the State spends about \$4,970 per year to support government operations on behalf of each resident, and \$1,840 per full-time equivalent visitor-year, in 1998 dollars, as shown in Exhibit K.

Additional County and State Government Operating Expenditures (Exhibit L)

Applying these per capita budgets to the number of visitors and those anticipated to in-migrate to the County because of employment opportunities at Kapalawai results in an estimated \$420,000 per

year in additional County government operating expenditures by the time of project stabilization in 2004⁴.

Employing an analogous methodology, the State could be expected to require up to \$560,000 per year to support the visitors and residents attracted by Kapalawai, in 1998 dollars. These figures are shown at the bottom of Exhibit L.

For purposes of estimating government costs associated with additional population, the construction workers and their dependents are treated as "non-residents." This is because their temporary presence on the island or in the State is not likely to lead to additional government expenditures in categories such as public education, public welfare, unemployment, retirement and pension policies, and the like. Rather, they are more likely to burden the County and State governments like visitors do, utilizing public utilities, parks and highways, and requiring their share of police and fire protection.

Net Fiscal Benefits (Exhibit M)

County government operating revenues from Kapalawai are anticipated to exceed the additional operating expenses as the project approaches stabilized operations, or in about 2003, as shown in Exhibit M.

On the other hand, with its far greater taxing powers and more varied sources of income, the State government's operating revenues are anticipated to by far exceed the additional operating expenses associated with the project throughout its development and operating periods.

The ratios of government operating revenues to government operating expenditures at the anticipated stabilization of Kapalawai in 2004, and for each year thereafter, are estimated to be approximately as follows:

	County	State
Net additional revenues (1998 dollars)	\$60,000	\$760,000
Revenue/expenditure ratio	1.1	2.4

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⁴ Some of Kapalawai's visitors to Kapalawai are considered "new population" for Hawaii, meaning that the other 50% are assumed to be Hawaii's residents who would have been likely to have visited Kapalawai in an ordinary development of the project.

Mr. Scott Ezer
July 22, 1999
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General Limiting Conditions

Thank you for the opportunity to provide this report.

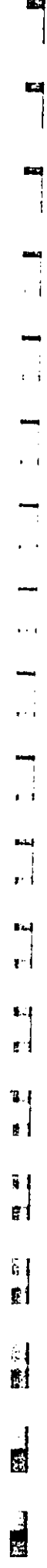
This report is subject to the following standard report conditions:

Respectfully submitted,

Ann M. Bouslog
President

Enclosures

- ◆ Every reasonable effort has been exerted to assure that the data contained in this study reflect the most accurate and timely information possible, and the data shown are believed to be reliable. However, no responsibility is assumed for inaccuracies in reporting by government agencies, consultants, published research, or any other data source used in preparing this study.
- ◆ Since the projections are based on estimates and assumptions which are inherently subject to uncertainty and variation depending upon evolving events, Mikiko Corporation cannot represent them as results which will actually be achieved.
- ◆ Possession of this report does not carry with it the right of publication. Additionally, no abstracting should be made without first obtaining written permission from Mikiko Corporation.



Kapalawai Resort

Project Development and Occupancy Projections
 (2001 to 2004)

Operating year Calendar year	Basis/reference				Stabilized 2004
	-1 2001	1 2002	2 2003	3 2004	
Number of bungalows: Under construction	250	0	0	0	0
Operational	0	250	250	250	250
Utilization assumptions: Occupancy rate	0%	65%	70%	75%	75%
Occupied "bungalow" nights	0	50,300	63,900	68,400	68,400
Annual visitor days	0	115,600	124,600	133,400	133,400
Site utilization (in acres): To be developed: Commercial use	As of 1/1 of each year				
Resort uses	n/a	1	1	1	1
To remain undeveloped:	As of 1/1 of each year				
Other developed areas	n/a	89	89	89	89
Total	170	170	170	170	170

n/a Not applicable

Sources: Compiled based on information provided by Destination Village Kapalawai, LLC and Hollar Haveler & Fee Planners.

Kapalawai Resort

Projected Direct, Indirect, Induced and Total Annual Visitor Expenditures
 (2001 to 2004) (1998 dollars)

DAILY NON-LOGGING SPENDING PER PERSON	Visitor		1997 amount ¹	Time value adjustment ²	1998 amount ¹
	nrk	nrk			
Hawaii residents ³	20%	n/a	n/a	n/a	\$ -
Eastbound visitors to Hawaii	5%	\$199.98	\$199.98	0.93	186.00
Westbound visitors to Hawaii	75%	\$97.30	\$97.30	0.84	91.50
Total	100%				
Weighted average expenditures: Overall			\$83.00		\$78.00
Out-of-State visitors only			\$104.00		\$98.00
Per person per day					

VISITOR EXPENDITURES (in millions) ¹	Basis/reference		2001	1 2002	2 2003	3 2004
	Operating year Calendar year	-1				
Direct:						
Room revenues ⁴		\$185 Initial ADR	\$0.00	\$6.78	\$9.74	\$10.74
Other		\$98.00 per person	0.00	9.07	9.77	10.48
Total, direct			0.00	17.84	19.51	21.20
Indirect and induced ⁵		0.71 multiplier	0.00	12.67	13.85	15.05
Total spending			\$0.00	\$30.51	\$33.36	\$36.25

n/a Not applicable

- Non-logging expenditures by visitor category as shown in Hawaii Visitors & Convention Bureau, "1997 Annual Research Report," June 1999
 - Based on CH-11 data estimates from U.S. Department of Commerce, Bureau of Economic Analysis, as presented by Bank of Hawaii (unpublished data) for westbound travelers, and the ratio of average daily 1997 versus 1998 exchange rates for eastbound travelers.
 - No expenditure allocated to Hawaii residents. It is assumed that the expenditures by Hawaii residents would have been incurred elsewhere in the State even if the Project were not developed.
 - Initial average achieved rate of \$185 based on MABA Corporation, "Market Assessment for Kapalawai Resort," May 27, 1998
 - Hawaii State Department of Business, Economic Development & Tourism (Personal communication, April 8, 1999)
- Calculations consider expenditures allocated to 118 industry categories, modeled in DRED7's Input-Output Model, along with the indirect and induced impacts of each.

Kapalawai Resort

Estimated Direct Employment & Income from Project Development
(2001 to 2004) (1998 dollars, in millions)

INDUSTRY COEFFICIENTS ¹	DBEDT industry category applied		Direct impact coefficient per \$1 million (1992\$) project cost	
	Engineering and architectural services	Single-family residential construction	FTE jobs ²	\$ Income
Professional services	14.81	0.915	0.50	
Construction:				
Bungalows	8.25	0.915	0.48	
Support facilities	11.12	0.915	0.45	
Infrastructure	11.14	0.915	0.48	

PROJECT COSTS & DIRECT JOBS	Cost ³	FTE jobs
Professional services	\$1.80	23
Construction:		
Bungalows	12.00	82
Support facilities	12.30	113
Infrastructure	8.80	64
Subtotal	31.20	259
Total development (jobs rounded)	\$33.10	280

DIRECT PERSONAL INCOME	\$15.87
------------------------	---------

1. Job and income direct impact coefficients calculated from Hawaii State Department of Business, Economic Development & Tourism, "The Hawaii Input-Output Study: 1992 Benchmark Report," December 1998 (Appendix A, pages 60, 63 and 64). Coefficients are based on project cost, in 1992 dollars.
2. Input-Output Study assumes total wage, salaried and proprietary jobs, both full- and part-time (not full-time equivalent); job coefficients are based on construction costs in 1992 dollars.
3. Coefficients are based on construction costs in 1992 dollars.
4. In 1998 dollars, based on data from the Hawaii State Department of Business, Economic Development & Tourism, "Labor Area Market," monthly, Hawaii, Department of Labor Industrial Relations, "Labor Area Market," monthly, Hawaii, Department of Labor Industrial Relations, LLC and Harbor Harbor & Fee Personnel.

Kapalawai Resort

Estimated Direct, Indirect and Induced
Employment and Income from Project Development
(2001 to 2004) (1998 dollars, in millions)

"DIRECT-EFFECT" INDUSTRY MULTIPLIERS ¹	DBEDT industry category applied		Indirect & induced multiplier per direct	
	Engineering and architectural services	Single-family residential construction	FTE jobs ²	\$ Income
Professional services	1.19	0.83		
Construction:				
Bungalows	1.84	0.88		
Support facilities	1.39	0.96		
Infrastructure	1.46	0.97		

JOBS	Total FTE jobs, 2001 ³	
	Direct ⁴	Indirect & induced Total
Professional services	23	27
Construction:		
Bungalows	82	151
Support facilities	113	270
Infrastructure	64	93
Subtotal	259	401
Total jobs (rounded)	280	710

PERSONAL INCOME	\$15.87	\$14.48	\$30.15
-----------------	---------	---------	---------

1. Indirect and induced job and income multipliers derived from Jobs (1) total job and income "Direct Effect" Multiplier as shown in Hawaii State Department of Business, Economic Development & Tourism, "The Hawaii Input-Output Study: 1992 Benchmark Report," December 1998 (Table 5.1).
2. FTE = Full-time equivalent, defined as 40 hours per week or 2,080 per year.
3. As shown in Exhibit C.

Kapalawai Resort

Projected Direct, Indirect, Induced, and Total Operational Employment and Income

(2001 to 2004) (1998 dollars, in millions)

Operating Year Calendar year	Baseline/Reference	-1 2001	1 2002	2 2003	3 2004
Operating summary:					
Operational bungalows	Exhibit A As of 1/1 each year	0	250	250	250
Occupied "bungalows" nights		0	59,200	63,900	68,400
Total FTE jobs¹:					
Direct ²		5	200	200	200
Indirect and induced ³	0.60 multiplier	3	120	120	120
Total		8	320	320	320
Total personal income:					
Direct ³	\$26,357 yr. FTE salary	\$0.13	\$5.27	\$5.27	\$5.27
Indirect and induced ⁴	1.34 multiplier	0.18	7.06	7.06	7.06
Total		\$0.31	\$12.33	\$12.33	\$12.33

1. FTE = Full-time equivalent, defined as 40 hours per week or 2,000 per year. Excludes for wage and salary positions only; does not include proprietary employment opportunities that the direct impacts may also support.
 2. Based on figures provided by Destination Waipaa Kuaui, LLC.
 3. Indirect and induced effects estimated based on Type II "Direct Effect" Multipliers for wage and salary jobs and income, as shown for the Hotels and Lodging phone industry category, in Hawaii State Department of Business, Economic Development & Tourism, "The Hawaii Input-Output Study: 1982 Benchmark Report," December 1998 (Table S.1). Excludes potential proprietary employment opportunities and their associated income.
 4. Average salary based on 1998 average hourly wage of \$12.07 for hotel workers statewide, according to the Hawaii State Department of Labor & Industrial Relations, "Labor Area News," (monthly), multiplied by 2,000 hours per year.

Kapalawai Resort

Projected Average Daily On-site & In-Migrant Populations

(2001 to 2004)

Operating Year Calendar year	Baseline/Reference	-1 2001	1 2002	2 2003	3 2004
Average daily on-site populations:					
Visitors	Exhibit A & 365 days/yr	0	317	341	365
Construction employees ²	Exhibit C	240	0	0	0
Operational employees ³	Exhibit E	0	143	143	143
Total, rounded		240	460	480	510
In-migrants to the State:					
Construction employees ⁴	1% On-site pop.	2	0	0	0
Direct operational employees ⁵	1% Exhibit E	0	2	2	2
Dependents ⁶		0	2	2	2
Total In-migrants to the State		2	4	4	4
In-migrants to Kauai County:					
Construction employees ⁴	30% On-site pop.	72	0	0	0
Direct operational employees ⁵	5% Exhibit E	0	10	10	10
Dependents ⁶		14	10	10	10
Total In-migrants to the County		86	20	20	20

1. All figures represent total persons present throughout any 24-hour period. Due to shift changes and travel off site, actual number on site at any given time is anticipated to be less.
 2. Normal on-site presence anticipated prior to start of construction. Projected on-site population during construction period (2001) based on Exhibit C and a six-day typical work week.
 3. Have anticipated on-site prior to commencement of operations. The value is based on Exhibit E and a five-day typical work week.
 4. Percentage applied to average daily on-site construction worker populations, as shown above. Figure for Kauai County represents about 50% of bungalow and support facility construction employees.
 5. Percentage applied to direct employees from Exhibit E. In-migrants to the County include all those moving to the State plus any that may move between counties due to job opportunities at the project site.
 6. In-migrant dependents estimated to represent 20% of construction workers and 100% of operational employees.

Kapalawai Resort

**Projected Real Property Tax Revenues to the County Government
Attributable to Development & In-migrant Population**

(2001 to 2004) (1998 dollars, in millions)

Operating year Calendar year	Base/reference	-1 2001	1 2002	2 2003	3 2004
COMMERCIAL DESIGNATION					
Improvements:					
Value ¹	Construction estimate	\$0.00	\$1.50	\$1.50	\$1.50
Annual tax	\$3.40 per \$100 AV	0.00	0.01	0.01	0.01
Land:					
Value	1 acre \$11.50 per sq. ft.	0.00	0.50	0.50	0.50
Annual tax	\$4.80 per \$100 AV	0.00	0.00	0.00	0.00
RESORT DESIGNATION					
Improvements:					
Value ²	All areas other than restaurant Construction estimate	\$0.19	\$29.70	29.70	29.70
Annual tax	\$4.40 per \$100 AV	0.00	0.13	0.25	0.25
Land:					
To be developed -					
Value	89 acres \$70,000 per burglar	0.14	17.50	17.50	17.50
Annual tax	\$4.80 per \$100 AV	0.00	0.08	0.15	0.15
To remain undeveloped -					
Value	80 acres \$1,000 per acre	0.02	0.08	0.08	0.08
Annual tax	\$4.80 per \$100 AV	0.00	0.00	0.00	0.00
Total new property tax revenues		0.00	0.21	0.42	0.42
Less: 1998/99 fiscal year property tax payments ³		0.00	0.00	0.00	0.00
Net new property tax revenues		\$0.00	\$0.21	\$0.42	\$0.42

Note: Tax rates shown in "Base/reference" column are FY 1998/1999 rates adopted by Maui County Council on 5/25/99 (Resolution 873-98, Draft 1). These Commercial and Hotel resort rates are applied to the figures shown for calendar years 2002 and 2004. Tax rates and property values estimated for calendar years 2000 and 2001 are based on Agricultural and Conservation rates, representing the current real property tax designation of the property. Projections assume rezoning is obtained in beginning of 2001 and therefore tax rates and valuations based on redevelopment of the property become effective July 1, 2002. Values shown are those estimated as of beginning of each calendar year.

1. Direct hard construction costs as estimated by Distribution Village Kona, LLC. Includes entire building associated with pond-front restaurant.
2. Direct hard construction costs as estimated by Distribution Village Kona, LLC, net of main restaurant building.
3. Total real property taxes payable in Fiscal Year 1998 are \$2,041, according to Robinson Family Partners.

Kapalawai Resort

**Projected Total Annual Revenues to the County Government
Attributable to Development & In-migrant Population**

(2001 to 2004) (1998 dollars, in millions)

Operating year Calendar year	Base/reference	-1 2001	1 2002	2 2003	3 2004
BASES FOR PROJECTION					
Room revenues	Exhibit G (net of land/leases)	\$0.00	\$6.78	\$9.74	\$10.74
In-migrant employees and dependents to County	Exhibit F (persons)	85	20	20	20
ESTIMATED TAXES					
Net new property tax revenues	Exhibit G	\$0.00	\$0.21	\$0.42	\$0.42
Transient accommodations tax ¹	6.5% to Maui County	0.00	0.04	0.05	0.05
Taxes and other revenue sources from In-migrant residents ²	\$125 per person	0.01	0.00	0.00	0.00
Total new County taxes		\$0.01	\$0.25	\$0.47	\$0.48

1. County's share of State transient accommodations tax collections (7.25% of burglar revenues), based on intergovernmental allocations in effect as of June 1999 (new formula applied as of January 1, 1999).

2. Includes local fuel, daily franchise, motor vehicle weight, local license and fees, and other license and permit, as presented by the Tax Foundation of Hawaii, "Government in Hawaii", 1998 (Table 27). Estimated at \$125 per person in 1998 dollars after cost of living adjustment based on unpublished CPI-U index from the U.S. Bureau of Labor Statistics, provided by Bank of Hawaii.

Kapalawai Resort

State of Hawaii Per Capita Government Expenditures

(Fiscal Years 1995/1996 and Estimated 1998)

	Operating expenditures (\$thousands) ¹	Service population ²		Expenditure per:	
		Resident	Non-resident	Resident	Non-resident
General government	\$465,080	1,280,100	384	\$364	\$930
Public safety	166,167	1,290,100	129	\$129	\$1,819
Highways	158,990	1,290,100	123	\$123	\$1,840
Natural resources	44,998	1,290,100	35	\$35	
Health and sanitation	173,887	1,290,100	135	\$135	
Hospitals and institutions	318,030	1,180,888	268	\$268	
Public welfare	1,039,884	1,180,888	881	\$881	
Education	1,453,478	1,180,888	1,231	\$1,231	
Recreation	37,887	1,290,100	29	\$29	
Utilities and other enterprises	314,352	1,290,100	244	\$244	
Debt services	607,529	1,290,100	471	\$471	
Retirement and pension	268,052	1,180,888	227	\$227	
Employees' health insurance	639	1,180,888	\$1	\$1	
Unemployment compensation	233,884	1,180,888	\$198	\$198	
Grants-in-aid to counties	2,826	1,180,888	\$2	\$2	
Urban redevelopment and housing	152,857	1,290,100	\$129	\$129	
Cash capital improvements	347,812	1,290,100	\$270	\$270	
Miscellaneous	205,551	1,180,888	\$174	\$174	
Total, \$ FY 1995/1996	\$8,019,882		\$4,930	\$1,819	
Estimated total, \$ CY 1998³			\$4,970	\$1,840	

Time adjustment: 1.01

1. State government operating expenditures for fiscal year ended June 30, 1996, as provided by the Tax Foundation of Hawaii.
2. Resident or de facto population for the State as of January 1, 1996, based on data obtained from State of Hawaii, Department of Business, Economic Development and Tourism, County of Hawaii, Data Book, 1997.
3. Fiscal year 1998 occurs equivalent to 1998 calendar year (based on CDP) for the second half year of 1995 and first half year of 1996, compared to annual index for calendar year 1998. The number of labor statistics data Note: Preliminary State government expenditure data for FY 1997 actually show a slight decline from FY 1996.

Kapalawai Resort

Projected Annual County and State Government Expenditures

Attributable to Population In-migrating

(2001 to 2004) (1998 dollars, in millions)

Operating year Calendar year	Basis/reference				Stabilized
	2001	2002	2003	2004	
ATTRIBUTABLE POPULATION	-1	1	2	3	
Kauai County:					
Average daily visitors ¹	0	285	307	329	
In-migrant employees & dependents: Related to construction	86	-	-	-	
Related to operations	-	20	20	20	
Total, County	86	305	327	349	
State of Hawaii:					
Average daily visitors ¹	0	254	273	292	
In-migrant employees & dependents: Related to construction	2	-	-	-	
Related to operations	-	4	4	4	
Total, State	2	258	277	296	

ANNUAL EXPENDITURES

Kauai County²:					
Average daily visitors	\$1,170 per person	\$0.00	\$0.33	\$0.38	\$0.38
In-migrant employees & dependents: Related to construction	\$1,170 per person	0.10	-	-	-
Related to operations	\$1,900 per person	-	0.04	0.04	0.04
Total expenditures, County		\$0.10	\$0.37	\$0.40	\$0.42
State of Hawaii³:					
Average daily visitors	\$1,840 per person	\$0.00	\$0.47	\$0.50	\$0.54
In-migrant employees & dependents: Related to construction	\$1,840 per person	0.00	-	-	-
Related to operations	\$4,970 per person	-	0.02	0.02	0.02
Total expenditures, State		\$0.00	\$0.49	\$0.52	\$0.56

1. State estimate excluding all Americans living at the property, since they would be already within the State. County estimate includes 50% of Americans that might have visited Kauai even if the Project were not built.
2. Per capita expenditure estimates as shown in Exhibit J.
3. Per capita expenditure estimates as shown in Exhibit K.

..... MILWAUKEE RECONSTRUCTION
Exhibit A

Kapalawai Resort
County & State Government Revenue and Expenditure Comparison
 (2001 to 2004) (1996 dollars, in millions)

Opening year Calendar year	Basis/reference			Stacked		
	-1 2001	1 2002	2 2003	3 2004	3 2004	3 2004
COUNTY OF KAUAI						
New revenues	\$0.01	\$0.26	\$0.47	\$0.48		
New expenditures	(0.10)	(0.37)	(0.40)	(0.42)		
Net additional revenues	<u>(\$0.09)</u>	<u>(\$0.11)</u>	<u>\$0.07</u>	<u>\$0.06</u>		
Revenue * expenditure ratio ¹	<u>0.1</u>	<u>0.7</u>	<u>1.2</u>	<u>1.1</u>		
STATE OF HAWAII						
New revenues ²	\$0.92	\$1.10	\$1.21	\$1.32		
New expenditures	0.00	(0.48)	(0.52)	(0.56)		
Net additional revenues	<u>\$0.92</u>	<u>\$0.61</u>	<u>\$0.69</u>	<u>\$0.76</u>		
Revenue * expenditure ratio ¹	<u>N/A</u>	<u>2.2</u>	<u>2.3</u>	<u>2.4</u>		

n/a Not applicable.
 1. New revenues divided by new expenditures.
 2. Excludes potential income from any operating entities, proprietor's incomes associated with Project operations, and GET on ground lease rent.



G

TRADITIONAL CUSTOMS
AND PRACTICES REPORT
CULTURAL SURVEYS HAWAII

**HAWAIIAN TRADITIONAL CUSTOMS AND PRACTICES
STUDY FOR KAPALAWAI, AHUPUA'A OF MAKAWELI,
DISTRICT OF KONA, KAUA'I
(TMK 1-7-05:FOR.1)**

by

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Prepared for
Helber Hastert & Fee, Planners, Inc.

Cultural Surveys Hawai'i
July 1999
February 2000
March 2000

ABSTRACT

Helber Hastert & Fee, Planners, Inc. requested a native Hawaiian traditional customs and practices (*Pono 'Ōiwi*) study for the lands known as Kapalawai in the ahupua'a of Makaweli, Kona district, Kaua'i.

Kapalawai consists of approximately 170 acres (TMK 1-7-05:portion 1). The Kapalawai project area is bounded on the west by a corn field known as 'Ākia 1, on the east by 'Ā'akukui Stream, on the north by Kaumuali'i Highway and on the south by the shoreline.

Since Kapalawai has been owned and managed by one family from 1865 to the present (135 years), it was difficult to locate people still living who had any knowledge regarding land use and cultural use specific to the project area or anyone who accessed the area for traditional purposes. Upon acquiring the ahupua'a of Makaweli, the Sinclair-Robinson family lands became, in every sense of the word, private. Because the 'i'i of Kapalawai was reserved strictly for family use, only family members and invited guests were allowed to go there and use the area. Interviews with prior employees indicated that employee residents at Kapalawai had access to resources on the land and in the near off-shore waters at Kapalawai. The interviews indicated that as long as permission was obtained first, the request was granted by the land owner. As for fishing along the Kapalawai shoreline, between 'Ākia 1 and 'Ā'akukui Stream, access was usually obtained via a corridor along 'Ākia 1, just outside the western boundary wall of Kapalawai, or through Pākālā, rather than through the property itself.

Based on the past history of the land tenure, it is unlikely that native Hawaiian traditional customs and practices will be affected by proposed development. Cultural impact, if any, will be minimal.

Note: Throughout this report the spelling of Hawaiian vocabulary and place names has been standardized according to present orthography.

ACKNOWLEDGMENTS

We are very grateful to the Robinson family, especially Warren Robinson and Bruce Robinson, for their time and sharing of their family history; and to Charlie Okamoto for allowing us to use the Kapalawai offices while conducting fieldwork on Kaua'i. We also want to acknowledge the following people for their help on this project: Dr. David Burney and Dr. William Pila Kikuchi for their evaluation of Kekupua Pond; Dr. Lida Pigott Burney, Dolly Kikuchi and Kristina Kikuchi-Palenapa for assisting with field investigations during coring of the pond; Toni DeMello and Susan Remoaldo for their assistance in researching the Portuguese oven; and Nani Kamai, Dr. George Kanna, Kaipoo Akana and Gerald Ida for assisting with contacts while on Kaua'i. A very special *mahaalo* to Carol Lovell, Margaret Lovett, Noelani Pomroy and the staff at Kaua'i Museum; and to the staff of the Kaua'i Historical Society.

Most of all, we are deeply grateful to both *kūpuna* and *kama'āna* who so willingly gave of their time through informal and in-depth interviews and without whose valuable knowledge, this project could not have been completed: Lahapa Dotimas, Joni Ho'okano, 'Olu Ho'okano, Hawila Kaleohano, Aletha Ka'ohi, Kalā Kapahu, Momi Kapahu, Kawika Kapahulehua, Puanani Kapahu Montalvo, Edith Pavao, Ed Rice, Bruce Robinson and Warren Robinson.

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I. INTRODUCTION

The purpose of this Hawaiian Traditional Customs and Practices Impact Assessment is to consider the effects proposed development may have on native Hawaiians as it pertains to their traditions and customs which are protected by law under the Hawai'i State Constitution, Article XII, Section 7, as well as to address any historic properties issues as defined in Chapter 6E of the Hawai'i Revised Statutes. Presently, there are numerous complexities which make it unclear as to the private land owner's obligations under present law. Recent PASH (Public Access Shoreline Hawai'i) issues pertaining to traditional access and gathering rights are still unresolved and are likely to remain so for some time. This assessment is meant to be informational for the purpose of disclosing any impacts proposed development might have on native Hawaiian culture or on any historic properties identified within the defined project area.

The present project area consists of the 'i'i of Kapalawai in the *ahupua'a* of Makaweli, Kona district, island of Kaua'i. Kapalawai consists of approximately 170 acres (TMK 1-7-05-portion 1) (Figures 1-4) and has been in the possession of the Sinclair-Robinson family since 1865. The Kapalawai project area is bounded on the west by a corn field known as 'Akia 1, on the east by A'akukui Stream, on the north by Kaumuali'i Highway and on the south by the shoreline.

This assessment was commissioned by the firms of Helber Hastert and Fee, Planners, Inc. on behalf of their client, Destination Villages Kaua'i, LLC. The assessment was accomplished in conjunction with an archaeological inventory survey of the project area conducted by Cultural Surveys Hawai'i (Zulick *et al.*, 1999 [Draft]).

Scope of Work

This study was requested to fulfill the requirements of an environmental impact statement as well as to identify any historic properties and address any Hawaiian customary and traditional rights and their applicability to the project area. The scope of work included:

- 1) Examination of historical documents, Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits.
- 2) A review of the existing archaeological information pertaining to the sites on the property as they may allow us to reconstruct traditional land use activities of the parcel and identify present uses, if appropriate.

3) Conducting oral interviews with persons knowledgeable about the historic and traditional practices in the project area and region.

4) Preparation of a report on the above mentioned items summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and features identified.

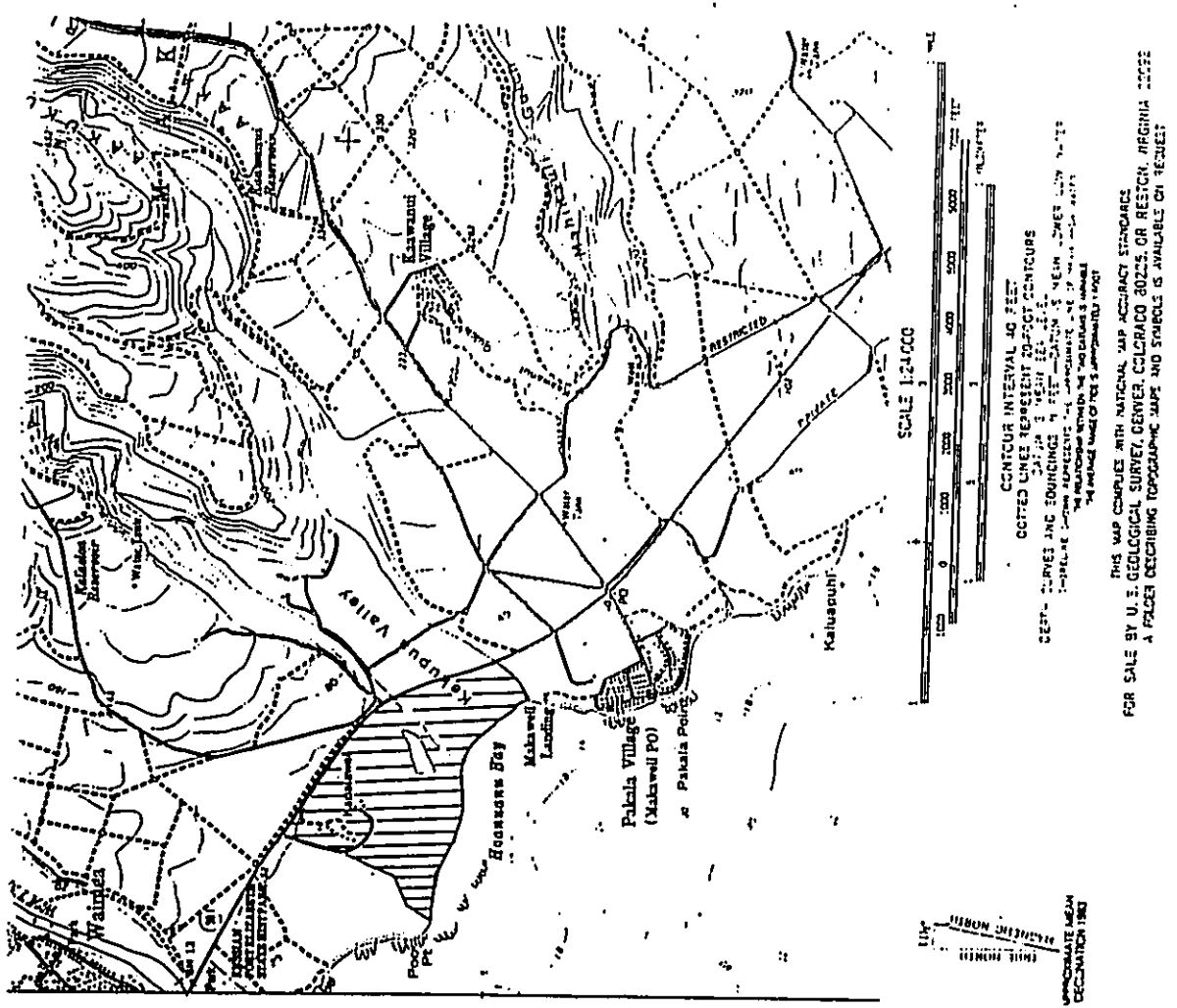


Figure 3 Portion of USGS 7.5 Minute Series, Hanalei Quad, Showing Project Location

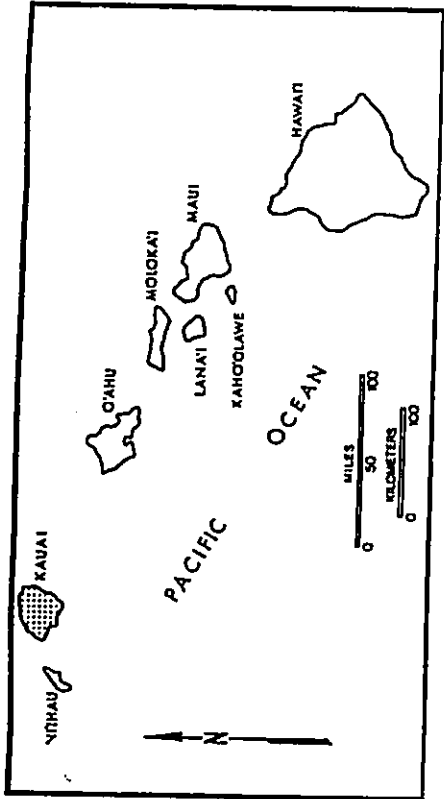


Figure 1 State of Hawaii

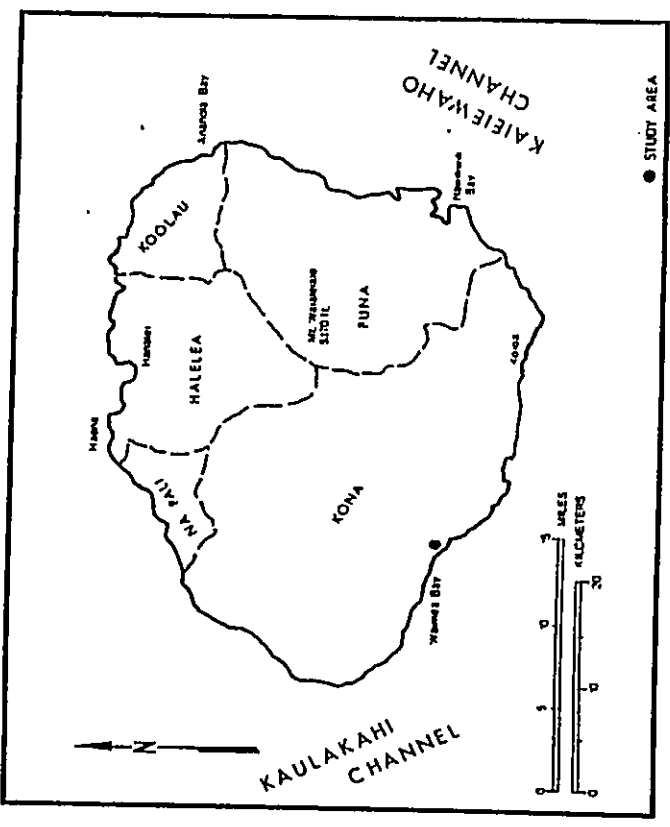


Figure 2 General Location Map, Kauai Island

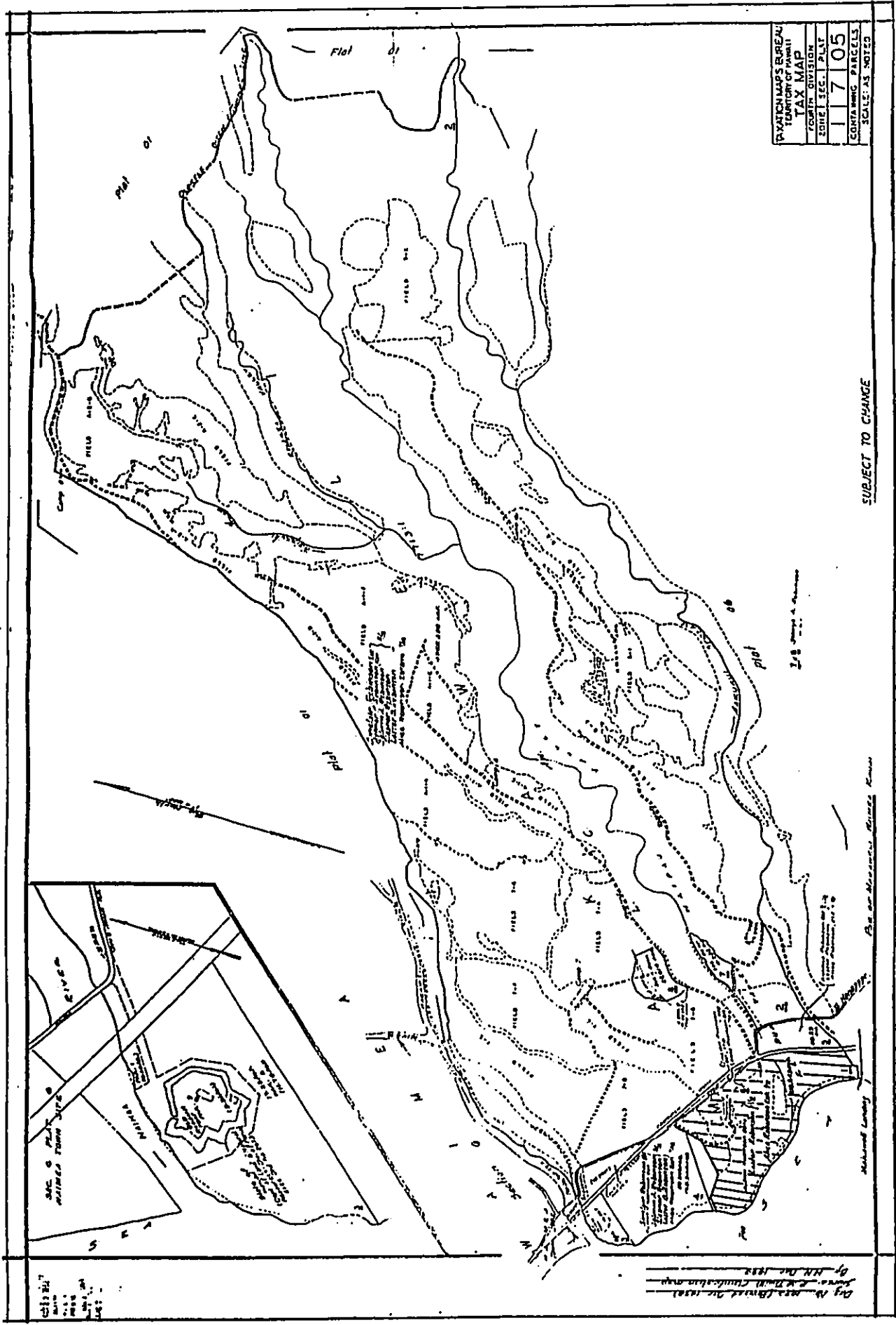


Figure 4 TMK 1-7-05 Showing Project Location

Methods

Historical documents and maps were researched at the Hawai'i State Archives, the Bernice Pauahi Bishop Museum Archives, the Kaula'i Historical Society, the Kaula'i Museum, as well as the library of Cultural Surveys Hawai'i.

In an effort to get a good representation of the community and to contact as many potentially knowledgeable people as possible, the following agencies, organizations and individuals were asked to help identify and recommend any potentially knowledgeable individuals and/or give any information which might be useful to the proposed project area and development: the Office of Hawaiian Affairs on O'ahu and Kaula'i, Kaula'i Community College, Kaula'i Historical Society, Kaula'i Museum, University of Hawai'i at Mānoa - Dept. of Indo-Pacific Languages, *kumu hula*, respected *kūpuna* in the community, Warren Robinson and Bruce Robinson. Inquiries were not limited solely to the above organizations and people and other possible leads were followed up on as well.

Methodology for Oral Interviews

Based on recommendations from the above people and organizations, seven in-depth interviews were conducted with a total of nine people. The informants interviewed were: 'Olu Hō'okano, Hawila Kaleohano, Aletha Ka'ohi, Kalā Kapahu, Momi Kapahu, Kawika Kapahulehua, Ed Rice, Bruce Robinson and Warren Robinson. It should be noted that there were other possible informants contacted who were reluctant to participate in this study.

The ages of the interviewees ranged from about 50 to 81 years, which would place most of them growing up in the early 1920's and 1930's and as late as the 1950's. Many community members pointed out that the *kūpuna* who would be most knowledgeable about the project area of Kapalawai have all passed away. Except for Warren Robinson and Bruce Robinson, six of the interviewees were past employees of the Robinson family and had either worked and/or lived at the project area of Kapalawai at some time during their employment. One of the interviewees is a distant relative through a *hānai* (adoptive) relationship to Charles Gay. Of the nine people interviewed, two were female and six were of Hawaiian ancestry. Formal interviews were conducted with the individuals named above and all of the interviews were taped and transcribed. The interviews usually lasted about one and one-half to two hours. The transcribed interviews, in their entirety, are on file at the offices of Helber, Hastert and Fee, Planners, Inc. on O'ahu and at Bellis, Graham, Proudfoot & Wilson on Lihue, Kaula'i. The interviews may be read by contacting these offices directly. Excerpts of the interviews appear in the *Synopsis of Interviews*, below and throughout this report, as well as, in the archaeological inventory survey (Zulick, et al., 1999 [Draft]).

Although interview questions were not standardized for all informants, an effort was made to consistently retrieve information regarding specific topic areas. These topic areas include:

1. Age of individual and general biographical information
2. Sources of specific knowledge;
3. Specific knowledge of cultural practices and beliefs associated with project area;
4. Duration and frequency of personal familiarity with project area;
5. Kekupua fishpond, i.e., name, associated stories, springs, uses;
6. Place names within the project area and the nearby vicinity;
7. Knowledge of land boundaries within the project area and areas nearby;
8. Knowledge regarding possible settlement and land use within project area;
9. Knowledge regarding cultural sites within the project area;
10. Specific knowledge regarding the rock platform structure; and
11. Referrals to other possible informants who might have specific knowledge of the area.

Even though the majority of the informants were prior employees and had spent time at Kapalawai, most had very little knowledge of Hawaiian legends, names and cultural practices related to the project area. Their knowledge centered around their work experiences and life at Kapalawai, the plantation or the ranch during their lifetime.

A common tie which connected all the informants is that they had all known a particular native Hawaiian man named Kualo who had worked for the Robinsons. All said that Kualo lived to be 104 years old. Based on a conversation with his only surviving child, Kualo died around 1954. This would place his birth in the vicinity of 1850, just two years after the *Māhele*. All the interviewees agreed he would have been a valuable informant were he still alive today. Due to the age and memories of most of the informants, information they heard from Kualo was not retained. One informant, Hawila Kaleohano, spent about 25 years working at Kapalawai with Kualo. He relates that Kualo knew the name of the pond and had shared that information with him, but he didn't think it was important at the time and he cannot recall the name today. However, Mr. Kaleohano was able to recall a story Kualo told him about a *mo'o wahine* (a water spirit who can change forms, in this case, half-lizard and half-human) who lived in the pond and frequented a particular rock in the pond near the water's edge.

Information regarding boundaries and land use was, for the most part, consistent. An important piece of information relating to the fishpond came from Bruce Robinson who knew the names of the springs in the pond and gave valuable insight about the name. This information had been passed down to Bruce Robinson through his father, who had known Kualo.

II. PROJECT AREA DESCRIPTION

Location and Boundaries

The proposed project area is located at Kapalawai (TMK 1-7-05:01), within the *ahupua'a* (land division) of Makaweli in the Kona district on the island of Kaula'i. Makaweli is located between *Waima'a ahupua'a* on the west and *Hanapepe ahupua'a* on the east. The study region of Kapalawai is bounded on the north by Kaunuali'i Highway, on the south by the shoreline, on the west by a parcel of land called 'Aka and on the east by A'akui Stream. The town of Waima'a lies approximately two miles to the west of the project area.

Description of Project Area

The project area, known as Kapalawai, comprises approximately 170 acres. It is located on gentle sloping flats on the coastal lands of Makaweli. The region is typically very dry and dusty and receives an average of 20 inches of rain per year on the coast. (Juvik et al. 1998:56). The soils within the project area are Makaweli-Wainawa-Niu Association. (Foote et al. 1972:4) The vegetation is predominantly scrub vegetation and *hialea* (*Prosopis pallida*) is abundant.

Fronting the whole length of the project area on the coast is a narrow sand beach with the nearshore area being comprised of two zones — "an inner reef flat and an outer reef front that are separated by a shallow reef crest" (Marine Research Consultants 1999:3). The water near the shore is a reddish-brown color due to terrigenous sediment from *mauka* drainage basins and this "appears to be a consistent characteristic of the area regardless of season and weather" (*Ibid.*:12). Also on the property is a six-acre inland pond or *loko pu'uone*, which, during the Sinclair-Robinson tenure, was stocked with mullet (*Mugil cephalus*) and maintained for family use and entertaining guests.

The subject parcel has been retained by the Robinson family for the past 135 years. The site of the Aubrey Robinson home, Kapalawai, was used primarily for raising purebred Arabian horses and grazing cattle. Fruit orchards and vegetable gardens were extensively cultivated for family use and a small dairy maintained. Most of the land was used as pasture land for horses and cattle and has been grubbed over more than once.

III. DESCRIPTION OF THE TRADITIONAL CUSTOMS AND PRACTICES REGION

Southwest Kaula'i

Traditional Hawaiian life and practices on southwest Kaula'i as they had evolved by the late 18th century, are recorded in the accounts of Captain James Cook. To the west of Makaweli is the *ahupua'a* of Waima'a, which is the largest *ahupua'a* on the island of Kaula'i. The period of contact for the Hawaiian islands began when Captain Cook anchored a mile off shore at Waima'a Bay, Kaula'i on January 20, 1778. Cook's squadron consisted of two ships, the *Resolution* and the *Discovery*. Cook went ashore to investigate the availability of water and the temperament of the people to see if they were friendly and if a trade for supplies could be negotiated.

The very instant I leaped ashore, they all fell flat on their faces, and remained in that humble posture till I made signs to them to rise. They then brought a great many small pigs and gave us without regarding whether they got any thing in return or no, indeed the most of them were presented to me with plantain trees, in a ceremonious way as is usual on such like occasions, and I ratified these marks of friendship by presenting them with such things as I had with me." (Beaglehoe 1967:269)

The Hawaiians afforded Cook the same respect as they would one of their high chiefs and, it is believed by many, that they took him to be the personification of one of their gods, Lono (Kuykendall, 1938:16).

The previous day, a "large pond" had been seen beyond the shore and, on the second day, a watering party was sent to replenish the ships supplies. Cook reports:

We no sooner landed, that a trade was set on foot for hogs and potatoes, which the people gave us in exchange for nails and pieces of iron formed into some thing like chisels. We met with no obstruction in watering on the contrary the Natives assisted our people to roll the Casks to and from the pond (Beaglehoe, 1967:269)

Cook took a short walking tour of the immediate area and comments:

I . . . took a walk up the Valley, accompanied [sic] by Dr. Anderson and Mr. Webber; conducted by one of the Natives . . . Our road lay in the plantations, which were chiefly of Tara (taro), and sunk a little below the common level so as to contain the water necessary to nourish the roots. As we ranged down the coast from the East in the Ships, we observed at every Village one or more elevated objects, like Pyramids and we had seen one in this valley that we were desirous [sic] of going to see. Our guide understood us, but as this

was on the other side of the river, he conducted us to one on the same side we were upon; it proved to be in a Morai which in many respects was like those of Otaheite. (Beaglehoe, 1967:269-270)

This *heiau*, on the west side of the river, is thought to be Keinali'i *heiau*. The *heiau* "on the other side of the river" was probably Māhā'ina i *heiau*, whose location was taken from a map by Francis Gay and later became the house site for the first missionary in Waimea, the Rev. Samuel Whitney (Bennett, 1931:104, 111).

Cook goes on to say:

... We returned to the beach by a different route to the one we came. Besides the Tara (taro) plantations before mentioned we met with some plantations of plantain, Sugar cane and the Chinese paper Mulber[ri] tree or cloth plant, as it is more generally called by us, there were also a few low coconut trees but we saw but one bread fruit and but very few of any other sort. (Beaglehoe, 1967:272)

Waimea Village during this time consisted of about sixty houses close to shore and about forty more houses behind the main settlement (Ronck, 1985:29). Cook goes on to say that on this particular excursion, his party acquired nine tons of water, 60-80 pigs, some fowl, potatoes, a small quantity of plantains and taro — all this in exchange for nails and iron pieces (Beaglehoe, 1967:272). Captain Cook's first visit to Waimea was brief, about four days, but it left major impacts on the small village and it would never be the same again. A major impact was the introduction of new diseases for which the Hawaiians had no immunity. The effects proved to be devastating, though little was thought of it at the time.

At contact, Waimea Village was probably the largest coastal settlement on the southwest side of the island. Even though the currents were strong, Waimea Bay had a deep enough harbor where large foreign ships could anchor safely. Waimea was well cultivated with taro fields fed by an amazing engineering feat, Kiki a Ola, the famous Menehune ditch or aqueduct. Farther up Waimea Canyon, remains of terraces still exist. On the hillsides above, were walled-in areas for sweet potato. These remains are evidence that a well-developed agricultural system was in place at one time. Waimea also had an abundant fresh water supply as well. This made the village an ideal place for ships to provision their stores of food and water. After contact, Waimea became the political center for the ruling chiefs of Kaua'i and Kaumuali'i continued to use Waimea as the seat of government up until his death in 1824.

Makaweli *Ahupua'a*

Makaweli, which means "fearful features", refers to a landing, a land division (*ahupua'a*) and a river in what is presently called the Waimea district on the south coast of Kaua'i (Pukui *et al.*, 1974:142). An *'āleo no'ēau* (proverb or wise saying) which sheds possible light on the meaning of Makaweli and which has been passed down over time is

"*Hō'ōlele ka uila o Makaweli.*" Mary Kawena Pukui translates this as, "Sending the lightning of Makaweli flying." She explains that this is a play on the word "*maka-uefi*" or terrifying eyes, which refers to the sending of a god on an errand of destruction (Pukui, 1983:117). At one time, Makaweli might have been known for this particular kind of sorcery or perhaps *akua lele* (flying gods) were commonly seen in this region. Specific information regarding this seems to have been lost over time.

A more ancient name for Makaweli is Ho'ānuanu which means "to cause cold" (Ibid.: 47). This older name is no longer used to refer to Makaweli *ahupua'a* as a whole; however, it is a name still used to refer to Ho'ānuanu Bay along the ocean in front of the project area.

Another interpretation of Makaweli was given by Warren Robinson, who has lived and worked the land most of his life. To him, Makaweli means "red eyes". This is because of the dry, dusty climate and, especially, the fine red dirt Makaweli is famous for, which makes the eyes red (2/9/99 pers. comm.). A similar meaning of "burning eyes" was given by Ed Rice during an interview. Following is an excerpt from the interview in which Ed describes this fine red dirt:

... the red dirt gets as fine as talcum powder. . . you could stomp your foot in it, and it will rise above your head. The dust is so fine it's actually lighter than air. It just floats up. I had always thought that the "burning eyes" came from the fact . . . when the wind blows that stuff does burn. I've had my eyes full of that red dirt.

These last two interpretations are likely to be more recent interpretations of the name, Makaweli. Mr. Rice related he was told this interpretation in the 1960's, which was when he relocated to Hawai'i. As with all place names, meanings may change over time according to usage or to mark events of a particular period in time.

Detailed information about the *ahupua'a* of Makaweli is sketchy, though it can be compared to the adjacent land area of Waimea which is similar in many ways. The lower portions of Kaua'i's southwest plains, which includes Waimea and Makaweli, is dry and gets little rainfall — less than 30 inches annually with an average of 20 inches per year near the coast (Juvik *et al.*, 1998:56). Water for crop irrigation and sustainability of large settlements would have been a problem.

In 1792, the H.M.S. Discovery anchored off the bay of Waimea, Kaua'i. Archibald Menzies, a surgeon and naturalist aboard the ship, writes about a shore visit with Captain Vancouver. The account gives a description of the dry, flat plains of Makaweli being covered with *pili* grass (*Heteropogon contortus*).

... in returning back in the dusk of the evening, we observed a large fire kindled a few miles to the eastward of Waimea (in the Makaweli direction), and spreading over the face of that plain country, which was mostly covered with dry, rank grass that burnt with great rapidity. This alarmed Captain Vancouver, who supposed that it might be a signal for commencing hostilities

on the part of the islanders . . . the fire had been kindled to burn down the old shrivelled [sic] grass and low vegetables, and for no other purpose whatever, which I believe was literally the case, as I recollected well that the same fields were burnt down in the same manner when I was here a few years ago. I mentioned this to Captain Vancouver, and that the natives then gave the same reason for doing it, adding that by this means the next crop of grass grew up clear and free of stumps, and was therefore better adapted for thatching their houses, which was the principal use they make of it. (1920:32)

The account portrays a picture of what the Makaweli plains looked like in 1792. In this account, the Hawaiians are utilizing controlled burning as a method to promote regrowth of a vegetation community dominated by *pili* grass, which was a desired crop. It also is an indication that *pili* grass, commonly used to thatch houses, was an item that would have been gathered during traditional times.

However, on this drier southwestern side of Kaua'i, evidence of well-terraced and cultivated areas deep in the canyons of Waimea, Makaweli, Olokele and Hanapēpē support the idea of a large inland population rather than a coastal one. Mountain trails which led to the sea allowed for trade with coastal dwellers on the more heavily populated northern shores of Waimea, Hanalei and Kalalau. Stories of a particular taro variety, the *ha'o kea*, was said to be fast growing and well adapted to the cold stream water and shallow soil at higher elevations. Another variety, *nā kalo a 'Ola*, was reputed to have grown in high inaccessible places deep in the canyon recesses (Handy & Handy, 1972:397). Freshets from mountain streams provided fresh water fish and shell fish such as *ō opu* (*Eleotridae*, *Gobiidae* & *Blenniidae*), *ōpae* (*Palaemon*) and *hāhāwai* (*Neritina granosa*). On the hillsides above the flood plains the *māiti* varieties of sweet potato were planted. As in other places, edges of cultivated patches. Other plants such as *uhi* (yam), *awa* (Piper methysticum), *wauke* (paper mulberry) and *olonā* (*Touchardia latifolia*) probably grew wild in the wet gulches. There would also have been *kukui* (*Aleurites moluccana*) as well as *ulu* (*Artocarpus altilis*) and *kī* (*Cordyline terminalis*). Native woods would have been utilized for floats, weapons, canoes and paddles. Bird catchers would have access to feathers for leis, royal *kahili*, capes and helmets. All of these items would have provided the necessary food and supplies to sustain such a large inland population (Ibid.: 397-400).

Place Names Analysis

Insight into traditional life-ways and land use practices can often be gleaned from a study of place names in the vicinity. With this in mind, a list of place names was compiled with derivations (where available). Insights from these place names are discussed further below.

Place Names in the Vicinity

Anaka Ridge	Lit. "Roiled" (Pukui et al. 1974:5)
A'a-kukui Valley	Gulch Lit. "candlenut root" (Pukui et al. 1974:5)
A'a-kukui	<i>Heiau</i> for human sacrifice in Kekupua (A'a-kukui) Valley (Pukui et al. 1974:5, 107) Lit. "candlenut root" (Pukui et al. 1974:5)
ʻAhuimanu	"flock of birds" a plain and marshes on the west side of Waimea River named after the thousands of wading birds that lived there. Some of this land was given to the missionaries Whitney and Roggles (Wichman 1998:11)
Hipō	"purge night" site of the Russian Fort Elizabeth built by Georg Schaeffer (Wichman 1998:7)
Hoaka Point	"Lit. "Crescent" (Pukui et al. 1974:47)
Hoānuanu Bay	"Old name for Makaweli, Kaua'i. Lit., to cause cold" (Pukui et al. 1974:47)
Holoa-wiki	"Quick decision" Houselot of the Welshman John Williams, one of the first <i>haole</i> residents on Kaua'i, located near Pu'uwahie (Wichman 1998:11-12)
Hukipo Ridge	USGS quad map
Kahana	A place just Hanapēpē side of Waimea - Kapa'ahoa is given as the name of the wind. (Nakuina & Mookini, 1990: 53)
Kahōluamanu	The highest cliff of Waimea Valley Kaua'i, Lit. "the slide [of] birds" (Pukui et al. 1974:65) or sled of Manu
Kaleinamanu Ridge	USGS quad map
Kaluaupuhi	"Lit. "the eel pit" (Pukui et al. 1974:79)
Ka-mo'o-kahi	("First land division") one of four areas watered by Kiki-a-Ola Ditch (Wichman 1998:7)
Kamo'o-ejua	("Second land division") one of four areas watered by Kiki-a-Ola Ditch (Wichman 1998:7)
Kamo'o-ekolu	("Third land division") one of four areas watered by Kiki-a-Ola Ditch (Wichman 1998:7)

Kamo'o-eha	("Fourth land division") one of four areas watered by Kiki-a-Ola Ditch (Wichman 1998:7)	Koai'e	Major valley branching off of the Waimea River named after the species of tree that was uprooted by the Hawai'i Island hero Nāmakaokapa'o for a war club (Wichman 1998:12)
Kānehapu'u	"male tree fern" seemingly the name of a stream near Kaunuloa (Wichman 1998:24)	Koki Point	USGS quad map
Kānekula Ridge	Nose of ridge between the Waimea and Makaweli Rivers (USGS Map)	Kū-ana-lili	<i>Heiau</i> for human sacrifice in Kekupua Valley (Pukui <i>et al.</i> 1974:107)
Kapalawai	the water moss	Kumuhau	("source of hau"), name of field beside the Waimea river (Wichman 1998:7)
Kapakohana	"naked one", brother of 'Ou-lehelehe, name of the land area ashore of Kaunuloa on the east stream bank of Kānehapu'u (Wichman 1998:24)	Kumu-kukui	("source of candle-nut") name of field beside the Waimea river (Wichman 1998:7)
Kapua'i-o-	"Kapakohana's footprints" a site seemingly resembling footprints in stone	Kumu-niu	("source of coconuts"), name of field beside the Waimea river (Wichman 1998:7)
Kapakohana	near Kaunuloa (Wichman 1998:25)	Kumu-ohia	("source of mountain apple") name of field beside the Waimea river (Wichman 1998:7)
Kaua	Lil. "the rain" surf spot off the coast of Makaweli (Wichman 1998:25)	Kumu-olu	("Source of breadfruit"), name of field beside the Waimea river (Wichman 1998:7)
Kaumakani Point	Lil. "Place [in] wind" (Pukui <i>et al.</i> 1974:94). An area of unusual winds and waterpouts (Wichman 1998:28)	Kunini Gulch	Gulch off of the Waimea River (USGS Map)
Ka-unu-loa	("the long pebble") <i>Heiau</i> for human sacrifice in Kekupua Valley (Pukui <i>et al.</i> 1974:107) Alternately identified as the landing place for canoes and traced to the etymology "long endpiece of a canoe" (Wichman 1998:24)	Lā'au-ōkula	"thorny tree" area on east side of the mouth of Waimea River (Wichman 1998:9)
Kawa'ula'iliihi	The water on the left is the color of iced tea... the red side was called "water that turns the skin red as fire" (Wichman 1998:7)	Luhi	"tired" a beach of white sand directly below the Russian Fort. (Wichman 1998:26)
Ke-ahi-lele	The landing on the west side of the mouth of Waimea River. "Flying fire," perhaps after a shooting star or a comet (Wichman 1998:9)	Māha'ihai'i	"brittle" A small plain upriver of Lā'au-ōkula edged on one side by twenty foot-high cliffs where there was a large sport field. Site of first home of missionaries Whitney and Ruggles in 1820 (Wichman 1998:9)
Kekupua Valley	"Valley near Makaweli... Three <i>heiau</i> for human sacrifice were here: Kū-ana-lili, A'a-kukui, and Ka-unu-loa (the long pebble)" Pukui <i>et al.</i> 1974:107)	Mahinauli Gulch	"Lit. "dark moon" (Pukui <i>et al.</i> 1974:47)
Ke-olo-ewa	Name of a ridge west of Waimea River, named after god of sorcerers and black magic (Wichman 1998:12)	Makaweli	Major valley branching off of the Waimea River which became a separate <i>chupua</i> a Lit. "Fearful features" (Pukui <i>et al.</i> 1974:142) Perhaps named in reference to the glaring, threatening eyes of religious images or the fearful eyes of the victims (Wichman 1998:22)
Kiki-a-Ola Ditch	("Container acquired by Ola", popularly known as the "Menchune ditch")	Maku Gulch	USGS Quad map
		Manienie'ula Ridge	"Lit. "red Bermuda grass" (Pukui <i>et al.</i> 1974:47)

Menehune ditch Popular name for Kiki-a-Ola Ditch (Pukui *et al.* 1974:150)

Mokihana Ridge *Lit. Pelea arisafa...its flowers strung in leis represent Kaula'i (Pukui *et al.* 1974:154); place across the river where stone for Kiki-a-Ola Ditch was quarried (Wichman 1998:8)*

Mokihana Valley Major valley branching off of the Waimea River named after the fragrant endemic berry (Wichman 1998:8)

'Ou-lehelehe "protruding lips" name of a rock that was once a woman offshore of Kaunuloa (Wichman 1998:24)

Nihoia Gulch Gulch off of the Waimea River (USGS Map)

Nonopahu Ridge USGS quad map

Pākalā Point "*Lit.* "the sun shines", possibly location of a *heiau* of the same name (Pukui *et al.* 1974:175)

Papa'ena'ena Chief's name associated with a huge hollowed out stone formerly on the beach (Wichman 1998:8)

Papua'a Ridge USGS quad map

Peamoa Valley USGS quad map

Pē'ape'a A place just Waimea side of Hanapepē, Mākaupili is given as the name of the wind. (Nakuina & Mookini, 1990: 53)

Pē'e-Kaula'i farm land watered by Kiki-a-Ola Ditch (named after the ancient homeland of the Menehune) (Wichman 1998:9)

Pē'eKaula'i Ditch USGS quad map

Pū'u Moi a small hill near Waimea Canyon where dried Moi fish were brought to feed Menehune for the Kiki-a-Ola Ditch

Pū'uoPapai USGS quad map

Pū'uopai a mountain on Kaula'i named for the shrimp gathered to feed Menehune for the construction of Kiki-a-Ola Ditch

Pū'u-wahie "firewood hill" named after a mound of cut sandalwood piled up on the 'Āhuimanu plain on the west bank of the Waimea River. (Wichman 1998:11)

Wai'ala'e "Mudhen stream" The name encompasses the stream valley branching off Waimea River, the waterfall and the mountainous area at its back. (Wichman 1998:12)

Wai-kea "white water." For a while the two streams do not mingle...on the right the water is clear (Wichman 1998:7)

Waimea or "red water" was named "because of the color of the dirt carried by the river in flood." (Wichman 1998:7) Waipao is given as the name of the wind. (Nakuina & Mookini, 1990: 53)

Waipao Valley "*Lit.* "scooped water", (Pukui *et al.* 1974:227)

The place names in the vicinity of the Kapalawai project area refer to many of the most important cultigens introduced by Polynesians which most likely formed dietary staples or were frequently used as raw materials by the people of the area. These include the well-known breadfruit ("Kumu-'ulu"), coconuts ("Kumu-niu"), mountain-apples ("Kumu-'ōhia"), candle-nuts ("A-a-kukui") and "Kumu-kukui" and *hau* ("Kumuhau"). Certain native plants are referred to including *hupu'u* tree fern ("Kānehapu'u"), *koai'e* a form of *koa* ("Kōai'e Valley"), *maniti'e ulu*- a golden beardgrass ("Maniti'e'ula Ridge") *mokihana* whose fragrant fruits are symbolic of Kaula'i ("Mokihana Valley" and "Mokihana Ridge") and the *'itiaki* or sandalwood is indirectly referred to in the place name "Pū'u wahie".

Of these plants, only coconut trees and *hau* are reported to be present within the project area itself. The coconut trees could have been a subject of native gathering rights if they were planted by Hawaiian families who accessed them for traditional and cultural purposes. However, there was no evidence to suggest that this occurred and it is more likely that these coconut trees were planted by the Robinson family. The relatively quick-growing and common *hau* was probably the subject of native gathering but, there is no evidence that the *hau* within the project area itself was gathered.

The place names in the vicinity of Kapalawai are relatively rich in references to birds including "Āhuimanu", "Kahōluamanu", and "Wai'ala'e" with only the last place name specific to a type of bird (the mudhen or Hawaiian gallinule; *Gallinula chloropus sandwicensis*). It seems probable that a variety of birds including the 'ala'e were harvested by Hawaiians in the vicinity. It seems probable that freshwater birds associated with fishponds were regarded as "privately-owned" resources as much as the fish in the pond were. At any rate the endemic and endangered 'ala'e is protected by state and federal laws.

Two animal species (both proverbial as Menehune payment) are listed: 'opai [sic. 'opee] (various native freshwater shrimps) and moi (thread fish; *Polydactylus sexfilis*). Both of these may have been husbanded in fishponds but it would seem certain that the interest in fishpond kept species would have been highly proprietary. Native gathering would have only applied to streams and marine shallows.

Thus while place name analysis offers insights into the traditional life-ways and land use practices of the vicinity of the project area, no gathering practices specific to the project area appear to be indicated.

Botanical Analysis

The botanical survey of the Kapalawai parcel by Winona P. Char (Char & Associates, April 1999) identified a total of 145 plant species of which thirteen are native and two are Polynesian introductions. Such botanical studies may offer insight into possible patterns of native gathering practices. These fifteen native plants along with known uses are presented below:

Hawaiian Name: 'a'āi'i
Other Names: 'a'āi'i, *kū makani*, 'a'āi'i, *kūma kua*, *kūmakani*
Scientific Name: *Dodonaea viscosa*
Ethnobotanical Uses: The fruit and leaves are popular in lei making. (Wagner, Herbst & Sohmer:1228)
Biogeographical status: indigenous
Proverb: *He 'a'āi'i kū makani mai au; 'a'ōhe makani nana e kula'i. I am a wind-resisting 'a'āi'i; no gale can push me over (Pukui:507).*

Hawaiian Name: 'aki'aki
Other Names: 'aki, 'aki mahiki, *māhīhīhī*, *mānienie*, *mānienie'aki'aki*, *mānienie*
māhīhīhī, *mānienie maoli*, Seashore rushgrass, beach dropseed.
Scientific Name: *Sporobolus virginicus*
Ethnobotanical Uses: The Hawaiian name alludes to the power of this grass to exorcise spirits. In fact, it was used in ancient exorcism ceremonies. (Johnstone:27 and Neal 66-67)
Biogeographical status: indigenous

Hawaiian Name: hau
Scientific Name: *Hibiscus tiliaceus*
Ethnobotanical Uses: The bast fibers of this species were formerly used for cordage and the light wood for the spars of the outriggers of canoes, and occasionally for the outrigger float...It also was used for floats for fishnets. Fires were started by friction from rubbing a pointed stick of a harder wood such as *Perrotetia* against a grooved piece of the much softer hau. The flowers and bark were also used medicinally. (Wagner, Herbst & Sohmer: 888).
Biogeographical status: indigenous?
Proverb: *Ka makani ha 'iha'i lau hau o Olowalu. The hauy-leaf tearing wind of Olowalu. (A gusty wind). Pukui:1457*

Hawaiian Name: 'ilima
Other Names: 'ilima kōi kukui, 'ilima kū kaha kai, 'ilima kū kula, 'ilima papa
Scientific Name: *Sida fallax*
Ethnobotanical Uses: Flowers used for leis. (Wagner, Herbst & Sohmer: 1056) A mild laxative for babies is made by squeezing out the juice of flowers, this is called *kanakamaika'i* (Pukui & Elbert:98)

Biogeographical status : indigenous
Proverb: *Ola na 'ilima wai 'ole i ke ao 'ipua, Healed are the 'ilima of the waterless places by the rain cloud (Pukui 2487).*

Hawaiian Name: *iti'e*
Other Names: *hiti'e*, *'itihe'e*, *lauhili (Ni'ihau)*
Scientific Name: *Plumbago zeylanica*
Ethnobotanical Uses: This plant was used as "baby medicine" according to specimen label data (1933, Neal s.n. BISH) and apparently the sap was used to blacken tattoos in Hawai'i. (Wagner, Herbst & Sohmer: 1056)
Biogeographical status : indigenous

Hawaiian Names: *kōai'awa*,
Other Names: *kōai'awa'āia*, *kōai'lāau*, *(Ni'ihau)*, *kōai'pehu*.
Scientific Name: *Iponomea indica*
Ethnobotanical Uses: Hawaiians used roots and leaves of this plant in plasters and poultices for wounds, sores, and in the treating broken bones; the seeds and other plant parts were used as a cathartic (Wagner, Herbst & Sohmer:656-7). Kainuhou has used *kōai* to help people suffering from broken bones and damaged or injured ligaments, tendons, and cartilage. (Kainuhou:6)
Biogeographical status: indigenous
Proverb: *He kōwai, he pōka'āwīi. He is like a morning-glory vine, twisting this way and that. (Pukui, 703)*

Hawaiian Name: *kupala*
Other Names: 'āunuu
Scientific Name: *Sicyos pachycarpus*
Ethnobotanical Uses: No known Hawaiian uses
Biogeographical status: endemic

Hawaiian Name: *mai'a*
Other Names: Groups: *maoli*, *pāpō'ulu*, *iholena*, *mai'a hāpai*
Scientific Name: *Musa x paradisica*
Ethnobotanical Uses: An important part of the Hawaiian diet, although most varieties were forbidden to women. Besides its value as a food, the plant had many other uses. In religious ceremonies the fruit was used as an offering, the leaves, usually of the *ieie* variety, to cover an altar, and the stalk was used to symbolize a man. The stalks also were used to line the *imu* (underground oven), as canoe rollers, or were mashed and used as a poultice for sprains or broken bones. The fibers and epidermis of the leaf bases of several varieties were used in lei making. Banana leaves were placed over the imu to keep dirt out of the food being cooked. The sap was used as a dye and it and the fruit of some varieties were used medicinally. The thick nectar of the flowers was fed to babies. (Wagner, Herbst & Sohmer: 1465)

Biogeographic status: Polynesian introduced

Hawaiian Name: *ma'o*
Other Names: hoory abutilon
Scientific Name: *Abutilon indicum*
Ethnobotanical Uses: No known Hawaiian uses
Biogeographical status: indigenous
Hawaiian Name: *milo*
Other Names: Portia tree
Scientific Name: *Thespesia populnea*
Ethnobotanical Uses: Wood and fibers used by Polynesians (Wagner, Herbst & Sohmer: 902).
Biogeographical status: indigenous?
Proverb: *He milo ka la'au, mimito ke aloha. Milo is the plant; love goes round and round, Said of the milo tree when its leaves blossom, or seeds were used by a kahuna who practices hana aloha sorcery (Pukui 818).*
Hawaiian Name: *naupaka kahakai*
Other Hawaiian Names: *au-paka (Ni'ihau), huahekii, naupaka kai.*
Scientific Name: *Scavola sericea*
Ethnobotanical Uses: Berries sometimes eaten during times of famine (Krauss:16).
Biogeographical status: indigenous

Hawaiian Name: *niu*
Other Names: *ololani, niu hiwa, niu lelo*
Scientific Name: *Cocos nucifera*
Ethnobotanical Uses: In Hawai'i 2 forms were introduced by the Polynesians: *Niu hiwa*, with dark green fruit and black endocarp, used ceremonially, medicinally, and for cooking; and *niu lelo*, with reddish fruit and yellow endocarp, used more generally for secular purposes, but not ceremonially or for medicine. The trunks were used as house posts or were hollowed out to make small canoes, drums, or food containers. The leaves were used to make baskets for carrying or storage, for thatch, or to pound the ocean to scare fish into nets. The heavy base was used to tamp or pound the banks of taro paddies into shape. The leaflets were plaited into fans or balls, while the midribs were used as brooms, for a kind of Jew's harp, to string *kukui* nuts for light, to construct small traps for shrimp, and for a strainer for *kava* and other liquids; fibers also were made into a very strong rope used to make nets to hold calabashes or for lashings. It could be used to lash outriggers to canoes as saltwater did not cause the rope to deteriorate or weaken. The shell of the fruit was used for utensils for eating, drinking, or scooping; it was also used to hold and store dyes, fish lines, and other small items; and a small knee drum was made from a coconut shell with its ends removed and covered with fish skin. The water in the fruit was used as a drink; the nuts could be carried on journeys as a water source. The flesh was eaten at all stages of maturity; at the spoon stage it was eaten raw, either alone or with other foods such as poi,

while the mature flesh was usually grated and the milk extracted to be used in cooking or to make sweets. Oil extracted from the mature meat was used on the body and hair, or was spat on a rough sea to calm it, enabling fisherman to see below the water surface. The haustoria that filled the interior of a sprouting nut was eaten. (Wagner, Herbst & Sohmer:1362)

Biogeographical status: Polynesian introduced.

Hawaiian Name: *pāhūhūe*
Other Names: Beach Morning Glory, *pūhūhūe*
Scientific Name: *Ipomoea pes-caprae*
Ethnobotanical Uses: Roots and leaves of this species are said to have been used as famine food, but cathartic compounds make its use dangerous. Its medicinal uses were similar to those of *Ipomoea indica*. (Wagner, Herbst & Sohmer:559).
Biogeographical status: indigenous

Hawaiian Name: *pāpōlo*
Other Names: *olohua, polopolo, pōpōlohua (Ni'ihau)*
Scientific Name: *Solanum americanum*
Ethnobotanical Uses: This plant was used medicinally by Hawaiians for the digestive tract and sore throats. (Wagner, Herbst & Sohmer: 1269)
Biogeographical status: indigenous?

Hawaiian Name: *uhaloa*
Other Names: *ala'ala pūloa, hala 'uhaloa, hi'aloa, kanakaloa*
Scientific Name: *Walthera indica*

Ethnobotanical Uses: This plant was used medicinally by the Hawaiians; the bitter inner bark or roots apparently worked as a pain killer especially for sore throat (Neal, 1965; Pukui & Eibert 1986) (Wagner, Herbst & Sohmer: 1280).
Biogeographical status: indigenous?

Thus, twelve of these native plants were utilized in some specific manner by Hawaiians and could have been sought for by native gatherers. All of these species which were utilized are, however, quite common. As Ms. Char concludes: "All of the plants can be found in similar environmental habits throughout the Hawaiian Islands. Our extensive oral history interviews did not disclose any practice of harvesting these or any other plant species within the project area.

Numerous species of plants introduced after Western contact were the subject of native gathering at some places at some times. Such introduced plants identified within the project area include *kiaue (Prosopis pallida)*, *koli* or castor bean (*Rhus communis*) and *kuawa* or guava (*Psidium guajava*). These exotic plants tend to be very widespread in distribution and there is no reason to believe that such species were ever gathered by Hawaiians within the Kapalawai project area.

Avifaunal and Feral Mammal Resources

The study by Phillip L. Bruner of the avifauna and feral mammals for the Kapalawai project identified a number of native bird species including:

Pacific Golden-Plover	Kāleo	<i>Pluvialis fulva</i>
Ruddy Turnstone	'Akekeke	<i>Arenaria interpres</i>
Wandering Tattler	'Ulihi	<i>Heteroscelus incanus</i>
Common Moorhen	'Alae	<i>Gallinula chloropus</i>
Hawaiian Duck	Kōloa	<i>Anas wyvilliana</i>
Black crowned Night Herons	'Auku'u	<i>Nycticorax nycticorax</i>

David Malo (1951: 39) relates that the 'Alae, Kōloa, and Kāleo were "ke manu ono" or "delicious eating birds" by which we may reasonably infer that they were popularly hunted. These birds are all protected by federal and state law.

The Bruner study also documents the presence of dog and pig tracks within the project area. The map of pig distribution for Kāua'i (van Ripper and van Ripper III, 24) however shows wild pig populations over the majority of the island with concentrated densities shown at higher elevations. Thus there is no reason to believe that the project area was ever particularly good for pig hunting.

IV. ORIGINAL SOURCE OF TITLE AND HISTORY OF LAND USE

Land Ownership of Waimea and Makaweli: 1778 - 1848

In 1778, when Captain Cook first landed at Waimea, Ka'eoikilani was the ruling chief of Kāua'i (Kamakau, 1992:92). Upon his death in 1794, he was succeeded by his son Kaumuāli'i. Because Kaumuāli'i was too young to rule at the time, the kingdom was administered by his *kahu* (guardian), Nākaikua'ana (Kamakau, 1992:162, 169). In 1810, rather than go to war, Kaumuāli'i offered to cede his government to Kamehameha I. Kaumuāli'i and Kamehameha must have reached a mutual understanding because Kaumuāli'i was allowed to rule independently over his kingdom of Kāua'i until his death in 1824 on O'ahu, where he had resided following his marriage to Ka'ahumanu two years earlier (Ibid:253). Following Kaumuāli'i's death, there was a great rebellion and a vying for political power between the Hawai'i and Maui island chiefs and the Kāua'i chiefs. It was at this time that the Kamehameha family won control of Kāua'i. The Kāua'i chiefs were punished for their rebellion and were excluded from the *kā'ai āna* (distribution of lands) when the lands were redistributed.

At the end of the 1824 rebellion, as Hawaiian historian, Samuel Kamakau, notes:

The lands held by chiefs of Hawai'i were tabu; Waimea and Makaweli were held by Ka-'iimanoa and Ka'u'uku-ali'i . . . (1992:268)

Soon afterward Kaikiō'ewa was appointed governor of Kāua'i (Ibid: 269). He held this position until his death in 1839.

Following the death of Kamehameha I, Ka'ahumanu, his favorite wife, inherited his lands. When Ka'ahumanu died in 1832, her heir was Elizabeth Kaho'ano'oku Kīna'u, daughter of Kamehameha I and Kaheheimālie (Ka'ahumanu's sister). Kīna'u inherited Ka'ahumanu's *āna* (lands) as well as the position of *Kūhina Nui* (Premier). In 1827, Kīna'u married Mataio Kekūāno'a and bore five children. The first two sons died young. But the other three children would continue the Kamehameha legacy. Alexander Lihōlilo would reign as Kamehameha IV and Lota Kapuāiwa would reign as Kamehameha V. Kīna'u died in 1839 only four months after her daughter, Victoria Kamāmalu Ka'ahumanu, was born. Since Kīna'u's death was sudden and she did not leave a *kauoha* (command), it was decided by the *Ali'i Nui* (high chief) that Victoria Kamāmalu would inherit her lands and her position of *Kūhina Nui*. Kamāmalu's guardians were John 'I'i and her father, Mataio Kekūāno'a (Kame'eiehiwa, 1992:120-24).

At the time of the Māhele in 1848, Kamāmalu held seven *āna* on the island of Kāua'i. Five of these *āna* were relinquished to the *Mō'i* (King) and she retained two *āna* for herself. The *ahupua'a* of Makaweli was kept for Kamāmalu (LCA 7713). Because she was only 7 years old at the time of the Māhele, her guardians, Mataio Kekūāno'a and Ioane 'I'i, acted on her behalf. In 1857, Kekūāno'a and 'I'i, acting as guardians of Victoria

Kamāmalu, agreed to a *Palapala Ho'ōlimālima Kula* (lease for *kula* lands) to a *hui* (group) of people from Makaweli and Waimea. The group consisted of 120 people who all signed the lease. The lease reads:

*Eia nā mea i koe ma kāa ho'ōlimālima 'ana o ka loko nui i Kekupua a me nā loko
i'i i'i, 'o ka i'a ho'ōmalu, 'o ka lā au kapu o nā kumu 'alani i Waieka, 'o nā lo'i
Pō'ālima a me nā kumu nui o Māha'īha i a me Kekupua, 'o nā kuleana, 'o nā kāmaka a
me ka Pō'ū kapu, ka wahie inā he mea kū ai koe no ia ma kāa ho'ōlimālima 'ana.*

Translation: Here are the things exempt from this lease. The large pond in Kekupua and the small ponds, the protected [by taboo/kapu] fish, the sanctioned wood of the orange trees at Waieka, the Pō'ālima taro fields and the large trees of Māha'īha i and Kekupua, the *kuleana* [lands] of the people and the reserved fort; the firewood, if it is for sale, is exempted by this lease.

The "large pond in Kekupua" is the prehistoric fishpond recorded in the current project area which is known as Kekupua Pond, today.

The above exemptions are obviously a carry over of the ancient *kapu* system. The lease indicates the kinds of items that were *kapu*. Traditionally, large ponds were often reserved for the *ali'i*. The lease also indicates that even though the *kapu* system was done away with in 1819, certain *kapu* were still being observed by the *ali'i* and their people as late as 1857, only 8 years prior to Eliza Sinclair acquiring Makaweli *ahupua'a* in 1865. It is likely that these *kapu* were still being observed up until the time Mrs. Sinclair purchased Kapalawai, along with the rest of Makaweli *Ahupua'a*. As owner of the whole *ahupua'a*, Mrs. Sinclair replaced the *konohiki* and controlled the lands in much the same way a *konohiki* would have done. As an established relationship between the *konohiki* and the native tenants was already in place, it would have been very easy for her to maintain these same relationships and carry them over to her tenure. It is evident from the interviews that Mrs. Sinclair retained the *kapu* which were in place when she arrived. For example, fishing for mullet in Kekupua Pond was not allowed, but other kinds of fish were allowed to be caught. These same relationships were carried over to the Robinson tenure after Mrs. Sinclair's death and continued up into the time of Eleanor Robinson, when maintenance of the pond ceased and mullet were no longer actively raised.

At the time of the Māhele in 1848, Waimea Town was the largest settlement on the island. There were 196 land claims registered for Waimea while to the east of Makaweli, in the *ahupua'a* of Hanapēpē, 93 land claims were registered. In Makaweli, there were 117 land claims. So as the distance increases from Waimea toward Kōloa the population and number of claims diminish. However, there is a sizable population in Makaweli of soldiers at the fort in Waimea.

There were no claims filed for Kapalawai in Makaweli. (There were nine claims filed for Kapalawai in Waimea and four claims filed for Kapalawai in Hanapēpē.) However, there were two claims, #2290 and #2291, which mention Kekupua and give reference to the fish pond.

LCA #2291

Emelie Keaweamahi and Kapuni ai claim eight *'āna* in Land Claim #2291. Emelie gives testimony that she received these lands from her husband Kaikiō'ewa who served as governor of Kāua'i up until his death in 1839. In 1840, Keaweamahi married [Elin] Kapuni'ai and named him as her heir.

In the claim for parcel No. 4 of LCA #2291, mention is made of:

... a *kula* called Kulaamokoaluli in the *ahupua'a* of Makaweli, Kāua'i . . .

The *kula* boundaries are described as:

Mauka by John Bailon's *kula* of Kekupua
Hanapēpē by a *kula* separating it from the *loko* called Kekupua and Kinaii
Makai by public road
Mana by a *kula* in Makaweli.

The claim for parcel No. 5 also mentions:

... a *loko i'a* in the *'ili* Kekupua in Makaweli of Kāua'i

The boundaries are given as:

The *kula* of Kekupua
Hanapepe by an *āia pa'akai*
Makai by Kaukahi [Kauhale?] Pu'uone
Mana by two *lokos* whose names I do not know.

In the Foreign Testimony (Vol 11:183-87) given on March 26, 1851, Iona [Kamo'opohaku] corroborates Emelie and Kapuni'ai's claim by saying that Parcels nos. 4 and 5 were

... the property of Kaikiō'ewa till his death, when they fell to his widow and heir, Emelie Keaweamahi, who named Claimant [Kapuni'ai] about the year 1840 and in this way they came into Claimant's possession. No. 4 was given to Claimant's brother Hukiku by Kaikiō'ewa who held it till his death, when he left it to Claimant as heir and he holds it without dispute at the present time. No. . . . 5 . . . are also held by Claimant without dispute from the time he came in possession of them till the present time.

Similar testimony by Iona [Kamo'opohaku] regarding locations and boundaries for Parcels No. 4 and 5 is documented in the Native Register (Vol. 11:53-56).

No. 4 - Garden Nainanokaelele in Makaweli ahupua'a . . .

Section 4:

Mauka - J. Bull's pasture
Hanapēpē separating Kekupua pond, pasture
Makai - Government Road
Mana - In Makaweli, a pasture . . .

No. 5 - Fish pond Kahe in the 'ili Kekupua in Makaweli . . .

Section 5:

Mauka - Kekupua pasture
Hanapēpē - salt lake
Makai - Mahinauli beach
Mana - Kaunuloa pasture

The testimony goes on to say that Sections 4 and 5 "have been leased for personal gain; no objections to the present time" (Ibid.).

Settlement Pattern for Makaweli Ahupua'a Based on the Māhele Claims

The pattern of settlement for Makaweli Ahupua'a is far from clear. Māhele land claims of the mid 1800's often offer a good approximation of traditional patterns of land use but this is not the case at Makaweli owing to the nature of Māhele records for this area and changes in land tenure patterns which occurred in the early 1800's.

The enumeration of Māhele land claims for Makaweli is unusually complicated. In this portion of Kaua'i, many people claimed lands in more than one ahupua'a. There are 117 claims made by 85 claimants which either describe or award claims in Makaweli Ahupua'a. Of these 117 claims, 83 are awarded but some of the awarded parts are located in Waimea or even Hanapēpē.

It should also be noted that there is more than one Kapalawai on the island of Kaua'i. There is a Kapalawai in Waimea and also one in Hanapēpē, which are clearly different lands than the Kapalawai of Makaweli which comprises the proposed project area. Of the 117 claims made for Makaweli, nine claims were for Kapalawai in Waimea and four claims were for Kapalawai in Hanapēpē. There were no kuleana claims made within the proposed project area of Kapalawai, Makaweli. There is an ahi'i claim specifically for the fishpond within the project area but it is not awarded.

The Māhele land documents suggest a pattern of the extensive exploitation of the Waimea-Makaweli-Mokuone river basin. The ahupua'a of Makaweli is bounded by the Waimea River on the western side at the shore. The Waimea River is fed by the Makaweli River tributary a short distance up the river, and the Makaweli River, in turn, is fed by other streams such as the Mokuone Stream. These are the stream valleys where, at the time of the Māhele, people were settled. Waimea, at this same time, had the greatest population on the Island of Kaua'i and Makaweli's land use is closely linked to Waimea, with some claimant's living in one place and farming in the other or vice versa. There is a slight preference for a house lot in Waimea, but several have house lots in both ahupua'a. Visiting ships were probably supplied with food from both districts when they stopped at Waimea Bay.

The fort, at the mouth of the Waimea River on the Makaweli side of the river, had seen action in the rebellion of 1824, when O'ahu forces put down the uprising against the Kamehameha dynasty. The kōa or soldiers at the fort were given lo'i lands nearby the fort so they could help raise their own food. Twenty-two of the Makaweli claims are for fort soldiers, who generally claim a single lo'i or mo'o. Most fort soldiers were given land in the 'ili of Kaho'omano, with some others in Hakioa, both located quite close to the fort.

There are 119 (ʻāpana or pieces) in Makaweli awarded claims. Awarded ʻāpana can be seen on the tax maps for the 'ili of Hakioa, Kaho'omano, Kakalae, Kaloulu, Kapalawai, Kolekalo Manawai, Pu'ulima, Wai'awa'awa and Waikaia all located along the Waimea River, the Makaweli River or a major western tributary of the Makaweli River (Figure 5).

A major problem in reconstructing *Māhele* era settlement patterns is that tax maps and other readily available historic maps do not show *ʻiʻi* areas for claims or awards in Huakaule, Kahalāi, Kahana, Kahola, Kaikolu, Kalā auʻōkala, Kamakaʻelīʻelī, Kamoʻouli (Kamoʻonīʻi), Kaneli, Kaohūihau, Kapuemanu, Kaunūloa, Kiele, Kohiana, Kūkuhoehoe, Kulā amokuʻaluli, Kumūiki, Mahāhāi (Mahaemae), Manini, Mokuone, Nonopahu, Olokalau, Olokele, Palaloa, Piliamoʻo, Poleiwale, Uhihau, Waikui or Waialele. It is difficult to understand the entire *ahupuaʻa* settlement pattern when so many of the geographic areas of settlement are unknown. Perhaps these *ʻiʻi* were all along the western-most margin of Makaweli as is the case with the geographically identifiable *ʻiʻi* but for all we know they may have been widely spread out over Makaweli *Ahupuaʻa*.

There frequently, however, is some location data for these "lost" *ʻiʻi*. Ka Lāʻauʻōkala is a canoe landing, and we presume it is at the shore or on the Waimea-Makaweli drainage. Kahana is described in the claims as being at the *mūliwai* or mouth of the river. The Mahāhāi Ditch is shown on maps running alongside the Makaweli River at the junction of the Makaweli River with the Waimea River and we presume the Mahāhāi claims would be along that ditch. Olokele *ʻiʻi* may have been the entire Olokele Valley. The Nonopahu claim is in the same areas as those for Koleakalo, up the river.

Of these 117 claims with 119 *ʻāpana*, there are 223 *loʻi* or *mōʻo* (which presumably included *loʻi*) enumerated. The majority of these *loʻi* *ʻāpana* are in Hakioa (28), Kahoʻomano (26), and Kakalae (23). Thus the vast majority of *loʻi* claims were in seaward portions of the Waimea and Makaweli Rivers. There are claims for 31 house lots, and presumably, some or all of the 22 soldiers were still garrisoned at the fort. The house lots tend to be in *ʻiʻi* closer to the shore, and some along the rivers. There are 19 claims for *kūla* and these are pastures or gardens scattered in among the *loʻi*. Gardens are very much a part of the Makaweli landscape and appear in the claims in several different guises. There are twelve claims for *kāʻāpui*, for a *kūla* garden, three others for gardens in house lots, three for a *pā kahu* (cultivated garden), and one for a taro *kūʻāpui*. Many claims mention the various *ʻauwai* or ditches, and the ditches carry the name of the nearby *ʻiʻi* or the *ʻiʻi* is named for the *ʻauwai*. Three claimants claim four *ʻauwai*. There is also a claim for a pig pen in Kaikolu and a goby fish enclosure in Manawai.

A potato planting claim is made by a soldier in an unknown location, but presumably near the fort. Many of the *kūla* may also have contained plantings for sweet potatoes. There is a claim in Kakalae for coconut and fig trees (236F) and a coconut grove (4291B) in Mahāhāi. Both mentions of coconut groves occur as markers for boundaries.

There are no *Māhele* claims for *wauke*, *olonā*, bananas, *hala*, orange or lemon trees as there are in most of the Kaula *ʻiʻi* *ahupuaʻa*. Although these cultigens may have existed, they have not been mentioned. This lack of diverse cultigens may also be the result of this Makaweli River area being so closely linked with Waimea, almost as a suburb. This Makaweli area was a large food factory probably for both Makaweli and Waimea, and in fact, perhaps even more for Waimea. There is much more diversity in cultigens claimed in both neighboring *ahupuaʻa* (Waimea and Hanapepe) suggesting that, at the time of the *Māhele*, Makaweli primarily produced food staples.

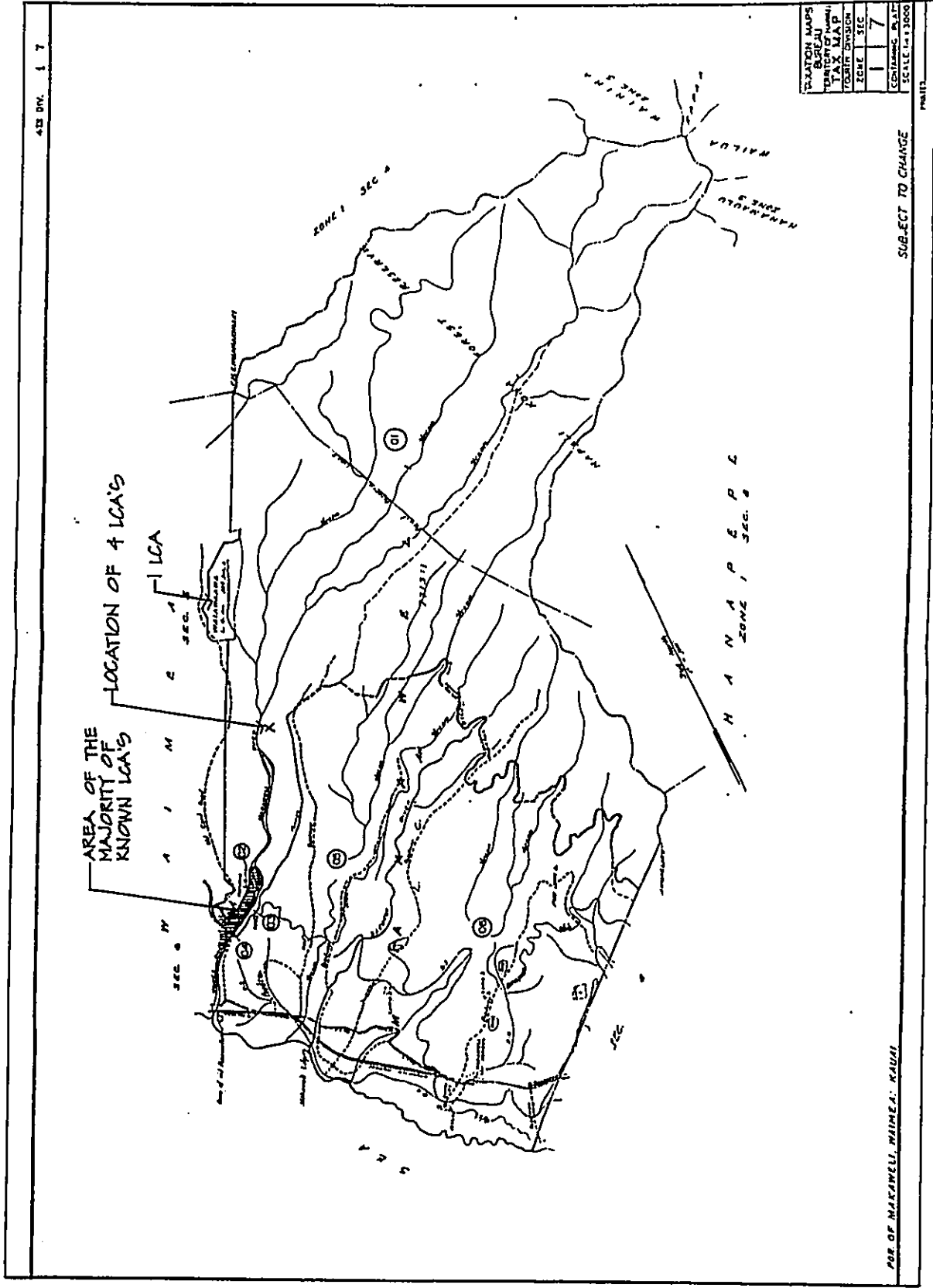


Figure 5 Map of Makaweli Ahupua'a (TMK 1-7) showing areas of known mid-1800's settlement

Within the Waimea-Makaweli-Mokuone valleys, area paths, *pāi* and *auwai* or neighbor's patches are the usual limit to the land claimed. A government road is mentioned several times and represents the cross-*ahupua'a* transit area. The paths go along the rivers and up through the different *'i'i* providing access between the higher lands and the shore.

Claimants of large tracts, such as the *ahupua'a* or the 298+ acres for the Mission lands provide information about highly prized fish ponds and salt ponds, but little else about the land within these large areas. Three *ai'i* have claims to the entire *ahupua'a*, Ahukai wahine, Emelia Keaweamahi, widow of Kaikoewa, and M. Kekūanaō'a for Victoria Kamāmalu. Victoria receives the land of Makaweli as well as a small *āpana* within Kaho'omano, the latter claim is slightly unusual, since usually all land not claimed by the *kūleana* tenants belonged to the chief/chiefs who was awarded the land. Both Ahukai and Keaweamahi speak about the fish pond, Kahe (also known as Kekupua Fishpond), in Kapalawai and the reader is referred to other sections of this report for that discussion.

Fishing is mentioned in the Mission claim #387, which can be seen on Tax Map Key 1-7. (Figure 6) some distance up a Makaweli River tributary. Kaumuali'i, former reigning chief of Kāua'i, gave Mr. Whitney the land of Kakalae near the junction of the Waimea and Makaweli Rivers and the food fish *auhau* ["tax"] and all other appurtenances, with which he took possession of in the *'i'i* of Kakalae and held it in peace under Kaumuali'i and all his successors until his death.

From our knowledge of Waimea and Hanapēpē, it is probably likely that the land just mauka of the shore provided *pāi* grass for housing and that there were possibly even wetland terraces in other valleys to the west of the Makaweli River, but we have no records. The *ai'i* used the Kekupua Fishpond and the Kapalawai area. There were a few salt ponds along the shore. The *Māhele* records leave us in ignorance about the eastern and central part of the *ahupua'a*, but provide us with a very detailed record of the western end of Makaweli, which was extensively cultivated along the Waimea-Makaweli-Mokuone river valleys.

The *Māhele* land use pattern at Makaweli was very strongly focused along the seaward portion of the Waimea-Makaweli-Mokuone river valleys. In the general absence of historic or archaeological accounts about the eastern and central part of the *ahupua'a* we are left only with conjecture. It seems likely that the creation of a Waimea mission station, a major trade center and a fortification at Waimea drew people in from the surrounding country. It seems probable that habitation and agriculture were more spread out throughout Makaweli *Ahupua'a* in pre-contact times. It does appear likely, however, that the westernmost margin of Makaweli was always the most populous portion of the *Ahupua'a* owing to the well-watered flatlands of the Waimea-Makaweli-Mokuone river valleys. Thus, to the extent that the historic record truly reflects settlement patterns of the late 18th to early 19th centuries, we can only assume that there was remarkably little Hawaiian activity at Kapalawai other than use of the fishpond.

The *'i'i* of Kapalawai

The *'i'i* of Kapalawai is located in the southernmost portion of Makaweli *ahupua'a* and borders the shoreline on the mauka side. In 1865 (see Appendix A for Sinclair-Robinson-Guy family history), Elizabeth (Eliza) Sinclair purchased the *ahupua'a* of Makaweli "according to its ancient boundaries" from Victoria Kamāmalu for a sum of \$15,000. She paid \$10,000 down and agreed to pay the balance in sixty days (B.C. Liber 19:416-417). Native tenant rights were not mentioned in the Warranty Deed for the sale. The records show that, from 1865 up until her death in 1892, Eliza Sinclair bought as many *kūleana* as possible within Makaweli. It was her intention to own all of Makaweli for her heirs who would inherit her lands after her death.

The ancient meaning of Kapalawai seems to be lost in obscurity but one can make some educated guesses based on a literal translation and by studying the landscape for possible interpretations.

1. In Francis Gay's *Makaweli Place Names of 1873*, the translation for Kapalawai is given as "The-water-moss". This Kapalawai refers to the sandy beach area at Hanapēpē. Indeed, a possible meaning given by Puku'i and Elbert (1986:307) substantiate this. A variant meaning for *pāia* is "seaweeds or scum". Located within the study region is a *tōko pu'uone* (inland pond). In an interview with Hawila Kaleohano, he states that there used to be a particular kind of *limu* (seaweed) that grew in the pond, which he has never seen anywhere else. This was further substantiated by Warren Robinson. None of the people interviewed knew the name of this *limu* nor had they seen it growing anywhere else other than in this fish pond. Following are excerpts from Mr. Kaleohano's interview regarding the *limu*.

HK: They [referring to the mullet in the pond] eat nothing but *limu*, you know, in the pond . . . And we used to go clean the *limu* because it's so thick, you cannot walk in. We used to push 'em and pile 'em on the side . . . I remember, the only time never had *limu*, [was] when the tilapia went in. 'Cuz, the cement, you see, where the outlet was, over here, the cement had crack[ed]. The tilapia went in and that was it. That was the end of the *limu*. Tilapia ate 'em all.

CSH: Now, when you say *limu*, what kind *limu*?

HK: I don't know what you call that kind *limu*, but was in that pond.

CSH: What color was it? Can you describe it?

HK: It's more like one hair, you know, the thing. And when you walk, it's all the way up to the top, and it floats. Go all the way to the bottom.

CSH: Kind of like 'ele 'ele?

HK: No, no. Not like 'ele 'ele. I don't know. That's the first time I see that kind seaweed.

CSH: And, what color was it?

HK: Green.

CSH: Light green or dark green?

- HK: Real light green.
 CSH: Was it smooth or did it have texture?
 HK: No, no. Kind of rough. And, that's what the *limu* was.
 CSH: Can you compare it to another *limu* that you've seen?
 HK: No.
 CSH: You never seen anything like it?
 HK: No. Because I ask the old man Kualo if you can eat the *limu*. He say, "no".

2. *Palaʻwai* could also refer to bottom lands (Ibid:311). This could be in reference to the location of Kapalawai on the flat bottom lands of the Makaweli *ahupuaʻa*.

3. *Kāpala* means to daub; *wai* means water, usually fresh. A possible translation could be "to daub with fresh water" (Wichman, unpublished manuscript:17).

The Robinson family has a different meaning for Kapalawai. The following is an excerpt from an interview conducted by Cultural Surveys Hawaiʻi (CSH) with Bruce Robinson (BR) and Warren Robinson (WR) about their knowledge of the meaning of Kapalawai:

- CSH: And what do you think the name Kapalawai means? Have you heard anything from your family or other Hawaiians?
 WR: Bruce, I think, knows but, I don't know.
 CSH: Have you heard anything about if it's related to the *limu*? ...
 BR: No. That name belongs to that little dish kind of area in the back here [in back of garden, near the old road]. Right by the little area in back of the garden. That's where the name is actually. 'Cause the *pala* is a little shallow dish kind of thing that use to hold water. And my dad and Uncle Aylmer both said that's what that name means. ...
 WR: And that would be important in those days 'cause there wasn't much water back in those days ...
 BR: There's a small little clay area right there and it goes into the *mauka* part of the garden.

Interviews with other informants did not bring to light any known meanings for Kapalawai. Other than Bruce Robinson, all informants stated they had never heard a translation for the place name of Kapalawai.

Within the Kona district, there are three different localities named Kapalawai. There is a Kapalawai in Waimea (*mauka* and not near the shoreline); there is a Kapalawai in Hanalei, which is a sandy beach area; and there is the 'ii of Kapalawai in Makaweli which comprises the project area. It is very possible that all three Kapalawai have different meanings attached to them. In Hawaiian culture, place names are very important. The fact that a name has been given signifies its importance. Often, place names commemorate legendary and historical events, important activities, features and qualities of the

landscape, people's names, as well as names of gods and so forth. Likewise, place names do change over time and with usage or a place can be given a new name to commemorate a more recent event that perhaps holds more meaning and importance for the present generation. It is very possible that an older, obscure meaning for Kapalawai did at one time exist, but has not survived the passage of time. Or, perhaps, an ancient meaning of Kapalawai did refer to the *limu* that grew in the 6-acre pond on the property and the Robinson family adopted a more recent meaning which was relevant to them and their use of Kapalawai. Without a knowledgeable native informant or previously documented information, it is difficult to be certain of its traditional meaning. There do not seem to be any traditional *'ālelo no'eau* or *mo'olelo* (stories) associated with the name of Kapalawai that might help to interpret its meaning.

Kekupua Pond

At Kapalawai, within the project area, is a 6-acre *loko pu'uone* (inland fish pond) commonly known today as Kekupua Pond. According to the previously-mentioned land claims, the pond seems to have been known by two names: Kahe and Kekupua. Bruce Robinson clarifies that Kahe and Kekupua is actually the name of two of the three known fresh-water springs within the pond. This information was passed down to him from his father who got the information from Kualo, a native Hawaiian informant. The few *kāpuna* born in the 20th century who do remember a name for the fish pond said they knew the name to be Kekupua because of its proximity to Kekupua Stream. Some people simply refer to it as "Kapalawai Fishpond" because it is located at Kapalawai. It is likely, as Bruce Robinson suggests (*Synopsis of Interviews*), that the pond went by more than one name and the names changed over time due to common usage. Following is an excerpt from an interview with Aletha Ka'ohi of Waimea:

- CSH: Now, when you were growing up, how did you know the name of the fish pond?
 AK: ... the fish pond was well known to everybody. This was a big [emphasized] fish pond. And I knew that it was Kekupua because I would walk with my father and go fishing with him. I was his bag girl.

Information obtained from the oral interviews regarding the fish pond, for the most part, was related to the Robinson era of occupation. Several people, who had been employed by the Robinsons and had either lived or worked at Kapalawai, did not even know the fish pond existed. Early turn-of-the-century photos from the Robinson family albums show the fish pond being surrounded by a very high fence. Speaking of the fence, Warren Robinson replied,

- WR: The fish pond had a big fence. [A] really high, wooden fence.
 CSH: Why was that?
 WR: I guess guys used to come night time. (Laughs.)
 CSH: Was there a problem with poaching?
 WR: I guess. Otherwise, they wouldn't have built a fence there. I'm sure the people would go catch the mullet.

In the late 1930's (1937-39) Kawika Kapahulehua remembers staying at Kapalawai and discovering the fish pond. Following is an excerpt from his interview.

KK: But, you know, small kid, new place. You go around checking it out.

And I first found that fish pond looking around . . .

CSH: So . . . the caretaker let you walk around?

KK: Yeah. [I] Follow him. And he explain what he was doing. Pulling all the dead leaves, cleaning the pond. 'Cause, otherwise, the fish get sick. I said, "Yeah. There's lotta small fish." He says, "Yeah. And we have to feed 'em because they don't go out to the ocean. As soon as they come in, we put a very small screen to block them from going back out. But the water can go back and forth. Ocean water and fresh water mixes. So they can stay in here."

CSH: . . . Were there any other fish besides mullet?

KK: No. Just mullet

Information given by Hawila Kaleohano indicated there is a Hawaiian legend related to this fish pond which involves a *mo'o* and a particular *pāhaku* (stone) the *mo'o* frequented. Following is the interview excerpt where Mr. Kaleohano relates a story told to him by a native Hawaiian informant known as Kualo who was born around 1850.

Get one *uohine mo'o* [water spirit often seen in the form of half-human and half-lizard]. In the old days, they say beautiful lady. And he tell me, you go up there by the monkeypod tree, under the coconut, get one flat rock. So, I went there and sure enough that flat rock is still there. He said this *kupua* [supernatural being having more than one form] sits there. He said the lady is nice, beautiful. That's all he says. He said if you like see the lady you come real early in the morning. That was before in the old days. He said you go early in the morning before sunrise, you see her sitting on the rock, combing her hair.

He said one man was taken by that lady way in the old days. He said he, probably, . . . was telling lies, but. They say the side that was against the lady, all scale(s). He said the Hawaiian guy died.

This is all the information Mr. Kaleohano could remember about the *mo'o uohine*. He did not remember any other details or if the *mo'o* had a name or if the name was associated with the fish pond. It is not known if the *pāhaku* was used as a shrine and there is no evidence to suggest that this was so.

V. SYNOPSIS OF INTERVIEWS

Following is a brief characterization of each person interviewed, along with a short synopsis which incorporates portions of the interviews and highlights key points of the interview.

Ohu Ho'okano: is of Hawaiian ancestry and was born on February 25, 1926 at Kekupua on Robinson family land, where he resided and worked until his retirement from Makaweli Ranch. The interview was conducted at his place of residence in Waimea, on April 29, 1999. At the time of the interview, Mr. Ho'okano was 73 years of age. His daughter, Nani, was present during the interview.

As he tells it, his grandparents . . . came with the Bertrams and they went afloat to Ni'ihau . . . From what I gathered, the first Robinson that came over on the sailboat, they stop[ped] in Honolulu at Waimea Bay somewhere on their way. They picked up my grandfather and my grandmother [who] went with them to Ni'ihau. Whenever visiting Kaula'i, his grandparents usually stayed at Kapalawai. Eventually, his grandparents moved from Ni'ihau and settled on Kaula'i to work for Selwyn Robinson, who ran Makaweli Ranch at the time. Ohu relates that they lived in the houses near the Portuguese oven, which are no longer standing today. He says, . . . had da kine houses over here. I don't know if that's for the workers or what, but that's when my grandfather and them came over from Ni'ihau, they were staying down here before they moved out. His grandparents eventually left the employment of the Robinson family and moved to Waianuhia where they had their own place.

Ohu says about himself: . . . I never been too much with Kapalawai. I was living mostly up in the ranch. I was born up in the ranch, yeah? And all our life we stayed in there. Even though Mr. Ho'okano felt he didn't know much about Kapalawai, he was quite familiar with the buildings on the property, the landscape, fish pond, pump house, paddocks, dairy and many of the activities that went on there during the time of his employment. His familiarity with the project area comes from hearing stories from his grandfather, father and brother and, also, the fact that his father was born at Kapalawai and lived there before moving up to the Ranch. Following is an excerpt from his interview regarding how he began working for the Robinsons.

CSH: What is your connection to the Robinson family . . . how did you get to work for them?

OH: Well, my grandfather came up with the Robinsons but, then, my father never did go out [meaning he never left the employment of the Robinson family]. Well, he was born Kapalawai, then he worked. He stayed there 'til he went *brake* (die) . . . He lived there 'til he worked for Robinson. And, then, after my dad died, I work[ed] with the ranch before he died. And my brother worked for the ranch all his life.

Like his father, Moses Kaubi Ho'okano, before him, Ohu followed in his footsteps and also worked as a *paniolo* (cowboy) for the Ranch. He reminisces about his *paniolo* days of fixing fences, driving cattle and branding:

OH: ... it's a big place, this. I travel from Wahiawā to Waimea Canyon, from there up across to Hanalei, Kalalau [and] all that.
CSH: ... By horse?
OH: By horse. But, we go and camp. We was never home. Those days we were all out ... Because we have so much place to work, we have no time. One week in Waimea Canyon, one week up Makaweli, then we go to Hanalei side, stay one [or] two weeks. Then, we get to Kalalau, stay there for two weeks. ... Kalalau is the hardest one because we had to lead 'em out on the trail and the trail is only so narrow. The bulls more big than the mule. That's hard work, Kalalau. We are always on the go. We never stay. It's so big that we gotta do a lot of traveling.

He remembers that they used dogs to help round up the cattle, especially in the deep mountain forests:

When you usually drive in the forest, we cannot do nothing in the forest, cannot chase. So, what we do is just hang traps, rope traps all over and let the dog go get 'em. He chase 'em around 'til they run. All we do is take 'em out of the rope and tie 'em up and all that. He do our chasing for us ... until we get 'em all together and then come straight home. And, there would be no more truck. We drive 'em all the way back to the Ranch.

Mr. Ho'okano continued to work for the Ranch until he retired.

Often, his *paniolo* activities while being employed at the Ranch interfaced with activities at Kapalawai. For example, speaking of the dairy at Kapalawai, "... Used to have the dairy. ... straight in back of the house. Because, I remember them milking the cows and come down. Because, we were supplying the cows for milking from the ranch."

Specific to the project area of Kapalawai, Mr. Ho'okano recalled that much of the land fronting the main house was open pasture area with horses and paddocks. The dairy was located in back of the house. The "camp houses" and the stone walls were all in place. There were also a couple of employee houses near the Portuguese oven and a few *lo'i* which the workers cultivated for their personal use. Referring to the people now living in the camp houses at Kapalawai, he says, "... all new people now. No more the old ones. I don't know where any of them now. They moved out and pau."

When he was little, he was a bag boy for his father whenever he went fishing. Referring to accessing the beach at Kapalawai for fishing, he seemed to think that the general public stayed away from the beach area fronting the project area and that most

fished at Pākālā or down by the Russian Fort. Because he worked for the ranch, he was always allowed to hunt and fish on Robinson property, as long as he "asked permission", but accessing the fish pond was definitely off limits.

CSH: So, if you wanted to go fishing down there [the beach area], would they [Robinsons] let you?
OH: Oh, yeah. I used to go. My father, when I was small, I go with him, and I follow along side the beach while he throw net. I was a bag boy. So, what he catch, put 'em in the bag.
CSH: What kind fish you used to catch down there?
OH: All kind. We catch *manini* and mullet, usually.
CSH: Could you get fish from the fish pond?
OH: No. No fishing over there. No fishing.

In regard to the fish pond, Mr. Ho'okano recalled the sluice gates, the island in the middle, and the raised embankment with coconut trees which divided the pond into two sections.

CSH: Do you know anything about the fish pond?
OH: Yeah. I know where that fish pond is. It's a big fish pond.
CSH: Do you remember the name?
OH: I don't know ... It has a little island here, someplace. And, used to have the outlet here that goes down ... and that outlet get blocked until the water rise up so far and then [goes] over and out ...
CSH: So, when the water overflows, is that why this area is marshy?
OH: No. Get all taro patch over here. I mean, just a swamp ... Have taro patches. Because, the people that used to live down here in this houses, this was their taro patch. (Referring to the milkman and caretaker who lived in houses near the Portuguese oven.) ... The water comes from here in the corner here.
CSH: Inside the pond?
OH: Yeah, in the pond ... And, then from here we put in one big pump house ... That used to irrigate all this places here ... from here all the way down here in front the [main] house and in back of the house. The pump used to pump all that ... always [had] water coming out ... and never did run dry that pond. Never did run dry.
CSH: Do you know anything about a spring that feeds the pond?
OH: No. I really don't know too much.

When asked about the rock structure, he was aware that it existed and he replied,

OH: That's just like one *keiazu* over there. I don't know. We never — as long as I working over there, they never let us go in there because that place is fenced out, that little portion here ... It was fenced out from the house.
CSH: So, you were never allowed to go there?

OH: No, no. I know, but there's something in there that they never like us go in there.
CSH: Have you heard any stories about that area?
OH: No... Just keep out of there, that's all.

It should be noted that although Mr. Ho'okano used the term "*keiaua*", he did not have any concrete information to support this. He probably used it as a general term because in his experience, he had seen other known *keiaua* sites up *mauka* in the Ranch area, which might have looked similar. Because the cowboys were asked to stay away from this area, he felt it might have some relation to the rock structure. He made no mention of the possibility that it could have been an agricultural clearing pile.

Mr. Ho'okano did not have any knowledge of any other sites (other than the fish pond and the rock structure) within the proposed project area. He also did not have any specific knowledge about burials at Kapalawai. His knowledge regarding burials and sites are related to his experiences as a *paniolo* working up at the ranch, in the *mauka* areas. He says,

OH: You have all the old people that lived up in the valley. When they passes [died], they put back up in Makaweli Valley.
CSH: Oh. They're not buried down here [referring to the coastal area]?
OH: No.

Mr. Ho'okano says about the old timers and the old cowboys he used to work with, "They all gone on me. Everybody's gone." About five months after the interview was conducted, Mr. Ho'okano passed away.

Hawila Kaleohano: The interview was conducted on May 18, 1999 at Mr. Kaleohano's home in Hanapepe Valley. Hawila Kaleohano was born July 15, 1934 on the island of Ni'ihau. He lived there until he was sixteen years of age. In 1950, he moved to Kaua'i to seek employment and help his parents who were living in Waimea at the time. Immediately after his arrival on Kaua'i, he began working for Aylmer Robinson and Alika Robinson at Kapalawai as a laborer milking cows, fixing fences, cleaning the fish pond and doing whatever chores needed to be done around the property. He worked there for about thirty years before moving over to the sugar plantation in 1982 to continue working for the Robinsons. Twenty-five of those years were spent working with Kualo, a native Hawaiian, who was fluent in the Hawaiian language. He says that Kualo worked with them until he retired at the age of 101. He recalls that at 100 years old, Kualo was still riding his horse. About his early years of employment he says,

I started to work right away. 'Cuz, Robinson gave me job. 'Cuz my dad didn't have. So I work there 'til Aylmer died and I moved to the plantation. Sinclair gave me a job to the plantation, so I moved. 'Cuz when he retired, I took over. I was the supervisor over there [at Kapalawai]. Until Aylmer died. Then he [Sinclair] move me to the plantation because Eleanor needed only two person[s]. One yard and one gardener to work for her.

When Mr. Kaleohano came to work at Kapalawai in 1950, he recalls that the camp houses were in existence and that they had been remodeled and fixed up. Down by the fish pond, there were two other plantation-style cottages. John Rita, the milkman, had built the Portuguese oven (still standing) and lived in a house right next to it. When Mr. Rita quit, a Joe Nunes took his place and lived in the other house close by. When asked if there were any *lo'i* in the project area, Mr. Kaleohano recalls that there were about three taro patches "right around the pond" area, which both Rita and Nunes maintained for personal use.

One of Mr. Kaleohano's duties was to milk the cows for Eleanor Robinson. He says, "In the morning we drive 'em in. 'Cuz we keep the calf in the milking pen. And, then, when we get the mother inside there, we tie the cow in the chute, then we bring the calf out, and then he suck the mother, and then we pull 'em away and milk the cow. After I fill up, well, I use to milk three buckets, and then we bring 'em to the kitchen for the maid pasteurize 'em. Then, we let the cattle in the pasture again. Then in the afternoon we drive 'em in... separate the mother from the calf."

In 1950, Mr. Kaleohano reminisces that the pond was clean, just as the old photos from the Robinson family album depict it. There was no build-up of debris and overgrowth as the pond was cleaned on a regular basis. Following is a portion of the interview which discusses the fish pond.

CSH: Do you recall hearing a name for the fish pond?
HK: The old man Kualo used to tell me the name before, but, I forget. That time, we never think nothing, that you guys was going research about that place... 'Cuz, he used to tell me the story about this place, about a pond and all, but, you see, then is 1950, now, is what? '99? So I no more the kine good memory.
CSH: Do you remember anything about the story he told you about the pond?
HK: According to Kualo... This pond was here before Robinson went own 'em. He tell me one name about this pond, but, somehow I forgot. My sister-in-law tell me to sleep it. But, I try sleep, I couldn't think of the name. I know had one real nice name for this pond. He say this. The people [whom] used to own this used to be the King and Queen in the old days. And then, you know, they move away. And, then, Robinson bought the property, he pay 'em cash. That's how he bought the land and the pond together.

Regarding the size of the mullet in the pond he says, "When I went to work there, used to get mullet. And the mullet, I tell you, you won't believe how big it is!... I tell you, the mullet is big like this (shows me with his hands). And the old lady used to tell me, Old lady Alika [used to] tell me, 'That's not mullet. That's shark!' 'Cuz the mullet was so big. You put 'em in the burlap bag [and] the tail stick out. You know how big the burlap bag is... But, I tell you, that's the only place I seen the mullet that big."

Whenever Alika Robinson wanted mullet for dinner, she would send a worker to go catch it sometimes in the afternoon, after lunch. Mr. Kaleohano relates that his uncle, Eddie Kahale, would catch the mullet with a gill net.

- HK: She ask us for catch, say, seven mullet. So we catch. And, we cannot leave 'em there. So, maybe, we bring 'em to her. Maybe about nine or ten . . . we take 'em up to the kitchen and she pick the ones that she like. She only like about three big mullet. The biggest mullet. The rest, she give 'em to us. But, whenever she make dinner, like that, that was the specialty on the table.
- CSH: For entertaining?
- HK: Yeah. Steamed mullet.
- CSH: How did it taste? Did it taste different?
- HK: Taste good! I tell you, I never taste mullet like in there. Plenty people tell me taste muddy. They batoney! 'Cuz, I know. I eat that mullet.
- CSH: Did the mullet look different as far as color or anything?
- HK: No. It's the same. Because been in the pond for so many years and they eat nothing but *limu*, you know, in the pond. And we used to go clean the *limu* because it's so thick, you cannot walk in. We used to push 'em and pile 'em on the side.

When asked about the springs in the pond, Mr. Kaleohano related:

- CSH: Now, what feeds the pond, as far as the water source?
- HK: Spring water. There's no water stream coming in here. But, there's three spring water hole in there. Three. And, I know that because I used to work in that pond. After lunch, Robinson make us go inside there and clean. And when you come to the spring water hole, the ground is hard. That's the only way you can tell where the spring water hole is.
- CSH: It's inside [the pond]?
- HK: In the center of the pond. And the water comes out steady.

Mr. Kaleohano says that in the old days ("before his time"), ". . . they used to clean the *limu* with the boat. They used to throw the *limu* inside there and go on the side." In the following excerpt, he talks about how they used to clean the *limu* from the pond when he was there.

- CSH: Did you folks ever use like a boat or anything to go inside the pond when you had to get into the middle of the pond?
- HK: No. Just one thick four by twelve, about 15 feet long. And I remember, they use to get spikes, iron, for put on, for pushing the *limu*, the weeds. That's the kind, not seaweeds, but, we used to call *limu*. And that's how we use to clean that pond. We push the *limu* on the side and we throw 'em out with the pitch fork.
- CSH: But, the plank doesn't go all the way across?

HK: No. Because we gotta take little by little. 'Cuz we not machine for push. Gotta push what we can. That's how we use to clean that pond before.

- CSH: And, how long would that take you?
- HK: The only time we go in there, when half day, after lunch. Then, Robinson want us to go keep the pond clean. So, that's when we go in and push. And, somebody stay on the top and scoop the *limu* and pile 'em up.
- CSH: How often would you do that?
- HK: That's everyday. I remember the only time never had *limu* [was] when the tillapia went in. 'Cause the cement, you see, where the outlet was, over here, the cement had crack. The tillapia went in and that was it. That was the end of the *limu*. [The] tillapia ate 'em all.
- CSH: Now, when you say *limu*, what kind *limu*?
- HK: I don't know what you call that kind *limu*, but was in that pond.
- CSH: What color was it? Can you describe it?
- HK: It's more like one hair, thing [but, not like *efe'efe*]. And when you walk, it's all the way up to the top and it floats. Go all the way to the bottom . . . That's the first time I see that kind seaweed.

Mr. Kaleohano further describes the seaweed as being a "real light green" in color and having a "kind of rough" texture. According to what Kualo told him, it was not an edible *limu*. By the early 1980's, when Mr. Kaleohano transferred to the Plantation, the *limu* had disappeared. He recalls that there was some water lilies growing in the pond, but not many. "But after that, nobody take care that pond. One time I went back there was full of bulrush inside there and with water lily."

Mr. Kaleohano was the only informant who said that people could fish in the pond if they asked permission. However, he reiterated that people were not allowed to fish for mullet for personal use. Here is an interview excerpt.

- CSH: Was anyone allowed to fish from the pond if they wanted?
- HK: Yeah. As long the people live in there, you ask. You ask Eleanor or Aylmer. They tell you to go. After work, though. Not during work hours. They allow you to go. Not to catch mullet, though. To catch all the *o'opu* and, what you call, tilapia, [and] whatever inside. ["Had *awa*, too, inside."] But not the mullet?
- CSH: No. Only when they tell you to catch for Alika them, we use to catch.
- HK: No. Only when they tell you to catch for Alika them, we use to catch.

When asked about the rock structure, Mr. Kaleohano jokingly referred to it as the "*haole heiau*". He was adamant that it was a clearing mound from the adjacent cane field and that it was not a *heiau*.

HK: The archaeology people thought was a *heiau*. But, actually, it's not.

CSH: What do you know about it?

HK: That's the rock from Akia I. That's the cane, where the corn is right now. That's Akia I.

CSH: Oh, that's where they plowed that whole field.

HK: That whole place. Yeah. That place had nothing but rock. So, they went clean that place up, the rock, and they went take the rock and pile it over there on the railroad track.

CSH: What railroad track?

HK: They used to get, you know, in the old days. Never had truck before. They used to pull with the tractor. The Robinsons use to get railroad track. So, that's how use to, they pile 'em over there, the pile stone. When they tell me the archaeology went over there and put ribbon over there 'cuz *heiau*, that's not no *heiau*! That's all the stone from there. When they went clean that place up, right after that, the war went break out in 1941. So they had only cattle in there. Then they stop. After the war, then they plant cane inside their place.

Regarding the age of the stone walls lining the main driveway and the wall that borders the property on the western boundary, Mr. Kaleohano says, "The stone wall was there, from before. All the way out to the highway."

CSH: Do you recall hearing when that wall was built?

HK: Was there already, when I work there. I know when I was there in 1945, when I was a small boy, the thing was there already. I was living in Kapalawai that time. You see, when we come out from Ni'ihau, that the place we used to stay. We stay there until we go back to Ni'ihau again on the boat. Every time we come out, I use to stay here with my uncle Kahale and my aunt. We use to live in Kapalawai, as far as I know.

CSH: And then this [rock platform] was already there?

HK: Was already there.

CSH: Do you remember going there to look at it or playing around the area?

HK: Yeah. We use to go walk all the way down there, all the way to the beach.

CSH: You never heard Kualo talk about the rock structure?

HK: It's not no *heiau*, no nothing!

CSH: So, before 1940's when they cleared the field, that [rock platform] wasn't there?

HK: Right before the war, that's why they went go — I think their plan was to clean that pasture to plant cane but, the war break out and they stop. And that's where they went pile the stone. By the railroad track. They pull the stone over there and they unload 'em back and forth . . . And then after they finish, they look it out.

CSH: You've never heard any stories about a name for this area? Or about it being a possible *heiau*?

HK: No, nothing. . . Because all that place, you see, I used to work at the plantation. Every time we finish . . . harvest the cane, the tractor come in and plow all over the field. So we never see nothing there. No bones, no nothing. The only thing come out is rock. You be surprised. Every time we harvest that field, nothing but stone come out.

Mr. Kaleohano recalls what the vegetation was like on the property when he was a young child in the early 1940's. He says that there was grass ("Mahiki and all that"), the pastures were well-kept and not wildly overgrown. There was *kiawe* in the pastures and "all the way down the beach line . . . The only place never had *kiawe* is in the front of the house. In the front of this house, all the way to the beach, never have *kiawe* trees. But both side of the front, get *kiawe* tree."

An old iron try-pot was located at the top of the fish pond. Mr. Kaleohano explained that old try-pots (a remnant of the whaling and sugar plantation eras) were placed in the pastures and filled with sugar molasses. Licking the molasses would make the cattle thirsty, ensuring that they would drink enough water. It is also likely that the molasses provided some kind of nutrient value to the diet of the cattle.

Mr. Kaleohano had no knowledge of any settlement areas near the beach at Kapalawai.

CSH: Did Kualo say anything about, a long time before the Robinsons, did he ever talk about any Hawaiian villages down by the ocean?

HK: No. He say never did get nothing. They say, most, was up in the mountain. 'Cuz Kualo used to live up the kine, up Makaweli. Makaweli Valley, that's where he use to live. They call 'em Waikolu . . . Use to live right on the side of the mountain. They say that's where the most Hawaiians use to live. Because Hawaiian Sugar use to run the Plantation way over there. And when the Hawaiian Sugar gave up, Robinson took over. So, he say, as as he know, never use to get down there. Only the working people like Joe Nunes and Rita. That house was put there. Then the rest was Pākālā Camp. That was during Hawaiian Sugar time.

As Mr. Kaleohano tells it, access to the Pākāla surf spot and Infinity Beach, on the Pākāla side of Makaweli Landing, was opened up by Eleanor Robinson during the "time the first hippies came to Kaula I". He says, "... the brother (Lester) use to arrest the hippies for trespassing . . . and then he said he was tired of reading in the paper about getting arrested and then she opened this right of way to go down . . . if anybody want to go to the beach, they have a way to go to the beach. Up 'til today it's still open. Because of her. This was her property." By the 1960's, people would use the access to the surf spot and once there, one could walk all the way down the beach to the Russian Fort. Access was allowed, "So long you no go on the property." Fishermen accessed the shoreline by asking for a pass and driving down through Akia 1 to get to the shoreline — "That's how was before in the old days." In Mr. Kaleohano's opinion, fishing used to be better in the old days — "mullet, *manini*, *limu* 'ele 'ele, and all kine". Here's what he had to say about the fishing along Kapalawai.

HK: Well, to me, before was better. Until this OSHA law came up. They stop the water from flowing in the ocean. That was it. Never had no fish. You know, the *limu* use to grow when the water flow to the ocean. And, when they had the law, for water flowing to the ocean because of poison or what, never had no *limu* growing on the reef. Before that [was] nice and green . . . I know. I use to go dive around there and it's bare the reef. Before, it's nice and green, the *limu*. Since the law came out, *pau*. That was it.

When asked about Mahaikona Stream which runs on the east side of the fish pond through the property, Mr. Kaleohano related that, according to his knowledge, Mahaikona Stream is further up *mauka* and that the portion of the stream that runs through Kapalawai is actually called Kekupua Stream. (This information was also confirmed by another informant, Aletha Ka'ohi.)

HK: All the way up. All the way. Mahaikona is way up in the mountain. But, the water come from there, all the way down. That's why they call it Mahaikona Stream.

CSH: But, you guys always referred to this as Kekupua Stream?

HK: Well, according to what I hear from Kunlo, they use to call it Kekupua Stream.

Today, Kekupua Stream is shown on USGS maps as Mahaikona Stream, which is what everyone calls it today.

After the interview was actually ended, Mr. Kaleohano began to share a story about the fish pond that he heard from Kualo. Following is the interview excerpt.

HK: Get one *wahine mo'o* [water spirit often seen in the form of half-human and half-lizard]. In the old days, they say beautiful lady. And he tell me, you go up there by the monkeypod tree, under the coconut, get one flat rock. So, I went there and sure enough that flat rock is

still there. He said this *kupua* (supernatural being having more than one form) sits there. He said the lady is nice, beautiful. That's all he says. He said if you like see the lady you come real early in the morning. That was before, in the old days. He said you go early in the morning before sunrise, you see her sitting on the rock, combing her hair. That's why when we use to go to the pond we think about that. [Laughs.] But never did happen when we was working there.

CSH: So, if you're facing the highway, I think to the left of the pond is a big monkey pod tree. That monkeypod tree? [Not the big monkeypod with bouganvillea climbing up it on the Waimea side of pond.]

HK: When you looking this way, it's on the right. [Kekupua side of the pond] You see, the pond is like this, so she's gonna go up to the highway. Way on the *mauka* side, the monkeypod tree is right [here]. Get one big monkeypod tree. Right down [by the water's edge] get one coconut goes up like this. [Shows me with his hands how the coconut tree curves.]

CSH: And get one big flat stone?

HK: One big flat stone.

CSH: I gotta go look at it. Might be all overgrown.

HK: I think cannot see because I only look at your picture and it's all covered up. I think when they clean up that place, they will find [it]. Big flat rock. That's where the lady come out . . . Nice flat stone. It's right under that tree. That's the story he tell me, but I never see.

HK: But they say they was gonna clean the pond. If they clean that pond up, would be nice. Really nice. It's good for the tourists.

CSH: So, do you think the name of the pond was related to the *mo'o wahine*?

HK: I don't know. Something like that maybe. But that's the story he told me about the pond. I look at him, I tell him, "You sure?" He said one man was taken by that lady way in the old days. He said he probably, he was telling lies, but. They say the side that was against the lady, all scale[s]. He said the Hawaiian guy died.

CSH: Oh, they got him out?

HK: The lady brought him back. And he tell his side of the story. He said under where the lady look him, she just look him under the arm and then went. He say he cannot tell where it is, but he say underneath is him back. And they said he went crazy. And then the Hawaiian died. Fell in love with that [kupua]. [Laughs.] That's the story he told us.

He tell us, right by that corner over there if you go early in the morning. So we use to sneak and go and try look early in the morning but we never see nothing. When we were working in the pasture, the first thing we try go over there, but I never did see. I guess it's not meant for us.

CSH: Did he tell you any other stories like that?

HK: No, that's the only one. That's the only one he told me about that pond. About that lady.

CSH: Oh, too bad you can't remember the name.
 HK: Like I said, in those days you not interested in keeping the name. But, we was young at that time. We could care less. Now, when people ask, oh, I should have.

CSH: Did he ever talk about what the name of the pond meant. Maybe you would remember that. The meaning.
 HK: Still that. I don't know. The only thing I remember [is] about the lady. [Laughs]

CSH: That was the memorable part.
 HK: Yeah. Because he say, "That lady is so beautiful. If they wanna show you, you see 'em."

CSH: Did he ever say he saw her?
 HK: He say he seen her. He seen her. But you gotta sneak up. You cannot show yourself. He said, before the sun rise, she stay on that stone. Beautiful lady.

CSH: Did he describe what she looked like besides beautiful?
 HK: He said she have long hair, slim build, but you only can see from here up.

CSH: From the waist up?
 HK: Yeah.

CSH: The other part?
 HK: In the water, I guess, sitting down.

CSH: So the stone is right at the water's edge then.
 HK: Just by the water's edge. That's the only thing I remember. He use to tell us the story. But we try, try look. But he said, "Well, if not meant for you, you wouldn't see her." That's the only story I remember. When we use to work in the pond, we came across the spring water hole, I tell, oh better not be the [kupu] [Laughs]. Yeah, you know. Kinda spooky. So, I use to go down. It's kinda pretty deep, you know.

CSH: How deep do you think?
 HK: Oh, it's deep. 'Cause I go down all the way 'til I covered, inside the hole. I don't know now. Now, maybe it's all filled with mud. But I doubt it, because on the side was all hard, you know. You know with all the bullrush and all that. Maybe it's covered up.

CSH: So when you say it's hard around where the spring was, what do you mean?
 HK: You see, the water hole [is] right here [and] right around the hole, the ground [is] hard. The dirt is not soft when you stay away from the water, the spring water. Right around the opening, when you come close to that place, the ground hard. I guess the water coming up like that.

CSH: And then, you would actually go —
 HK: Clean the *puka*. But, I can touch the bottom.
 CSH: Inside the *puka*, you can touch? And that's when you can feel the water coming up?

HK: Yeah. You can feel the water coming up. Where the water coming from, I don't know. Get three water holes I know. Spring water holes in there.

CSH: So, *limu* and stuff would get stuck inside? Is that why you would clean?

HK: No, no, no. The *limu* never stuck. On the side of that hole use to be *limu*, but not where the water hole is. Water hole is always clean. But, outside of that is where use to get the *limu*. So that's why we use to go with that plank. They get a rod, a stick inside, more like a rake. So we use to push. About two guys. Push the plank on the side and just throw 'em out with the pitch fork.

HK: That's all I know. Too bad I cannot tell you the name.

On May 20, 1999, Mr. Kaleohano visited the project area with CSH representative, Ka'ohulani Mc Guire. Since the completion of the archaeological inventory survey by Cultural Surveys Hawai'i in March, 1999 much of the shrubbery on the Kekupua side of the pond has been cleared. The monkeypod tree and the coconut trees near the pond's edge were still standing. Mr. Kaleohano pointed out the spot where the *pāhaku* is supposed to be, near the water's edge. We were not able to see it because there were so many old palm leaves and coconuts lying on the top. But, he remembered the monkeypod tree and the coconut tree which marks the spot and was able to point it out to me. Of all the non-family members interviewed, Mr. Kaleohano had the most intimate knowledge of the project area. Even though he had not been there in over 15 years, he still had a sharp and accurate memory of the land and the state of things during the time he worked there.

Aletha Ka'ohi: was interviewed at her home in Waimea on April 30, 1999. Mrs. Ka'ohi was born on July 19, 1930. Her mother, Margaret Kamala Kama'i, was of pure Hawaiian ancestry and came from Olokele Valley in the Waimea District. Her father, of part Hawaiian ancestry, was William Goodwin. Mrs. Ka'ohi is related through marriage to Hawila Kaleohano, who is her brother-in-law. Mrs. Ka'ohi is also related to Charles Gay through a *hānai* relationship to her grandmother's first cousin, Fakuahana.

In 1928-29, Wendell Clark Bennett conducted field work on Kaua'i recording archaeological sites. His work, *Archaeology of Kaua'i* was published by the Bernice P. Bishop Museum in 1931. Mr. Goodwin, whom Aletha affectionately refers to as "Papa", was an informant to Bennett, especially for the Waimea and Makaweli districts, and accompanied him on his travels around the island identifying and locating sites. When asked if her father kept a journal to record his stories and knowledge about place names she replied, "No. Over here. Passed it on to over here. [Points to her head indicating whatever he passed on to her is in her memory.] . . . Everything was by memory . . . And how do you remember? I used to repeat and repeat to myself. Dad telling me something. [and] I would say, 'Oh, Papa, I need pencil.' 'No. If you cannot remember, it's not meant for you.' So, many times, I have to go into solitude. I have to have a really quiet, quiet time and then part of it is to recall what might have been said to me. And, you know, it's all in here [pointing to her head]."

Mrs. Ka'ohi is a retired librarian and she was never employed by the Robinson family, nor did she spend a great deal of time at Kapalawai. Her knowledge of the proposed project area comes from spending time with her father and from growing up in the Waimea area. When asked if her parents shared any stories of the project area with her, she replied,

... we didn't do much about Kapalawai. Too private ... My folks never knew. My dad spent more time telling me about Waimea. He said that was more promising. That's what he would say.

When asked about the name of the fish pond, Mrs. Ka'ohi replied, "The fish pond was well known to everybody. This was a big [emphasized] fish pond. And I knew that it was Kekupua because I would walk with my father and go fishing with him. I was his big girl." As to the theory that this pond could be the same pond Captain Cook used to provision his ships with water, she disagrees and says her father never supported this theory because of the water being brackish.

As a little girl, Mrs. Ka'ohi remembers walking along the beach and being able to see the Aubrey Robinson home from the beach. The view from the beach to the house was always kept open. As to fishing along the project area, Mrs. Ka'ohi says, "... few [emphasized] people went fishing along there. Very few people. My dad was one."

Mrs. Ka'ohi didn't have much knowledge of the fish pond. She did see it on occasional visits with her father to Kapalawai and she remembers that it was kept "really clean. It didn't have grass growing wild." She confirms the unusually large size of the mullet in the pond — so large that you "couldn't fit [it] into a refrigerator. You had to curl it up."

As to knowledge of the rock platform, Mrs. Ka'ohi had no knowledge from her father or otherwise. She had never heard any stories about a possible site being located in that area. She reiterated that they mainly accessed the area along the beach and there would have been no need for them to go inland, and onto the Kapalawai property.

When asked about coastal settlements, Aletha related there were fishing houses along the beach, down near the Russian Fort area where her family owned a *kuleana* parcel. This parcel was a *lele*, meaning that the parcel was in two pieces, one piece down on the coast and one piece up *mauka*, in Waimea Valley, where they kept their *lo'i*. About the fishing *ha'e*, she says, "There were lots of them there." She has no recollection of any taro or *lo'i* being located down near the fishing houses on the beach. To her knowledge, there were no Hawaiian settlements along the Kapalawai coastline. The coastal settlements were located outside of the proposed project area, in the direction of the river and fronting the lands known as 'Akia.

Mrs. Ka'ohi did not have any knowledge of *kuleana* in the proposed project area. (Research of the Land Commission Awards indicated there were none.) It was her opinion that any *kuleana* would have been up *mauka*.

Momi Kapahu/Kala Kapahu: The Kapahus are husband and wife and this was a joint interview conducted at the Kapahu residence in Kekaha on April 29, 1999. Their daughter, Joanie was present, as well as, other family members at various times throughout the interview. At the time of the interview, Uncle Kala was 81 years of age and Aunt Momi was nearing her 76th birthday. Mr. Kapahu suggested doing a site visit to help jog his memories of Kapalawai. However, because of his health, it was decided not to do a site visit to Kapalawai, due to accessibility and the amount of walking which would have been involved.

Ashford Kala Kapahu was born August 28, 1918 in Waimea, Kaua'i and has lived on the West side (Makaweli, Waimea, Kekaha) all of his life. He began working as an "ordinary laborer" for the Robinson family in 1930 when he was twelve years old and worked for them for thirty-five years before leaving their employment in 1965. His work included a variety of duties from breaking in horses, gardening, cleaning the fish pond, irrigating the pasture to trimming the *kraue* and bougainvillea around the property.

In 1930, when Mr. Kapahu first began working there, he remembers that the fish pond was clean and not overgrown. "The only thing we had there was the bougainvillea." (These bougainvillea still grace the property today.) He recalls that a picket fence surrounded the fish pond, except for the part where the bougainvillea was overgrown. In his opinion, the fence around the pond kept the "two-legged fish out of there ... They used to go in there throw net, you see." Following is a portion of the interview describing how the fish pond was used during the time he worked there.

KK: It had two gates. See, when the Robinsons started to plant these Irish potatoes, we used to take 'em in there to wash, use the fish pond water to wash the potatoes, the Irish potatoes. 'Cause I used to take care the pond in there. Irrigate the pasture. Yeah, with that water, we used to wash the potatoes.

So, the fish pond water served two purposes, to wash the potatoes and to irrigate the pastures around the main house complex. The pump house at the top of the pond was built during his tenure at Kapalawai. Speaking of the pump house, he says, "I was the one that operated the pump house ... When they started to raise the potatoes is when they built the pump house ... It must have been in the late [19]30's, I think.

By 1930, the existing walls on the property had all been built, but the driveway was still an unpaved dirt road. As for structures on the property, Mr. Kapahu confirmed the existence of the camp houses and the two houses near the fish pond which housed the Rita and the Nunes families. There were also about four *lo'i* near the fish pond for the "ones that take care of the pasture — the old man Kualo and his [two] sons and another old man, Pukaiwa. He usually take care the taro patch." Farther down, nearer a depressed area which sometimes filled up with water, he recalls there was a water tank. And farther still, on the beach was a bath house for Eleanor Robinson.

The *kiawe* and *bougainvillea* on the property was always kept trimmed in those days. Mr. Kapahu recalls climbing up onto a crane so he could trim the *bougainvillea*, it was so tall. From the front of the main house, there was always a clear view down to the beach and this area was kept clear of *kiawe* trees. He also adds, "That time, like when the cowboys used to ride horse, they use to go all over the place. So, in order so they no get hurt riding their horse under the tree, we used to trim all that, all the branches, and make that into firewood."

When asked about the rock platform, Mr. Kapahu referred to it as a "pile" and commented,

KK: The Robinsons used to raise goats in there. Goats and sheep. We used to call 'em the "jackass pen". We used to keep the jack in there.

CSH: Was that area ever fenced in? Was there ever a fence around the platform?

KK: Around, yeah. They used to have fence around. 'Cause where the corn field side is, there's the stone wall. And then the fence used to be on the ocean side, in the pasture. A hog-wire fence.

CSH: And that was mainly to keep the goats confined?

KK: Yeah, from jumping over. See, the goats, they can only stay there for a little while, then they took some up in Hanapepe and turn 'em loose in the forest.

CSH: Have you heard anything about that platform area? Any Hawaiian stories or any stories [about] what it could be before the Robinsons used it for goats?

KK: Oh, no. I don't know nothing about it.

CSH: Do you remember anything about it?

KK: The way I think, maybe, when the Robinsons used to move all the rocks from the field and, then, they pile them up like that.

CSH: So, you never heard anything about it?

KK: No.

Mr. Kapahu did not have any knowledge of any possible *leiaua* being located at Kapalawai.

In discussing the fish pond, Mr. Kapahu confirmed the fresh water springs in the pond and he says,

KK: But, I know there's *lotta* spring in there. 'Cause we used to go in and push that *timu* with a plank.

CSH: And could you actually see where the water was coming up?

KK: No, you can feel. When you dive down, you can feel the difference.

CSH: About how deep was it?

KK: Oh, that days was only about four or five feet maybe — five feet at the deepest, I think.

When asked about fishing in the pond, Mr. Kapahu relates that old man Kualo would go fish in the pond — but only for the Robinson family — and not for himself. According to Mr. Kapahu, the workers who lived at Kapalawai were allowed to fish in the pond for personal use, though it seems that the mullet were off-limits to all.

Miriam Ku'uieimomi Ho'okano Kapahu (the sister of 'Olu Ho'okano, who was also interviewed) is the daughter of Helen Leihulu Spencer and Moses Kauhū Ho'okano. She was born in Kekaha on May 25, 1923, but was raised in Kekupua, up in the ranch [referring to Makaweli Ranch, owned by the Robinson family]. Her father worked as a *paniolo* and they lived in housing provided by the Ranch. Momi, as she likes to be called, relates that both of her grandparents worked for Aubrey and Alika Robinson. Her grandfather, Uahinui Ho'okano, worked as a yard boy and gardener and her grandmother, Mariah Kepoia Paekukui Ho'okano (of Molokai), was a laundry lady and housemaid for Alika Robinson. Mariah's grandfather was from Ni'ihau and Auntie Momi believes this is their connection to the Robinsons and how her family came to be employed by them. Auntie Momi worked as a nursemaid for Alika Robinson for about one and one-half years and took care of her until she passed away. After that she went to work at the Plantation clinic.

Since Mrs. Kapahu worked as nursemaid in the evenings, usually "from seven [p.m.] to seven [a.m.], her knowledge and memories of Kapalawai are mostly confined to the house and caring for Alika Robinson. She recollected the piano and the pool table out on the back porch and the uses for the different rooms in the house and which ones were used by various family members.

Mrs. Kapahu remembers that from the back porch of the main house, "You can see the *mauka* (Makaweli house) house in the evening time [when the reflection from the setting sun shines] on it." She says about the Robinsons,

MK: Mrs. Robinson, the old lady Alika, used to sit down over there every evening and watch *mauka*.

KK: The old man, [Aubrey] Robinson, too.

MK: We used to wheel her out there.

Both the Kapahus remember the large garden that was maintained behind the main house complex — a fruit garden on one side, which was noted for its many varieties of mango and exotic fruits as well, and a vegetable garden on the other side.

CSH: What kine vegetables had them?

KK: Oh, all kine — beets, lettuce, spinach, all kine. The Robinsons, they don't tell you what to plant. You plant what can eat.

Mr. and Mrs. Kapahu had no specific knowledge regarding the name of the springs in the pond or of any legends associated with the pond or for that matter, of any legends related to the Kapalawai project area. Their knowledge of Kapalawai was mainly related to their work experiences in the project area.

Kawika Kapahulehua: the son of Sarah Mamāli'i i Keli'ioa ole and Levi Kaleiki, his birth name was Elia Ku'unohu Kawika Kapahulehua. He was born in Hilo in 1930. Three months later, his parents moved to Nī'ihau to be with family and mainly to be with his grandfather who was rapidly failing in health. They arrived four days too late and by the time they arrived from Hilo, his grandfather had already been buried. Uncle Kawika is a *manaleo* (native speaker of Hawaiian language) and speaks Hawaiian fluently. Mr. Kapahulehua lived on Nī'ihau until he was 13 years of age. His family moved to Pākalā, Kaua'i and he spent the next four years working for the Robinson family doing odd jobs at Kapalawai and wherever else he was needed. At 17 years of age, he relocated to O'ahu where he currently resides. In his spare time, he volunteers as a *kupuna* for the Department of Indo-Pacific Languages at the University of Hawai'i at Mānoa. He also does Hawaiian translation work. He is an experienced sailor and in 1976 he served as the captain of the Hokule'a's maiden voyage to the Pacific. Mr. Kapahulehua is also a cousin to 'Olu Ho'okano and Momi Kapahu, two other informants who were interviewed for this project.

Uncle Kawika's earliest memories of Kapalawai go back to the late 1930's (1937-39), when he remembers staying at the houses near the fish pond with his family. (The houses are no longer standing today.) Whenever his family had a need to go to Kaua'i (i.e., medical appointments), Uncle Kawika would accompany his parents and, usually, they would stay at Kapalawai — either in the houses near the pond or the houses in the "camp area".

Mr. Kapahulehua recalls "discovering" the fish pond when he was about eight or nine years old. His father needed medical care which was not available on Nī'ihau and the family stayed in the houses near the fish pond at Kapalawai. Following is an interview excerpt.

KK: I first found that fishpond looking around. And, I guess the caretaker of the place, "Hey boy!" He was surprised when he spoke to me and he's trying to speak in the Hawaiian language. "ʻĒ e hēle 'oe! Hēle 'oe!" I say, "No ke aha?" He look at me, "I don't speak Hawaiian." So he spoke in English, broken English. He was surprised I answer back in English. I say, "What's wrong? I'm just looking over this place. I'm from that island over there, Nī'ihau." "Oh. You speak English?" "Yes." He said, "Most people don't speak English from that island." I says, "But, I do." "Where you learn English?" "I'm learning at home by myself." "By yourself? You teach yourself?" "Yeah. I teach myself. I hear my mom, dad and uncle all speak English." So he said, "Oh, you visiting from Nī'ihau?" I said, "Yes. I just wanted to see what's going on all around here." He said, "Well, this is all family property from Robinson. And there's the mullet fishpond. I didn't know about another eight years later, I was going to clean up the pond."

CSH: So getting back to that first time when you saw the fishpond, the caretaker let you walk around?

KK: Yeah. Follow him. And he explain what he was doing. Pulling all the dead leave, clean the pond. "Cause otherwise, the fish get sick. I said, "Yeah. There's lotta small fish." He says, "Yeah. And we have to feed 'em because they don't go out to the ocean. As soon as they come in, we put a very small screen to block them from going back out. But the water can go back and forth. Ocean water and fresh water mixes. So they can stay in here". . . I asked him where the water come from. He say, "Right in here there's an underground spring."

CSH: Did he, by chance, tell you if there's a name for the spring?

KK: No.

In those early days, Mr. Kapahulehua relates how exciting it was for him to visit Waimāea and be exposed to things he never saw or experienced on Nī'ihau — eating ice cream at the ice cream parlor, seeing the different makes of cars, the fire station with its shiny red fire trucks and so forth.

It was not until 1943, when Mr. Kapahulehua was 13 years old that he first began working for Aubrey and Aika Robinson at Kapalawai. For a short time, perhaps a month, he lived with his family in one of the camp houses at Kapalawai before moving to a larger house at Pākalā. He remembers that a "Japanese lady lived right down at the end of the road and she come up ask for us to give her all the laundry. She does the laundry and she charge a nickel a piece for each piece of the laundry. She knows we don't have any laundry place to clean up, so she help all the Hawaiian people. Sometime she and her husband bring up a pot of stew, soup, Japanese style.

Mr. Kapahulehua describes his early years working at Kapalawai.

I was unskilled labor. Going with a group of Filipino, Japanese men. Some days, we'd go fix fence. The horses and the cattle just break it up because the bottom of the post is all eaten up by termites. So what the foreman want to do is take the post off, dig the hole, the same hole. I say, "No, wrong!" "Why wrong?" "You dig a hole next to that, not the same hole. 'Cause that hole is already full of termites. So if you dig a hole right next to it, make it little bigger. Then you take another post and dig it right next to that hole, but put your cement on the bottom. And put the post on top, then you put cement all the way around, bring it all the way up, four inches higher than the hole, than the ground." He says, "Why?" "The termites in that hole cannot eat through. They gotta eat cement first."

Another of Mr. Kapahulehua's duties was to tend to Mrs. Sinclair Robinson's gardens, preparing and planting new beds, weeding and watering. One of his other responsibilities was to clean the fish pond. Mr. Kapahulehua devised a way to clean the rubbish from the pond using a rope and a hook. This is how he tells the story:

So, when we got to the fishpond I said, "Bring the hooks and the rope." [The Filipino guy says, "What you going to do with this, my boy?" I said, "I show you what to do." And, we see two guys taking off their shoes, taking off their pants, putting on their shorts. I says, "What, you going go swimming?" "Ah, no. But I must go into water and go get the leavels[.]" I said, "No need. No need go in the water." "Oh, you have a way to get the leavels out of there?" "Yeah. I get way to get the leavels out [of] there." "How?" So I show him the hook. I tie the rope to the hook, swing it, throw it right over, drag it slow, pull it fast. "Oh, this young kid, he smart, no!" So that's how we do it. So we clean all the leaves out of there, even the old ones before that. Because the guy that normally clean that, we don't know what happen to him. He hasn't been around for quite a while. There's a lot of leaves down on the bottom. But we cleaned it very good.

Mr. Kapahulehua had no knowledge of the rock structure and said he had never heard any stories about that area or the rock platform. He surmised that it could be one of two possible things, a "heiau" or a "rock pile" from clearing the cane fields, but, he did not know for certain what it was or if it had a specific function.

When asked about fishing and hunting, Mr. Kapahulehua said, as long as an employee asked permission, they were allowed to do so. However, certain things were off-limits, such as fishing for mullet in the pond, but one could go down to the beach and fish. In his opinion, fishing was still good, but the "imu, over there no good. Dirty. You gotta scrub that. By the time you get through scrubbing, hardly any imu left."

Mr. Kapahulehua explains that even though he worked at Kapalawai for four years, his knowledge was limited because he did not work with Hawaiian people. Mr. Kapahulehua spent a total of four years working for the Robinsons before he moved to Oahu and joined the National Guard.

Ed Rice: is of Caucasian ancestry and moved to the Islands from Montana in 1962 with his wife and two children. Ed Rice is not related to the missionary Rice family who came to Hawaii in 1840 and settled on Kauai in 1854. Ed's training and work experience has been in accounting and the financial end of business operations. Over the years, he has worked for various companies such as C. Brewer, who owned Olokele Sugar Company and leased 7,000 acres from the Robinsons, and Alexander and Baldwin, who owned McBryde Sugar. In October of 1982, Mr. Rice was recruited to work for Gay & Robinson after Selwyn Robinson fell and broke his hip. Though an outsider, Mr. Rice was interviewed at the suggestion of Warren Robinson because of his intimate relationship to the Robinson family and, also, because of his knowledge of the business end of the Robinson operations — Ni'ihau, Makaweli Ranch and the sugar plantation. He was a good friend of Selwyn Robinson and has spent much time going through old documents and paperwork in the family archives from which he has gleaned a keen history of the Robinson family. Much of the interview did not pertain to the actual project area but, rather, was centered around the Gay and Robinson operations and various aspects of the family business.

Mr. Rice and Selwyn Robinson were business associates and became friends while Ed was employed at Olokele Sugar Company. They both ran the financial and administrative portions of their respective companies. Mr. Rice relates how he came to work at Gay & Robinson (G&R).

ER: In 1980 or 1982, he [Selwyn Robinson] fell down and broke his hip. He was 90 years old at the time. He fell down in April and, in June, it became evident to everybody, including Selwyn, that he was not going to be able to return to work. So, he sent Warren down to recruit me from McBryde Sugar Company, which took a number of months. I came to work in October of 1982. Then in 1984, Selwyn died and I was on my own after that.

In Mr. Rice's opinion, the Robinsons were astute entrepreneurs. As each of Aubrey's sons came of age, they were given different responsibilities in the family business. Sinclair oversaw the sugar plantation, Aylmer oversaw business operations, Selwyn ran Makaweli Ranch and Lester managed the farm. The farm experimented in at least a half dozen agricultural endeavors, potatoes and citrus among them, as well as bee-keeping. The most successful endeavor was raising bees for honey.

Mr. Rice believes the lack of a water source in Makaweli would have affected settlement patterns at Kapalawai and the coastal plains areas and he talked about why this might be so.

Well, the history of Makaweli as I know it . . . [which is] what I have been told from various and sundry people even before I was working here . . . is that the ahupua'a of Makaweli had no water, which it didn't, until the Robinsons brought it here in 1905 with the Olokele Ditch . . . then, later in the 60's, I think, they built the Kō'ula Ditch and brought it out of Upper Hanalei Valley. Prior to that, there was no water . . . Having said that, I think that there was no cultivation anywhere on the tableland at all. Possibly in some of the valleys and gulches, but most of them don't have year-round water, so there's a limit to that . . . to go back to your original question of what Kapalawai was used for prior to the Robinsons making the homestead, I don't think it was anything significant . . . I don't think they used it for anything other than pasture land . . . Simply because of the water situation. You couldn't grow anything then.

Information obtained from informants indicated, in the 1930's, the pastures at Kapalawai were being irrigated with water from the fish pond.

When Mr. Rice first came to Hawaii, he recalls that the hothouse behind the main complex area was in good working condition. It is unusual in that it has a dug-out earthen floor about five to six feet deep, with a series of steps that you walk down, like walking into

a basement. Today, the hothouse is dilapidated with the roof fallen in and the floor filled with dried mud. Ed relates that, in 1984, there was a "big flood" which washed out the whole area and left behind about three feet of mud.

About accessing the shoreline to fish, Mr. Rice says, "We let people go, and they fish there . . . It's been my observation (that) most of the fishing that I'm aware of takes place on the Pakala reef . . . Now, we let people go through the corn field [Akia 1] . . . We let people go through there to get down to the beach to fish . . . It's a beach right-of-way down there, so they can certainly traverse and go back and forth. But, I don't remember seeing anybody down there fishing. Or, I haven't heard of anybody down there, right in front of Kapalawai. I don't think that there is anything there. I don't think it's a good fishing spot, myself."

Mr. Rice did not have any information about the rock structure other than that it existed. He surmised that it was a rock mound which was made when the adjacent field was cleared for cane. He further added, "It doesn't look like any *heiau* that I've ever seen or any remnants of a *heiau*. I just thought it was a pile of rocks. I've seen it for years."

Mr. Rice commented that he had worked for at least three other sugar companies and the Robinsons were the only ones who used Hawaiian place names for field designations. "When I came over here, Warren starts throwing all these Hawaiian names at me, which every field here has a Hawaiian name." While the other companies found it easier to assign a number for each field, the Robinsons retained the Hawaiian place name as the prefix and added a numerical suffix to distinguish different fields in the same area, for example, Nonopahu 5, Akia 3.

Warren Robinson/Bruce Robinson: An interview was scheduled with Warren Robinson for May 21, 1999. The interview was conducted at the Kapalawai Offices. Also present, at Warren's request, were his cousin Bruce Robinson and Charlie Okamoto, who handles land management for Gay & Robinson.

Warren Robinson is the son of Selwyn Robinson and the grandson of Aubrey Robinson, who built the Kapalawai house. He is the patriarch of the Robinson family and currently heads the Gay & Robinson Family Partners. He is faced with the many challenges of balancing the old and the new and guiding the family operations into a new era and millennium. He resides in Kekupua Valley, where he grew up and has lived most of his life.

Warren felt he didn't have intimate knowledge about Kapalawai because he was raised up on the ranch in Kekupua. But, his recollections of Kapalawai gave an added perspective that would have been lacking without it. Speaking of his grandparents and Kapalawai, he says:

My grandparents lived here. And as a kid I use to hang around and, when I first started out being a cowboy, we had to deliver milk cows to them. And I used to always come in here to get the cows and take them out when the calves got too old. That's essentially why. And, then every Sunday, we had a

family dinner. The whole family got together and had dinner. And when you're growing up as a little kid, it was very hard to sit in the parlor, and to [just] sit. So, we were everywhere, from the pig pens to the fish pond and, what not, exploring.

Warren grew up in Kekupua Valley and he reminisces about the good times he had growing up there, hanging out with the *pantiolo* families, and learning to be a cowboy, himself.

Growing up in Kekupua was a real winner. You know, in Kekupua was my family — a *Haole* family and there was a Japanese family in there and there was a Hawaiian family. 'Ohu Ho'okano was there. I think there were thirteen of them. Thirteen boys. And then one boy was Japanese. And it was really a great experience because we all played together . . . we used to go and play football. It was really the way to grow up. Just sort of like a closed society in the valley, you know. Just the three families. Like 'Ohu's grandfather — 'Ohu's grandfather was the foreman. And, I believe education should be how he taught it. Because, when you learned to rope, I don't know how many cowboys don't have fingers because they got caught in the pommel, you know, the rope. Couple of times, I didn't do what I should have done. And, we used rawhide ropes in those days. And, he'd just walk up to you, take the end of the rawhide rope, which had eight ends on it, and pound you with it. But, I tell you, you know what? We learned. I never made those same mistakes again 'cause I didn't want to get pounded. I don't mean gently either. He really pounded you. So 'Ohu's dad was my foreman. He taught me how to be a cowboy. 'Ohu and I were, well, 'Ohu was three years older than me.

'Ohu was a good cowboy. He finally learned. But, 'Ohu, when he was fourteen or fifteen years old, you know, wasn't as good a cowboy as when he finally grew up. And, Eddie Tamiguchi. He was one of our cowboys. I always respected him because hard working, yeah? Probably the hardest working man I've ever seen. I really kinda molded myself after him. I wanted to be like Eddie Tamiguchi because he worked so hard. And, I tried real hard to work like how Eddie did. I give him a lot of credit because both his parents died and he raised the family and he did very well. But, he was a good man. And there was 'Ohu's older brother, Kaipō. Essentially, the ranch foreman was Kaipō, Kaipō, Eddie. Most of them, Ho'okano's, except for Eddie. They've been the families that have come down and been our cowboys. Those two families. I think that, probably, the family life here at Kapalawai was probably divided pretty much between Ni'ihau, the Makaweli house and Kapalawai.

Warren's education was interrupted because of World War II. By the time Warren was 13 years of age, he was following in his father's footsteps and working on the ranch, learning to be a cowboy. He speaks of those early years and his educational background:

Well, for the family, this was truly a family farm and this was (emphasized) the farm. And, this is not to be included as the ranch. This was the family farm. Then, the ranch got started up in the mountains. And, they had milk cows, they had a lot of horses and all the pens out there, as you walk behind the house, you know, the remnants, those are all stallion pens. The milk cows, we'd milk the cows up there. We had fruits and vegetables across through here, flowers — a small flower garden there, pigs [and] goats down there, and a fish pond, plus, the ocean where they could catch fish.

Talking about the honey and bee-keeping business, Warren did not recollect when the family started that enterprise, but he remembers that in the 1950's, the Robinsons were producing about 80,000 pounds of honey a year.

... we had hives from Mānā to Hā'ena throughout the whole island. And, our main crop was *kiawe* honey and then the bugs came in and started stinging the *kiawe* flowers. But, for years, it was *kiawe* [honey]. And, on the other side, you get Java plum, and stuff like that, which is a white honey but, it's very bitter. The *kiawe* honey is by far the best honey. So, I guess in the sixties, we got rid of 'em. We sold 'em to somebody else. They took 'em on an airplane and took 'em to the Big Island.

An interesting tidbit Warren gave about the place name Kekupua is that for awhile, it was called the "Moorlands", because "in the winter time, Kekupua was ground fog — like the moors in old England. . . you don't see it now, but in the old days [referring to the 1930's - 1950's], you could see the fog. It'd be all fog in the mornings and it'd dissipate.

Bruce Robinson: is the son of Lester and Helen Robinson. Bruce oversees the Ni'ihau operations and, because of this, he speaks the Hawaiian language fluently. Bruce and Warren are cousins.

Bruce did not say much during the interview, but he did offer what he knew about the fish pond and the springs. Following is a portion of the interview where he discusses the name of the springs, and Hawaiian names in general.

- CSH: Bruce, have you ever heard a name for the fish pond?
- BR: Nods his head [yes].
- CSH: Do you remember what it is?
- BR: The spring. Kekupua is the name of the middle spring. But, there are lots of different names that were used at different times.
- CSH: That's kind of been my hunch.
- BR: Yeah. And, Hawaiian names are very, very era oriented. So, you'll have one group of people — if you had told Kuno's father to go to Kekupua, he'd go straight to the spring. He would not go to the pond 'cuz that name was not used back then. Then, later on, he was using it. They transferred names. So, you will get stories and lots of them, on Ni'ihau. It's really prevalent. You'll get stories and you don't

I was going to [school at] Makaweli annex which is in Kaunakani. And, the war started and the Makaweli annex closed. It was a little chaotic at that time. So I didn't go to school for a year. I worked. When I was thirteen, I started working on the ranch. Prior to that, I'd go out with the cowboys, getting paid two bits a day. Big salary . . . after work, I was tutored by three people. It was a minister tutored me in Latin and some lady tutored me in math, and I can't remember the person who tutored me in English. After *pau hana* time, then I'd go and get tutored in these three subjects . . . after the first year, I was sent to the mainland . . . I went to boarding school in San Rafael. The war was going on at that time. And so at seventeen, you know, I wanted to, in those days everybody was very patriotic. You wanted to serve in the army. You didn't want to hide, draft dodge and go to Canada and all. So I was looking forward to going in the army when I was seventeen. I took school right through, summer and all. So I was able to graduate in two years. So essentially, my high school education was one year of being tutored in three subjects and two years of being at this high school and I got the bare rudiments of a high school education. And, so then, I came back. I was still pretty young, you know. And, so I had a year to go before I could join the Army. So, I worked again for another year. And, by that time, the war was *pau*. So, I continued to work. Then I went to University of California, Berkeley. It was difficult because I didn't really have a good background in education. It was a struggle. I really struggled. And, not only that. But, all the veterans were coming back and they were guys in their mid-20's and all that. The competition was rough. Cal-Berkeley was a big college. They didn't care. You either sank or swam. But, it was up to you. I struggled. I really struggled. It took me five years to get through. And, then, I came back. I went in the army then. After awhile I came back here and I've been here ever since.

Warren graduated with a Bachelor of Arts in Liberal Studies. After returning to Kaula'i, he worked on the ranch and, eventually, learned the family business and took his father's place running Makaweli Ranch. But, he makes it clear that he had to work his way up through the ranks. When he returned from college, he says,

I had nothing to say at that time about the business. I was a peon. I worked as a cowboy first and was a ranch foreman and, then, finally the ranch manager. And, eventually, I ended up as the manager of the ranch and sugar company, President of the company and Chairman of the Board. I started from the bottom and worked my way up. So that's roughly the history of my growing up.

For the Robinson family, Kapulawai was considered the "family farm", with huge vegetable gardens, fruit orchards, cows for milking, and pastures which held horses and cattle. Warren comments on Kapulawai:

realize that they're talking about a different time era, [time] frame.
The names may change.

WR: What was the other one?

BR: I gotta go look in my records.

CSH: So, Kekupua referred to the actual spring and not really the pond? They actually meant the spring? 'Cuz Auntie Aletha said she just always knew it as Kekupua Pond.

BR: And, in that time era, it was Kekupua Pond.

CSH: What about Kahe? Have you ever heard that as a name?

BR: Kahe is a particular portion.

CSH: Which part of it?

BR: The mauka portion.

CSH: This part up here?

BR: Nods his head, yes.

CSH: And, is it related to the spring at the top here? 'Cuz I understand there's a spring here and then there's one or two more.
Right. That's the mauka spring.

BR: Kahe?

BR: Yeah. But, see, that's not really considered part of the main spring. You have Kahe and, then, you have the next one that's got the name of Kekupua and then, Ma'o.

CSH: There's four springs?

BR: Three.

CSH: And, do you know any stories related to the springs or the meanings of the names and why it was given those names?

BR: No.

WR: You know the water study guy? He says there's so much water coming out on this side. I always thought it was this [other] side. I thought it was coming out of this south side or outside because it changes the texture of the ocean.

BR: The fresh water?

WR: So, obviously they're not only from the fish pond, those springs, but there's [other] springs.

BR: There are others, there's something else.

Down near the beach, to the left of the "open view", is a depressed area, which informants referred to as a "pond" which occasionally held water. Warren and Bruce both explain what they know about this area.

CSH: You know in this area down here, there's this view to the beach and just to the left of it there's a marshy depressed area where it looks like it used to be wet before. It's right near the beach. In your time, was there a pond there?

WR: Never. Not in my time. That is a seep, you know. But, also in rough weather, the waves will come in there too. I know that. That's where your dad [speaking to Bruce] planted the tilapia.

CSH: 'Cuz Uncle Hawila called it a pond. He said there was tilapia there. And then he said the tilapia got into this pond [the large inland pond] and ate the *imu*.

WR: Yeah. Well, I know it used to have a lot more water than it does now.

CSH: The [little] pond?

WR: Yeah. But, it wasn't always a pond. You know, sometimes it would dry up and just be a seep, you know. And then, of course when the ocean came in, then it really filled up. I do know that Bruce's dad got some tilapia and threw 'em in there. And, I guess they got washed out into the ocean and went out in the ocean.

CSH: When was that do you think?

WR: Probably in the '50's.

CSH: When the tilapia went in?

BR: Late '50's. Yeah, late '50's.

This information was consistent with what was learned from other informants.

Almost all of the informants related that the *imu* that grew in the fishpond was not a common variety they were used to seeing. Most informants said they had never seen it before. Following is an interview excerpt regarding Bruce and Warren's knowledge of this, seemingly, peculiar type of *imu*.

CSH: Do you know the name of that *imu* in the pond? [speaking to Bruce]
BR: No.

CSH: Uncle Hawila said he's never seen it anywhere else. He said he's only seen it in that pond. He thought it was unusual. He couldn't remember the Hawaiian name.

WR: Funny *imu*, you know. It's completely different. It's probably a fresh water *imu*. But, you don't see it around too much. Maybe that's why. I know, when you throw net, and the mullet, they'll spin when you throw the net out. They're gone, you know. And, they go down in that *imu* and they hide. And, then one by one they come up and they get caught in the net.

CSH: How would you describe it? Can you compare it to another *imu* that we have nowadays?

WR: It looks very similar to the stuff on the beaches, you know, and the *imu* that grows in the fresh water ditches. You know, I never really analyzed it. But, just by looking, I would say it could be that type of *imu* that grows in our ditches.

CSH: And what color is it?

WR: It's a quite a bright green, you know. Not light and not real [emphasis] dark. Somewhere in-between. It catches your eye.

When asked about the meaning of the name Kapalawai and whether the name was related to the *limu* in the pond, Bruce offered the following explanation.

BR: No. That name belongs to that little dish kind of area in the back here. Right by that little dish area in back of the garden that's where the name is actually.

CSH: Kapalawai?

BR: Yeah. 'Cuz the *pala* is a little shallow dish kind of thing that use to hold water. And, my dad and Uncle Aylmer both said that's what that name means.

WR: And, that would be important in those days 'cuz there wasn't much water back in those days.

CSH: Right.

BR: There's a small, little clay area right there. And, it's right in the back here and it goes into the *mauka* part of the garden.

The interviews were a valuable part of the assessment for documenting and providing information about people, land use, boundaries, place names and, also, helped to explain the lack of cultural practices within the project area. This information provides a more complete picture of the history of the project area, both past and present, and documents how the land was utilized during the Robinson tenure. The interviews are also valuable for developing interpretive themes which could be incorporated into the development of the proposed project area.

VI. NATIVE HAWAIIAN SITES AND ACTIVITY AREAS PERTAINING TO THE PROJECT AREA

Burials

The present assessment study was accomplished in conjunction with an archaeological inventory survey of the project area (Zulick *et al.* 1999 [Draft]). During the Archaeological Inventory Survey (*Ibid.*) one human burial, in association with a Hawaiian cultural layer, was documented. The burial is likely to be prehistoric-early historic native Hawaiian. The cultural layer and burial were designated State Site # 50-30-9-792 (Feature A and B, respectively). For recommendations and mitigation treatment, the reader is referred to the Archaeological Inventory Survey (*Ibid.*).

It is well-documented that native Hawaiians often interred their dead in sandy deposits near coastal areas. Based on the large areas of sandy deposits within the proposed project area, it is possible that other burials are present. However, it should be noted that the large areas of sandy deposits are primarily located within a strip of land zoned "Conservation" which will not be developed.

Trails

Research of old maps did not show any marked ancient Hawaiian trails within the project area. The earliest map which depicted the project area was an 1891 "Map of Kaua'i, compiled from Government and private surveys of lands belonging to Gay and Robinson." There were no records of trails leading to the fish pond or to the nearshore areas. In fact, the fish pond is unmarked on many of the early maps. However, this does not infer that trails through the project area were non-existent as it is probable that there were trails leading from the upland areas to the coast where marine resources could be accessed.

Given that Eliza Sinclair purchased the *ahupua'a* of Makaweli in 1865, it is possible that access along any ancient trails which may have run through the project area were cut off and, thus, these trails did not appear on late 19th century maps, much less any Gay and Robinson maps.

Handy and Handy, who did their research in the 1930's, wrote about some Kaua'i trails. They specifically mention the Kukui Trail, the Koai'e Trail and a third trail which begins above Wainulu Stream beyond the Po'omau junction. These three trails are inland (*mauka*) and to the west and outside of the project area. All other Kaua'i trails mentioned pertain to the valleys along the Na Pali coast which is to the far north and outside of the project area.

Heiau and Shrine Sites

When Wendell Bennett conducted field work from 1928-29, he recorded four *heiau* nearby the project area and within Makaweli. In addition to these four *heiau*, there were three other *heiau* identified by Thomas Thrum, in 1907, which Bennett was unable to

locate. These *heiau* may indicate patterns of sacred practices that possibly included the present project area. Thus, these *heiau* are discussed below.

Site 43. Māha'īha'i Heiau, as noted by Thrum (1907:38), was located on the east side of Waimea River and by 1907, it was "completely destroyed". The 1891 Gay & Robinson Map shows the area of Mahaihai being east of the Waimea River and *mauka* of the Russian Fort.

Site 44. A'akukui Heiau, located in Makaweli at east branch of Kekupua valley near junction. Described by Thrum as, "A paved and walled *heiau* in good preservation." (Bennett 1971:111)

Informant, Aletha Ka'ohi, the daughter of William Goodwin (an informant to Wendell Bennett) reiterated she did not know or hear of any specific *heiau* within the proposed project area. She was aware of A'akukui *heiau* in Kekupua Valley.

Informant, 'Olu Ho'okano, confirmed the existence of a "big *heiau*" near where he lived in Kekupua Valley, *mauka* and outside of the proposed project area. Following is a portion of his conversation about the *heiau*.

CSH: Do you know the name of that *heiau*?

OH: No. I only know that's a and that's all . . . it's a big *heiau*. Because I remember when we was small that things used to travel from the *heiau* to the fish pond — to Kapalawai fish pond (he is referring to Kekupua Pond in the project area). The people use to travel at night.

CSH: Oh, the night marchers.

OH: Yeah . . . We were small. Every time we like run go out, my mother used to grab our ear [and say,] "Leave 'em alone!" . . . They chant. From my house, from where they come, they pass in front my house . . .

This "big *heiau*" is likely to be the A'akukui Heiau which Thrum and Bennett both identified.

Site 45. Kaunumelemele Heiau, located in Makaweli on the ridge near the junction of Hikiiei and Kumalele valleys. Described by Thrum as, "An open platform *heiau* in good condition. (Ibid.)

Francis Gay notes that Kaunumelemele (also, Kaunamelemele) was simply called Melemele, which means "small yellow *heiaus*". He further notes that it was a *heiau* above the head of Kahakinaakamahu Valley (Gay 1873:7).

Site 48. Kuwiliwili Heiau

Said to have been located just below Makaweli Camp 3, which site is now in the cane fields. Thrum describes this *heiau* as, "A large, high walled enclosure of *po okanaka* class now destroyed." At the location mentioned there is nothing to indicate a structure but a pile of rocks gathered from a cane field (Bennett 1971:112).

The locations of the above four *heiau* lie outside of the proposed project area.

As mentioned above, Bennett was unable to locate three other *heiau* in Makaweli which had been identified by Thomas Thrum:

Site 8. Pe'eamoa *heiau* in Makaweli. Described by Thrum as "An unvalled *heiau*" (Bennett 1931:152)

Site 9. Kapakaniau *heiau* in Makaweli. Described by Thrum as "A paved, open platform *heiau*; in good condition" (Ibid.).

Site 10. Naullii *heiau* in Makaweli. Described by Thrum as, "An unvalled sacred place; flat ground" (Ibid.).

As for the *mo'o* associated stone in the fish pond identified by Hawila Kaleohano, very little is known about it. It is possible that it could have been used as a shrine for offerings, but there was no evidence to suggest this.

Heiau in Kekupua

Kekupua, identified by Bennett as the location of A'akukui *heiau*, is the name of the land area immediately adjacent and to the east of Kapalawai. Research for the present study indicates that the place name Kekupua may have formerly encompassed portions of the present project area, including the fish pond. Today, Kekupua is most commonly associated with Makaweli Ranch headquarters and most people consider Kekupua to be *mauka* of Kaunuali'i Highway, where the headquarters is located. The limited information that has survived to the present suggests that Kekupua may have been an important locale. A dispute among 19th century *ali'i* involved Kekupua. In 1847, Ahukai, wife of Kaunuali'i, disputed Kekānānō'a's claim (for Kamāmalu) for Makaweli and she filed a claim for "the whole *ahupua'a* of Makaweli, Kāua'i, excepting parts held by valid title by the common people and missionaries." (F.T. vol. 11:232-233)

When Kaunuali'i reigned on Kāua'i, he gave Makaweli to his *kaikauhine*, Kā'iīnāo'a, from Kuwiliwili to its boundary with Waimea. When Kaunuali'i died, Kalaimoku sent Kahala'ia to govern Kāua'i. Kāua'i rebelled against Kahala'ia and Kalaimoku, and when the fighting was over on Kāua'i, Kalaimoku gave Makaweli to Kahala'ia, and Kahala'ia gave Makaweli to me, as it had been occupied by my *makua*s. When Kīna'u died, Kekauluohi returned me

to Kaula'i and /she said/ to the King that Makaweli was for me. No one opposed it until 1846, when Kekuaana'o took Makaweli and some other lands belonging to me. (N.R. vol. 9:4-5)

Supporting testimony from 'Opunui and two other witnesses substantiate Ahukai's claim.

These lands are the old possession of Kaumuahi'i, Claimant's wife from her ancestors, from Ka'eo, the old King. They fell to Kaumuahi'i, who left them to his Sister Kaihinea [and] she to her daughter Ka'u'ukuahi'i, who held them in peace till 1846. When Kaula'i fell to the windward chiefs in [the] time of Kaumuahi'i these lands remained in quiet possession of Ka'u'ukuahi'i's family and in the rebellion of 1824 were not disturbed, nor ever till 1846 when Kekuaana'o took possession of the Ahupua'a of Makaweli, but without consent of Ka'u'ukuahi'i, and has held it ever since against his will. The reasons are, he asked her to give him Kekupua, an 'ili in Makaweli, which she refused, for which he took away Makaweli Ahupua'a. (F.T. vol. 11:232-33)

Further indication of the importance of Kekupua is the possible presence of two additional heiau which both Thurum and Bennett did not locate. These two heiau were documented in a 19th century oral history project conducted by the students of Lahainaluna School on Maui. An interview with Kanakahela by a Lahainaluna student was conducted in Waimea, Kaula'i on August 22, 1886. The interviewer describes Kanakahela and proceeds to record his testimony:

He is well acquainted with Waimea and is an old man who was born when Kaumuahi'i was King of Kaula'i in the days when the kapus were still in force. He was grown up when Kaumuahi'i married Ka'ahumanu. Because of this fact, I knew that he was old and so I questioned him on the old tales of Waimea and nearby places and these are the things he told me . . .

The Heiau of Kekupua

1. A'akukui was a heiau that stood at Kekupua.
2. Kaunulua was another.
3. Kuanahii was another.

These were heiaus in which human sacrifices were offered, but Kuanahii had a tele altar, that is, a high place on which to lay the victims. When the kahuna thought that it was the proper time, then the victims were carried to A'akukui or to Kaunulua. Kapuahi and 'Aimoku were priests who officiated in these heiaus. There were more priests but these were the principal ones. Kaumuahi'i was the chief to whom these heiaus belonged. There are no other places of importance there. (Lahainaluna Students' Compositions, #15)

Kanakahela also says:

I knew two of Kaumuahi'i's high priests, one was Ku'ohu and the other was Kapuahi. He had many other priests but these were the heads of them all and they offered up the human sacrifices. The others obeyed the orders of these two. (Ibid.)

Kanakahela also mentions a secret cave site related to Kekupua named Hakinakamahau:

This cave was used for holding personal property but not the bones of chiefs. No chief was ever laid away in it, but tapas, clothing, and canoes were carried into it. All the property in this cave was burned up after Humehume's battle. Nothing was left. These are the marks whereby it could be located: Kekupua was the place, it is situated in the upland on the hill of Hakiakamahau, on the edge of the precipice. It is only a small promontory attached to the hill above and below it is the precipice.

This secret cave belonged to Kaumuahi'i and Ki'ilau was the man in charge of it. (Ibid.)

In an interview with 'Olu Ho'okano, it was suggested that there might be a connection between A'akukui heiau and Kekupua Pond. Mr. Ho'okano indicated that night marchers often traveled between A'akukui heiau and Kekupua Pond.

Fishing Grounds, Marine Resources and Shoreline Access

In ancient Hawaii, the konoiki of an ahupua'a managed the fisheries for the ali'i nui. Traditionally, the marine resources of an ahupua'a (from the shoreline to the edge of the reef) were shared by the konoiki and the tenants of the ahupua'a. Anything beyond the reef was considered open fishing grounds for all. The tenants were required to reserve part of their catch for the ali'i nui and the konoiki. Often, a particular area or marine species would be kapu (forbidden) to the native tenants and were reserved for the chief. In the ahupua'a of Makaweli, during the time when Kiokio served as the konoiki, the kapu (prohibited) fish was 'o opu (HEN Notes I:1582, BPBM Archives).

In the case of a large loko pu'uone such as Kekupua, these kinds of large ponds were usually reserved for the ali'i and would have been off-limits to the tenants. It appears that Kekupua must have been of some significance to the ali'i. In 1846, Kekuaana'o "took possession of the Ahupua'a of Makaweli, but without the consent of Kuanahii, and has held it ever since against his will. The reasons are, he asked her to give him Kekupua, an 'ili in Makaweli, which she refused, for which he took away Makaweli Ahupua'a" (Foreign Testimony 232-233; Vol. 11). It is likely that the mullet would have been reserved for the ali'i and it would have been a valuable resource for a chief to have control over. The loko pu'uone was one of the reasons the 'ili of Kekupua was probably highly valued by the ali'i.

In regards to the pond, it is apparent that Mrs. Sinclair continued many aspects of the *kapu* system which were in place prior to her arrival, such as the practice of reserving the mullet for personal use and sharing the "catch" with the tenants. As indicated by the interviews, these practices were carried over and continued up into the time of Eleanor Robinson. During the Robinson tenure, Kekupua Pond was known for the unusually large-sized mullet it produced.

Kanakabeleā mentions two *ko'a* or "fishing grounds for letting down ropes". One relates to Kekupua within Makaweli. The other, though it is not certain, may be the same Ka 'iio pā 'ia which is located in Makaweli. Descriptions of both fishing *ko'a* are given below.

Hiki is another fishing ground. Fueohulunui is in Mahinauli. It is a promontory on the upland side of Kikihale. When it appears to be above the ditch of Kekupua and a sand mound appears to be close by (that is one landmark). When the black stone in Mahinauli appears above Pu'u Ale'ale'a, that marks the position of the canoe. There are many more fishing grounds but their landmarks cannot be clearly defined. (Ibid.)

Hinaia is another fishing ground. When the point (or brow) of Kiki a 'Oia appears above the black hill of Kailiopaia that is the lower mark. There is a black rock on Mahinauli when it looks as though it had been lifted and placed on Pākālā a rocky point on the shore, that marks the position of the canoe. (Ibid.)

On the 1891 Gay and Robinson map, the place name of 'Kailiopaia' is marked within the *ʻiʻi* of Kapalawai. In Francis Gay's ledger notes on Makaweli place names, he translates Ka 'iio pā 'ia as *the fenced in dog*. He records that "it is a pond which was named for a supernatural dog" (Bishop Museum Archives 1873). It is interesting to note that the literal meaning of Kekupua is:

Demigod or culture hero, especially a supernatural being possessing several forms (as Kama-pua'a and Laenihā); one possessing *mana*; to possess *kupua* (magic) powers. (Pukui & Elbert 1986:186)

It is not certain where this particular Ka 'iio pā 'ia is located or if it is the same as the one noted on the 1891 Gay and Robinson map. Interviews with people in the community did not give any indication of a fish pond in the area marked on the map. No one had any recollection of the name, "Ka 'iio pā 'ia", or of any legendary stories related to a supernatural dog.

Several of the interviewees talked about fishing along the Kapalawai coastline. *Moi* (Threadfish (*Polydactylus seriffis*)) seems to be the most commonly mentioned fish caught in the area. One fisherman indicated that, besides *moi*, there is also *'ōio* (Ladyfish, bonefish (*Abulo Vulpes*)) and *pāpio* (young *ulua*) and also a seaweed he called "ambalan". He indicated that the better fishing and seaweeds (*ko'hu* and *ogo*) are to be found on the Pākālā

side of Makaweli Landing, just outside of the project area (Toshio Ikeda, Pers. Comm.) The general consensus was that marine resources (fish and *limu*) were not particularly good along Kapalawai due to the terrigenous sediments in the water.

On picking *limu* at Kapalawai, Aletha Ka'ohi says, "I don't remember my folks picking there. They'd come out to Pākālā and get their *limu*." Most everyone indicated, if they went fishing along there, they would fish and pick *limu* at Pākālā or down past 'Ākia, nearer the Russian Fort portion of the coastline.

Aletha Ka'ohi remembers that when she was a young girl the "... Robinsons had fences all the way down to the water so you couldn't pass.... And their thing was the cattle but, no, it was to keep people out." When asked about this, Warren Robinson responded,

"No, we allow people to go in there and fish. We let 'em go down by the Russian Fort... They walk along the beach... The only fence I know is the one that kept the bulls and the cattle from interacting along there... During the war now, there was barbed wire along the beach completely. The army put barbed wire right around this island. I don't know when that would be. When she was kinda a little kid. Maybe that's what she saw.

In regard to access issues, it seems clear that in the past, if you were employed by the Robinsons, access to the shoreline for fishing and the *mauka* areas for hunting and gathering was allowed as long as one asked permission. The one exception was the mullet in Kekupua Pond which was reserved for family use. It is not clear if this standard applied to the community-at-large. There are those who felt, that for whatever reasons, they were not free to access the Kapalawai shoreline. Certainly, the previous generations of Robinsons had a different attitude about access and dealt with it differently. Bruce Robinson acknowledged that, perhaps in times past, older Robinson generations did try to restrict access along the shoreline. However, this is not true today. The present generation of Robinsons have made an attempt to work with the community by allowing shoreline access from either Pākālā or the Russian Fort side of the property. This was confirmed through the interviews conducted and by community members. While working in the project area, people were seen strolling along the beach or sun bathing and a few fishermen were pole fishing. Based on proposed plans, shoreline access will be improved by providing additional access areas and public parking from within the proposed resort (DEIS 10/99:1-19).

Native Hunting

During fieldwork for this assessment study, pig tracks were observed in the garden area behind the main house complex; however, it was obvious that pigs were coming down from across the highway to forage for food and fallen fruit from the trees in the garden area behind the garage. A literature search did not reveal any evidence that native hunting practices were carried out in the area and there is no reason to believe that the area provided good hunting grounds. The majority of the project area has been grubbed and used as pasture for cattle and horses for over 100 years.

Large Rock Platform

During the course of the archaeological inventory survey of the present project area (Zulick *et al.* 1999 [Draft]) a large oval platform measuring 48.5 m (155 ft.) by 23 m (73.5 ft.) was recorded in the northwest portion of the project area. No reference to the structure could be located in previous archaeological studies. However, as mentioned earlier in this report, Wendell Bennett (1931:152) was not able to locate three *heiau* previously listed by Thomas Thurum in 1907. The function of the platform is listed as "unknown" in the inventory survey. The lack of any recovered midden, charcoal or artifacts made defining its age and function a problem.

Whenever a construction of this size is recorded, questions arise as to its nature and significance. During the course of this present assessment, an attempt was made to obtain testimonies from individuals familiar with the property who may have knowledge of the platform. The two individuals (Hawila Kaleohano and Kalā Kapahu) who had specific information about the platform both stated that it was a clearing pile for the fields in Ākia which is adjacent to the platform. Following is an excerpt from an interview with Hawila Kaleohano in which he relates his knowledge of the large rock platform:

HK: The archaeology people thought was a *heiau*. But, actually it's not.

CSH: What do you know about it?

HK: That's the rock from Ākia 1.

CSH: What is Ākia 1?

HK: That's the cane, you know where the corn is right now?

CSH: Yeah.

HK: That's Ākia 1 right there.

CSH: Oh, that's where they plowed that whole field.

HK: The whole place. Yeah. That place had nothing but rock. So they went clean that place up, the rock, and they went take the rock and pile it over there on the railroad track.

CSH: What railroad track?

HK: They used to get, you know, in the old days, never had truck before. They used to pull with the tractor. The Robinsons use to get railroad track. So that's how they use to pile 'em over there, the pile off stone. When they tell me the archaeology went over there and put ribbon over there 'cause *heiau*, that's not no *heiau*! That's all the stone from there. When they went clean that place up, right after that, the war went break out in 1941. So they had only cattle in there. Then they stop. After the war, then they plant cane inside their place.

CSH: In Ākia?

HK: Ākia 1. That's where all the stone came from.

Mr. Kaleohano's statement was further corroborated by Bruce Robinson (Pers. Comm. 5/21/99). When clearing the cane fields of rocks, it was a common practice to move the rocks to one area and neatly stack them into cairns or mounds (Ed Rice Interview:5/19/99).

As brought out in the Archaeological Inventory Survey (Zulick, *et al.*, 1999 [Draft]) the presence of "curious" sub-features of the rock platform (a paved depression and a well-constructed pit), as well as the large size, which would have required considerable time and effort to construct and pave the entire surface, provide reasonable doubt as to the function of this site. For these reasons, the site is being recommended for preservation (*Ibid.*).

Prehistoric Fishpond

State Site #50-30-9-765, known as Kekupua Fishpond and documented in *Māhele* records, was the only historic property found to which a tradition was associated. An oral interview with Hawila Kaleohano relates a *mo'o* legend and a particular *pōhaku* near the pond's edge where the *mo'o* would reveal herself. The actual *pōhaku* could not be seen due to fallen debris and overgrowth of the pond, but it seems likely that the stone still remains just under the water near the edge of the pond.

Traditionally, *mo'o* are associated with fish ponds, springs and water resource areas which they guard and protect. They are known to take on more than one form (*kino lau*), many times taking on the form of a part-human or human. These guardian *mo'o* are not the small house lizards we commonly see today. *Mo'o* could take on terrifying forms, and perhaps were more dragon-like than anything else. Samuel Kamakau describes *mo'o* as having "extremely long and terrifying bodies" (1964:83). Often, large ponds were associated with a particular named *mo'o*, who was worshipped and to whom offerings were made.

The presence of a *mo'o* in a pond ensured that fish would be abundant and that the health and productivity of the pond, as well as the welfare of the people making the offerings, would be maintained. Some *mo'o* were known to protect the welfare of the people when they were mistreated by overbearing landlords and chiefs. Retaliation was achieved by withdrawing the abundant supply of fish. There are many Hawaiian legends about *mo'o*. Some famous *mo'o* in Hawaiian culture are Hauwahine of Kawaiū and Ka'eleputa ponds, Kihawahine of Maui, Kanekua'ana of 'Ewa and Laniwahine of 'Ukō'a in Waialua, just to mention a few.

Often, *mo'o* would reveal themselves in the form of beautiful human beings. Sometimes this appearance foretold a catastrophic event (*Ibid.*). Or, sometimes, the *mo'o* would use their beautiful transfigured forms to lure humans into their watery underworld where they, too, would be transformed into *mo'o*.

VII. SUMMARY

Native Hawaiians traditionally accessed the coastal areas for gathering and subsistence and for trade. Though there is no record of coastal trails and no LCA record of native tenant *kūleana* parcels within the proposed project area of Kapalawai, it is likely that native Hawaiians did practice traditional gathering and use rights in the project area and the off-shore waters prior to Eliza Sinclair's acquisition of the *ahupua'a* of Kapalawai. An 1857 lease between the guardians of Victoria Kamāmalu and a group of 120 people from Makaweli and Waimea indicate that the *kapu* (protected/tabooed) items exempted from the lease were the orange trees at Waikes, the large trees of Māhā'ihā'i, the fort, the Pō'alima taro fields, the small and large ponds in Kekupua, the *kapu* fish (*o'opu*), and firewood — if it was for sale for personal and monetary gain. Thus, for example, firewood for personal use could be gathered, along with any other traditional resource items not mentioned, such as *pili* grass for thatching, *hau* for cordage, plants for medicinal use, and marine resources in the off-shore waters. It is likely that any existing resources were utilized unless a specific *kapu* was placed on a particular item, as mentioned above. It is clear from the historic records that Kekupua Fishpond was reserved for the chiefs and, thus, the mullet would have been *kapu* to the native tenants. When Eliza Sinclair acquired Makaweli *Ahupua'a*, she became, in a sense, a "chief" in that she controlled the whole *ahupua'a* and its resources, which would have included the fishpond. It is evident that she continued the practice of reserving the mullet for personal use and kept the pond resources *kapu* to the native tenants. It is also likely that other *kapu* which were in place at the time of her arrival were also retained. Some of these practices were carried over into the Robinson tenure. Thus, even though there were many changes occurring in the overall social and economic structure of Hawaiian society following the *Māhele*, there was a continuity of the *kapu* system as it existed in 1865 when Eliza Sinclair purchased the *ahupua'a* of Makaweli.

Research and oral interviews identified one historic property associated with two cultural traditions — the legend of a *mo'o* and a rock near the pond's edge where the *mo'o wahine* sits and can be seen and the *hauka'i pō* or night marchers. Very little is known about this particular *mo'o* who resides at Kekupua Pond. The pond is significant in that it houses the home and watery realm of the *mo'o*. Traditionally, *mo'o* were revered and worshiped and shrines on which to lay offerings were constructed. The presence of a *mo'o* in a pond contributes to the productivity of the pond, as well as, to the health and welfare of the people. Though the stone cannot be seen due to fallen debris, it is likely that the stone exists and is still there. As stated in the Archaeological Inventory Survey (Zulick, et al., [Draft]), "Any restoration efforts will be accomplished in consultation with the State Historic Preservation Division" (1999:125). It is recommended that prior to commencing restoration work on the pond, Hawila Kalteohano be contacted to identify the exact location of the stone. The recommendation is that the stone be preserved in place.

Another cultural tradition related to the significance of the fish pond is the *hauka'i pō* or the tradition of the night marchers. In the Hawaiian tradition, night marchers are the souls of those who have passed on and are no longer here in physical body. On certain nights (the nights of the gods, Kū, Akua, Lono, Kane and Kāloa), the procession of ghosts

can be seen and heard as they travel to familiar places they once frequented while here on this earth. "They used to march and play games practically on the same ground as in life. Hence each island and each district had its own parade and playground along which the dead would march and at which they would assemble" (Beckwith 1978:200). Sometimes the sound of drums and chanting can be heard, their *kūku* torches seen, and the sounds of laughter and talking heard. It is said that the *hauka'i pō* usually takes place after the sun sets and ends before dawn breaks. "Ohu Ho'okano mentioned that, as a young boy, he often heard the sound of drums and noisy din of the night marchers as they "travel from the *heiau* to the fish pond — to Kapalawai fish pond" (also known as Kekupua Fishpond). Mr. Ho'okano was the only informant who had any knowledge about this tradition in relation to Kekupua Fishpond. Little is known about the actual path itself, except that the night marchers travel a path which passes A'akukui Heiau, goes to Kekupua Fishpond and returns *mauka* where they started from.

The issue of access to the shoreline is a non-issue as there are currently two public access routes adjacent to the east and west boundaries of the project area. The community is free to utilize these access routes and walk along the shoreline from Pākālā all the way to the Waimea River. In addition to this, the present project plans include commitments to improve shoreline access by providing access routes from designated public parking areas from within the proposed development.

Investigations for the present assessment study have failed to turn up evidence of traditional customs and practices presently being exercised in the 170-acre parcel known as Kapalawai. This reflects the geographic location of the parcel, as well as the nature of the land tenure. The project area is located on the flat pasture lands of Makaweli near the coast. There is no abundant source of surface water other than Kekupua Fishpond, which is fed by three underground springs. The *ahupua'a* of Makaweli has always belonged to the *ai'i*; and it is very likely that this particular fish pond was reserved solely for their use and it would not have been accessible to the *maka'ānana* or common people. A document search did not disclose any *kūleana* (native tenant) claims within the project area, though this does not mean that native Hawaiians were not living in the area. The oral interviews, which were a part of this assessment, did not indicate there were any Hawaiian settlements within the project area. The general consensus among the informants interviewed was that known settlements tended to be closer to the Russian Fort and Waimea where there were more abundant sources of water and food resources. Archaeological evidence and research of Hawaiian trails within the *ahupua'a* support the settlement of a larger coastal and inland population concentrated near the seaward portion of the Waimea-Makaweli-Mokuone river valleys. The historic record reflects very little Hawaiian activity at Kapalawai other than use of the fish pond.

The Sinclair-Robinson family has owned the *ahupua'a* of Makaweli, which includes Kapalawai, since 1865. Because Kapalawai was utilized by the family as a ranch, farm and dairy, and because the family preferred complete privacy regarding all of their lands, it was not possible for outsiders to go onto the property unless they had been invited or had received permission to do so. Thus, if any traditional customs and practices had been carried out at Kapalawai prior to the family's arrival, these were most likely discontinued

during the 135 years of the family's ownership. Anyone who might have been pursuing these customs and practices have long since passed away. During the oral history phase of this assessment none of the interviewees could recall being told by Kualo or their elders of any cultural practices occurring in the project area. As a result of the above, it is not likely that Hawaiian traditional customs and practices will be affected by the proposed development.

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APPENDIX A: History of the Sinclair-Gay-Robinson Family

The matriarch and pillar of the Sinclair family was Elizabeth (Eliza) McHutchison Sinclair, born April 26, 1800 in Glasgow, Scotland. Eliza, as she was called, hailed from an influential Scottish family. At the age of 18 she accompanied her father on a business trip where she had the good fortune to meet Francis Sinclair, a captain in the Royal Navy. About one year later, in 1819, they were married. Captain Sinclair resigned from his post in the Navy and took a position at the Inland Revenue Office in Edinburgh, the city of his birth. Here at Edinburgh, all six of their children were all born.

Eliza was ambitious and wanted to provide a firm inheritance for her children. It just so happened that the Royal Navy was offering generous portions of land to retired officers in the newly developing colony of New Zealand. Eliza must have been a very self-reliant and progressive woman for her time to embark on such an adventure at her age (39 years) and with six children, no less — the youngest being seven months old. So in October of 1839, the family bade farewell to their native Scotland bound for adventure and a new life in New Zealand.

Upon arriving in New Zealand in 1841, the family learned they were unable to settle on their lands due to disputes with the native Maori, so they settled temporarily in Wellington instead. During this time, Captain Sinclair built a ship from hand-hewn logs and traveled up and down the coast trading along the way. In 1843, the family settled in Pigeon Bay at Craigforth, the home Captain Sinclair and his sons had built. The family was very resourceful and were pioneers in the truest sense of the word. They raised cattle and sheep and the "men" of the family became adept at boat building.

In 1846, a tragedy occurred. Captain Sinclair, along with his oldest son, George, and daughter Jane's fiancé, Alfred Wallace, sailed to Wellington for supplies. With him, he had taken the family earnings and the year's harvest. The ship and its passengers were lost at sea and were never recovered. Eliza Sinclair was left on her own with little money to support her remaining five children in a rugged and far-off land.

Eliza Sinclair must have been a resourceful and strong woman to survive the tragedy in her life. She had a level head on her shoulders and in time was able to turn things around and prosper again. In 1848, daughter Jean married Captain Thomas Gay, a whaling captain. In 1850, another daughter, Helen, married Charles B. Robinson, a prominent gentleman who lived fifteen miles away in Akaroa. Two years later, Helen left her husband Charles Robinson never to return again. She and son, Aubrey, returned to Craigforth to live with the rest of the family.

Seeking excitement and new adventure, the family decided to set sail for British Columbia or California in search of new land and a change in lifestyle. It was convenient that Jean's husband, Thomas Gay could sail a ship. Along with the family's personal possessions, the 'Bessie' was well-supplied with food, livestock, and everything needed to

start up a new home again on a new frontier. In April of 1863, the Sinclair-Robinson-Gay families said good-bye to their New Zealand home for good. Eliza Sinclair was 63 years old at the time.

It is not clear whether the 'Beesie' stopped in Honolulu enroute to Victoria on Vancouver Island. At any rate, British Columbia did not suit the families' plans, so upon a suggestion from a family acquaintance, they set sail for the Pacific and Hawaii.

The 'Beesie' arrived in Honolulu on September 17, 1863. The Sinclair's immediately began looking for large tracts of land to purchase. Disappointed with what they saw, the family decided to head for California in search of better prospects. King Kamehameha IV, hearing of their plans to leave, offered them the island of Ni'ihau. Unusually heavy rainfall was recorded for 1861-63 and Ni'ihau was exceptionally lush and green when the two Sinclair brothers, Francis and James, did a site inspection of the island. Excited at their discovery, they hoped to re-establish the cattle and sheep business they had left behind in New Zealand. The two brothers accepted the King's offer and purchased the island of Ni'ihau for \$10,000 in gold.

Supposedly, the King was happy to sell Ni'ihau because it had become a financial burden for him. In the middle of the business negotiations, Kamehameha IV died and Lot Kamehameha V became the next king. This explains why Kamehameha V's name (rather than Kamehameha IV) is on the land documents.

In 1865, Eliza Sinclair purchased the *ahupua'a* of Makaweli (21,844 ac.) from Victoria Kamāmalu Ka'ahumanu for \$15,000. A new home was built in the cool uplands of Makaweli and sometime in the early 1870's the Sinclair family moved from Ni'ihau to settle there. This home, situated at about 1800 ft. elevation became known as the 'Makaweli house' that is mentioned in so many of the early journals of visitors to Kaua'i.

The Kapalawai house was built by Aubrey Robinson for his wife Alice Gay Robinson. The exact date of construction is not known, but the house was probably built around the mid-1890's. There was no date on the original house plans, but the Robinsons have a photo of the house with the date 1897 written on the back (Ed Rice 5/19/99:pers. comm.). The house is approximately 22,000 sq. ft. and has 45 rooms. There are 13 bedrooms and 13 bathrooms (Kaua'i Historical Society, General Subject Files: Kapalawai).

Speaking of the family's use of Kapalawai, Bruce Robinson says:

Well, for the family, this was truly a family farm . . . this is not to be included as the ranch . . . the ranch got started up in the mountains . . . they had milk cows, they had lots of horses . . . We had fruits and vegetables . . . flowers, . . . pigs, goats . . . and a fish pond, plus the ocean where they could catch fish . . . (Interview 5/21/99)

Warren's memories of Kapalawai include:

So the children would come every Sunday for dinner. And after dinner, we'd usually sing hymns and my grandmother would read from the prayer book . . . I was more connected with getting into mischief as a kid than anything else. You know, running all over, playing tag. Can you imagine growing up in that house? . . . it was a super place to play in as a kid. (Ibid)

The Sinclairs began ranching in Hawaii when they bought the island of Ni'ihau in 1865. There they raised Merino sheep and Shorthorn cattle from the continental United States, Australia and New Zealand. Aubrey Robinson was the first to bring purebred Arabian horses to Hawaii in 1884 and he maintained stables at Kapalawai. He imported game birds (pheasant and quail) as well as trout and bass which were placed in Waimea and Makaweli streams.

In 1889, Francis Gay and Aubrey Robinson formed the family partnership known today as Gay and Robinson (G&R). Through this partnership, the various family businesses, i.e., Makaweli Ranch and Makaweli Plantation were managed. By the early 1890's the Robinson's got involved in the sugar business not only by planting their own crops, but also by leasing large tracts of land to Hawaiian Sugar Company. The Robinsons were always looking for new and creative ways to utilize their land. For many years, they raised bees for honey and experimented with other agricultural crops.

The Robinson Family Partners is a separate business entity which represents the land owners of the family lands. This partnership was set up to protect the lands and ensure that all lands stay within the family, as well as to preserve these lands for future generations of Robinsons. Today, Warren Robinson, son of Selwyn Robinson and grandson of Aubrey Robinson, is the family patriarch and President of the Board.

In speaking of the Robinson legacy, Ed Rice, retired CEO for the Robinsons, talks about the Robinson work ethic and their attitude about the land,

. . . it was a love of the work and the land that drives these guys. It's what drives that young man who just drove away (Alan Robinson), and his father, and his father's father! In a bigger sense, and this has to do with what the Robinson empire means to the family, it was a way to husband the land. You didn't walk away and leave it with no usefulness . . . even if it cost you money, you put it to some kind of constructive use. That's what ranching is. (Interview 5/18/99)

The Sinclair-Gay-Robinson family heritage is rich in history. Their pioneering spirit is still evident in their determination to preserve the past and the legacy that Eliza Sinclair started.

APPENDIX B: Ahupua'a Boundaries for Makaweli

Taken from the Interior Department Records, Land Numbered Docs 331-340, Doc. 336*,
*found in papers of John Dominis; on file at the Hawai'i State archives.

Makaweli

Commencing upon the sea, at the mouth of the Waimea River and upon its easterly bank, running from thence N. 25° E. 3 chains, along the easterly bank of said river, thence 50° E. 15 chains up the easterly bank of said river, thence N. 33° E. 17 chains up the easterly bank of said river, thence N. 22° E. 9 20/100 chains up the easterly bank of said river, thence N. 10° E. 19 chains up the easterly bank of said river, thence N. 31° E. 34 chains up easterly bank of said river, thence N. 1° W. 6 80/100 chains crossing the mouth of Makaweli River, to the easterly bank of Waimea River, thence N. 24° W. 26 chains up easterly bank of Waimea River, thence N. 2° E. 9 chains up easterly bank of Waimea River to a stake, thence N. 85° 20' E. 16 80/100 chains, passing between the ilis of land called Palaw and Puulima, to a rock standing upon the edge of the pali bounding the valley of Waimea on the East, thence N. 60° E. 20 chains to a rock near the edge of the pali, bounding the valley of Makaweli on the West, being bounded by the land called Waimea belonging to His Majesty the King, thence N. 30° W. 16 chains to a Cactus bush, upon the top of the pali facing the sea, and about midway between the valleys of Waimea and Makaweli, thence N. 6° 45' E. 15 chains, to the top of the Hill called Nahaleokoo to a certain Cactus bush, bounded by the land called Waimea, thence N. 17° 45' E. 150 chains to the top of the Mountain Peak called Kalehuahakihaki, bounded by the land called Waimea, thence S. 50° E. 40 chains along the top of a Mountain range to the top of the peak called Naulili, thence N. 15° E. 65 chains along outain Range to top of peak called Kahana, which forms a part of the Mountain Range which bounds the Valley of Makaweli on the West, thence N. 65° E. 330 chains following the Mountain Range on the West of Makaweli Valley to the Westerly side of the range called Waialeale, thence S. 16° E. 128 chains passing along the Westerly side of said Range of Hills called Waialeale, thence S. 25° W. 258 chains, following the Mountain Range of Hills which bound the valley of Hanapepe on the West, to the peak called Nahaakahenalu, thence S. 16° E. 10 chains along the top of the range of Hills on the Westerly side of Hanapepe Valley, bounded by land called Hanapepe, belonging to His Majesty the King, thence S. 20° E. 40 chains, along said range of Hills, thence S. 6° E. 9 chains along said range to a stake thence S. 24° W. 22 chains to the top of the peak called Ahualahu, thence S. 38° W. 267 chains passing down the side of said Hill and crossing the plains to two flat stones standing opposite each other upon the Road farthest (sic) Makai leading from Hanapepe to Waimea, bounded by land called Hanapepe, thence S. 35° W. 29 chains, passing over the top of the Hill called Kawilili to a monument of stones upon the sea, bounded by the land called Hanapepe, from thence following the sea to point of commencement.

Comprising an area of 21,844 Acres.

*[Note: The above boundaries for Makaweli are the same as those given in Royal Patent 4476 (LCA 7713) to Victoria Kamamalu Ka'ahumanu]

APPENDIX C: Ōlelo Nō'eau Associated with Makaweli

O.N. #1097: *Ho'olele ka uila o Makaweli* (Sending the lightning of Makaweli flying.)
A play on *maka-ueli* (terrifying eyes), this saying refers to the sending of a god on an errand of destruction.

O.N. #1662: *Ka wai'ula 'iiahi o Waimea*. (The red sandalwood water of Waimea.)
This expression is sometimes used in old chants of Waimea, Kaula. After a storm Waimea Stream is said to run red. Where it meets Makaweli Stream to form Waimea River, the water is sometimes red on one side and clear on the other. The red side is called *wai'ula 'iiahi*.

O.N. #2910: *Wai'āhi o Mānā*. (The single water of Mānā.)
When schools of *ʻopelu* and *kaʻakawa* appeared at Mānā, Kaula, news soon reached other places like Makaweli, Waimea, Kekaha, and Pōki. The uplanders hurried to the canoe landing at Keapuka with loads of *poi* and other upland products to exchange for fish. After the trading was furnished, the fishermen placed their unmixed *poi* in a large container and poured in enough water to mix a whole batch at once. It didn't matter if the mass was somewhat lumpy, for the delicious taste of fresh fish and the hunger of the men made the *poi* vanish. This single pouring of water for the mixing of *poi* led to the expression, "*Wai'āhi o Mānā*."



H

TRAFFIC IMPACT
ASSESSMENT
WILBUR SMITH ASSOCIATES

**KAPALAWAI RESORT
TRAFFIC IMPACT STUDY**

Prepared for
HELBER HASTERT & FEE

Prepared by



March 1999

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**Chapter 1
INTRODUCTION**

The Kapalawai Resort project site is located on the southwest portion of Kauai, just over one-half mile east of the town of Waimoa. The 170-acre site includes the former Robinson Family residence and the lands to the southeast of the residence along the makai side of the Kaunualii Highway. The Kapalawai Resort would extend eastward from the present driveway at the Robinson Family residence to the Aakui Stream, a distance of about 4,500 feet. (See Figure 1-1.)

The Kapalawai Resort will include approximately 250 guest units, developed as stand-alone and duplex-type units. The resort will also include dining, swimming pools, tennis courts, and other amenities for its guests. Portions of the former Robinson Family residence and related structures will be retained as a museum intended to preserve the history of this portion of Kauai.

Access to the Kapalawai Resort will be provided by two one-way driveway connections to Kaunualii Highway. The existing paved driveway to the Robinson Family residence will serve as the entrance driveway. The exit driveway will intersect Kaunualii Highway at the location of the existing driveway to plantation homes, located about 480 feet east of the entrance driveway. (See Figure 1-2.)

The purpose of this study is to assess the traffic impacts of the planned Kapalawai Resort project on the nearby portions of Kaunualii Highway. The Project assessment addresses the following:

1. The number of trips generated by the facility.
2. The magnitude of the traffic increases on Kaunualii Highway near the Project.
3. Traffic conditions at the intersection of the Project driveway connections with Kaunualii Highway.
4. Project impacts upon traffic conditions at the key intersections near the Project.
5. Identification of any actions that may be appropriate to mitigate Project traffic impacts.

The traffic assessment focuses on conditions during the morning and afternoon peak traffic hours of a weekday and a Saturday. The assessment reflects conditions in year 2002, the year in which the Project is planned for full operation.

Chapter 2 EXISTING CONDITIONS

The Kapalawai Resort is planned for a 170-acre site along the makai side of Kaunualii Highway, with the site extending from the highway to the shoreline. The former Robinson Family residence and several plantation houses, currently occupied, are located in the northwest portion of the site. The remainder of the site is used for livestock grazing.

Waimea Town is located on the west side of Waimea Stream, just over one-half mile northwest of the site, with Kaunualii Highway providing access to and through the Town. Most of the commercial uses in Waimea Town are located along Kaunualii Highway or Waimea Road, the street mauka (north) of and parallel to Kaunualii Highway. Residential areas are located both mauka (north) and makai (south) of Kaunualii Highway. Access to the Waimea Canyon and Kokee areas are located west of Waimea Town.

The area between the Project site and Waimea Town is primarily occupied by agricultural lands. The Fort Elizabeth historic site is located on the makai side of Kaunualii Highway on the east bank of Waimea Stream. Pioneer Hi-Bred is currently constructing an agricultural research and processing facility along the mauka side of Kaunualii Highway, about midway between the Project site and Waimea Stream.

The area to the east of the Project site is occupied by agricultural lands. Several small villages are located on either side of Kaunualii Highway, with the closest being the Pakala Village and Post Office, located approximately one mile east of the site. The Kaunakani Mill is located about 2.5 miles east of the Project site, with the Kaunakani Village located east of the Mill.

EXISTING ROADWAY SYSTEM

Kaunualii Highway is the major roadway serving the areas in the vicinity of the Project site. This roadway and the key cross streets in the area are discussed in the following paragraphs. The numbers of lanes and type of intersection controls at the key intersections included within the study assessment are depicted in Figure 2-1.

- **Kaunualii Highway** - This two-lane State highway is the major roadway providing access to the south and southwest areas of Kauai from Lihue westward to the Pacific Missile Range (Barking Sands) installation. This roadway passes through Waimea Town and most of the commercial uses have developed on the properties located adjacent to the roadway. The intersections with all cross streets in Waimea Town and other roadways in the vicinity of the Project site are controlled by STOP signs on the cross street approaches. The highway segment adjacent to the Project site is rural in character with a posted speed limit of 50 mph in both directions. The posted speed limit in Waimea Town is 25 mph. Parallel parking is permitted along both sides of the roadway within Waimea Town. The section east of the site has a posted speed limit of 50 mph with speed

reductions to 35 mph at the key intersections with the Pakala Village Road and the Kaunakani Mill Road.

- **Ala Wai Road, Waimea Town** - This two-lane street intersects Kaunualii Highway at the west end of the Waimea Stream bridge, and is the intersection closest to the Project site within Waimea Town. The roadway connects to Waimea Road, and provides access to the residential areas on either side of Kaunualii Highway, as well as the park area on the makai side. A single traffic lane is provided on each of the four approaches to the intersection.
- **Panako Road, Waimea Town** - This two-lane street extends one block mauka of Kaunualii Highway to provide access to Waimea Road and the commercial uses and parking areas along Waimea Road. The street extends several blocks makai to provide access to the Ishihara Market and the adjacent residential areas. On the mauka side, the approach to Kaunualii Highway is wide enough to permit vehicles turning right to pass by vehicles waiting to turn left or continue straight across the intersection. Only a single lane is provided for the makai-side approach. No turn lanes are provided on Kaunualii Highway although the curb parking is restricted near the intersection, thus allowing use by vehicles turning right or by through vehicles passing by vehicles waiting to turn left.
- **Menehune Road/Hapule Road, Waimea Town** - Menehune Road connects to the west end of Waimea Road commercial area as well as provides access to residential areas mauka of Waimea Road. The intersection with Waimea Road is located only about two car lengths from Kaunualii Highway. The Menehune Road approach to Kaunualii Highway has sufficient width to allow right-turn vehicles to pass by vehicles waiting to turn left. Hapule Road provides access to the commercial uses and residential area makai of Kaunualii Highway.
- **Pakala Village Road** - This gravel roadway provides access to the Pakala Village and Makaweli Post Office on the makai side of Kaunualii Highway and to the Kaawani Village on the mauka side. Both approaches of this gravel roadway provide sufficient width to allow right-turn vehicles to pass by vehicles waiting to turn left.
- **Kaunakani Mill Road** - This paved two-lane street provides access to the Mill and village on the makai side of Kaunualii Highway. A short right-turn lane has been constructed on the eastbound approach of Kaunualii Highway.
- **Kaunakani Village Road** - This gravel roadway provides access to the Thrifty Mart and adjacent village area. The gravel roadway provides sufficient width to allow right-turn vehicles to pass by vehicles waiting to turn left. The Thrifty Mart has a direct exit driveway connection to Kaunualii Highway located east of the gravel roadway.

EXISTING TRAFFIC VOLUMES

Near the Project site, the State of Hawaii Department of Transportation (DOT) periodically makes 24-hour machine counts of traffic along Kaunualii Highway at the intersection with Menehune Road/Hapule Road (Count Station #17-A), and east of Pakala Village Road at the Mahinauli Stream Bridge (Count Station #15-D). The most recent weekday count at Menehune Road was made June 17, 1997, and the most recent weekday count at the Mahinauli Stream station was made June 24, 1997. Based on these counts, the daily volumes of vehicles on area roadways are as follows:

Location	Weekday Volumes
Kaunualii Highway	10,200 Vehicles
East of Pakala Village Road	11,300
East of Menehune Road	2,300
Menehune Road	720
Hapule Road	

The State DOT has not made any weekend traffic counts along Kaunualii Highway in recent years. Saturday and Sunday traffic counts are available for Kuhio Highway at the Count Station #CC-2 near Kilauea. Daily traffic counts were obtained from that location for the month of January 1998. The counts indicated that traffic volumes along Kuhio Highway were higher on Saturdays than for Sundays, with the highest hourly volumes on either day occurring during the midday and early afternoon. For the weekdays, Fridays had the highest volumes, with the afternoon peak hour volumes slightly above those for Saturday.

On weekdays, the traffic impacts of the Kapalawai Resort is expected to be greatest during the morning and afternoon commute peak periods when some resort employees would begin/start their work shifts, combined with guest arrivals and departures. On a Saturday, the highest resort traffic volumes would likely be generated during the early afternoon as a result of shift changes during that time as well as guest arrival/departures and local resident arrivals/departures of the beach, restaurants, and other facilities of the resort.

Wilbur Smith Associates (WSA) conducted special traffic turning movement counts during Friday January 15, 1999 to represent traffic on a weekday afternoon and on January 16, 1999 to represent traffic on a Saturday afternoon. The counts were recorded for each 15-minute period between 6:00 and 8:30 AM and 3:00 and 6:30 PM on Friday, and from 11:00 AM to 4:00 PM on Saturday. The highest one-hour counts in each of the three periods are used to represent peak traffic volumes during the two weekday peak hours and for the Saturday peak hour. The traffic volumes recorded for these periods are depicted in Figures 2-2 and 2-3 for a weekday and a Saturday, respectively.

Weekday Peak Hour Volumes

The highest weekday morning traffic on Kaunualii Highway near the Project site occurred between 6:30 and 7:30 AM, with a total of 724 vehicles in both directions. Traffic volumes along Kaunualii Highway were higher to the east and west of the Project site, with peak hour volumes on those sections approaching 800 vehicles. Traffic volumes were higher in the westbound travel direction, most likely due to workers commuting to Barking Sands Pacific Missile Range facilities. Within

Waimea Town, the traffic on the mauka leg of each intersection was much higher than the volume on the makai side of Kaunualii Highway, with Menehune Road having higher volumes than Panako and Ala Wai Roads.

The highest traffic volumes on Kaunualii Highway during the Friday afternoon generally occurred between 3:45 and 4:45 PM when a total of 964 vehicles were counted near the Project site, or about 26% higher than the morning peak hour. As in the morning, the traffic volumes along Kaunualii Highway increased eastward and westward from the Project site. Traffic volumes were higher in the eastbound direction in the afternoon.

Within Waimea Town, the traffic volumes on the cross street were generally two to three times higher than the volumes during the morning peak hour. The highest volumes occurred on the mauka legs of Panako Road and Menehune Road, with totals of almost 300 vehicles on each. These volumes reflect concentration of businesses and parking in the area adjacent to these streets.

Saturday Peak Hour Volumes

The highest volume of traffic on Saturday was recorded between 1:45 and 2:45 PM. The Saturday traffic volumes along Kaunualii Highway were similar to those in the weekday morning peak hour, with 719 vehicles near the Project site. For the cross streets, the Saturday traffic volumes were higher at most locations and for most movements than those recorded during the weekday morning peak hour, but less than those recorded during the Friday afternoon peak hour.

EXISTING TRAFFIC CONDITIONS AT KEY INTERSECTIONS

Traffic conditions were analyzed for the Friday morning and afternoon one-hour periods that have the highest volumes of traffic and for the Saturday afternoon peak hour.

Methodology for Analyzing Levels of Service

The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for use in evaluating the effectiveness and quality of service for roadways and streets. Different methodologies are available for analyzing traffic signal-controlled intersections and other types of roadways.

The TRB evaluation methods use a concept known as level-of-service (LOS). This concept describes facility operations on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively. The methods generally compare traffic volumes on a facility to the facility's theoretical capacity. Capacity is estimated based on the facility's physical characteristics (e.g. number and widths of lanes), traffic characteristics (e.g. types of vehicles), and type of traffic controls. The comparisons are frequently referred to as the volume-to-capacity ratio (V/C). The methodologies are described in the *1994 Highway Capacity Manual (1994 HCM)*.

Signal-Controlled Intersections - Traffic conditions at traffic signal-controlled intersections were evaluated using the Operations Analysis methodology described in the 1994 HCM. Using this

method, the level-of-service is based on the average delay time per vehicle passing through the intersection. The delay time, calculated in seconds, is the result of the phasing and timing of the traffic signal as well as the intersection's physical layout and the composition of the traffic. Average delay time and level-of-service are estimated for the entire intersection, for each roadway approach, and for each traffic movement or lane group. A description of the characteristics and criteria associated with LOS A through LOS F is provided in Figure 2-4.

The methodology also calculates a ratio of actual or estimated peak hour traffic volumes to the theoretical capacity of the intersection. This ratio indicates the proportion of available capacity being used by traffic volumes and where there is unused capacity available for future traffic increases. This volume-to-capacity ratio (V/C) reflects the physical characteristics of the intersection and the traffic characteristics, and is somewhat independent of the efficiency of the traffic signal phasing/timing.

Unsignalized intersections - At intersections with STOP sign controls, the level of service was calculated using the 1994 HCM procedures for intersections with STOP or YIELD signs. In this methodology, the six levels of service, A through F, are used to describe traffic conditions for those movements that must yield to other movements:

- Left-turn out of the side street or driveway;
- Through movement from the side street;
- Right-turn out of the side street or driveway; and
- Left-turn into the side street.

Through vehicles on the major streets are not required to yield to other movements at two-way STOP controlled intersections.

The general indicator of intersection delay is determined by calculating the one-hour capacity for each key movement, based on the conflicting traffic volumes, and then comparing the number of vehicles making that maneuver to the calculated capacity. The unused or "reserve" capacity for the movement is then used to identify a delay time and a level-of-service for that movement. Unlike analysis at signalized intersections, an overall intersection level-of-service is not calculated, but a level-of-service is calculated for each lane group subject to the STOP or YIELD condition.

The level-of-service criteria for unsignalized intersections with STOP or YIELD controls is defined in Table 2-1.

Intersection Conditions

The traffic conditions at each of the key intersections are summarized in Table 2-2 for the weekday peak hours and the Saturday midday peak hour. The conditions indicated in the table are for the traffic movement at each intersection that experiences the longest wait time (delay) to travel through the intersection. For these STOP sign-controlled intersections, the longest delay usually occurs for the higher volume left-turn movement from the cross street, such as the left turn movement from Menehune Road at its intersection with Kaunualii Highway.

During the weekday morning peak hour, the left-turn movements at each of the six key intersections included in the study operated with short delays averaging between 9.5 and 11.2 seconds, equivalent to levels of service (LOS) B or C.

Average delays for the left-turn movements during the Friday afternoon peak traffic hour were higher at each of the intersections than the delays for the morning peak hour. This resulted from the higher

Table 2-1
LEVEL-OF-SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS
Kapalawai Resort Traffic Impact Study

LOS	Average Stopped Delay (seconds/vehicle)
A	<5.0
B	5.1 - 10.0
C	10.1 - 20.0
D	20.1 - 30.0
E	30.1 - 45.0
F	>45

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Chapter 10, 1994.

volume of through traffic along Kaunualii Highway during the afternoon peak hour, which provides fewer gaps for vehicles to exit the side streets, combined with a higher volume of vehicles turning left at several of the cross streets.

The longest Friday afternoon peak hour delays were calculated for the vehicles turning left from makai-bound Menehune and Panako Roads in Waimea Town. The delays for these left-turn movements averaged approximately 22 to 23 seconds, equivalent to LOS D. Field observations indicated that delays by left-turn vehicles on Menehune Road did occasionally interfere with vehicles exiting Waimea Road to turn right onto Kaunualii Highway. The left turn traffic at the other study intersections operated at LOS C conditions.

For the Saturday midday peak hour, the delay for most of the left-turn movements were similar to those for the weekday morning peak hour. The exception was the turns from the Kaunakani Village Road, where the average delay (17.5 seconds, LOS C) was the same as for the Friday afternoon peak hour.

**Table 2-2
EXISTING CONDITIONS AT KEY INTERSECTIONS
Kapalawai Resort Traffic Impact Study**

Kaunualii Hwy. Intersection and Traffic Movement	Friday Morning Peak Hour		Friday Afternoon Peak Hour		Saturday Midday Peak Hour	
	ADPV	LOS	ADPV	LOS	ADPV	LOS
Menehune Road Makalbound Left Turn	11.2	C	23.0	D	11.9	C
Pana'oa Road Makalbound Left Turn	9.5	B	21.9	D	10.4	C
Ala Wai Road Makalbound Left Turn	10.3	C	15.9	C	9.6	B
Pakala Village Road Maulakound Left Turn	9.8	B	15.4	C	9.9	B
Kaumakani Mill Road Maulakound Left Turn	10.3	C	14.0	C	9.3	B
Kaumakani Village Road Maulakound Left Turn	10.5	C	17.5	C	10.2	C

ADPV = Average delay per vehicle, in seconds.
LOS = Level of service for the traffic movement.

Wilbur Smith Associates; February 10, 1999.

Chapter 3 2002 CONDITIONS WITHOUT THE PROJECT

The Kapalawai Resort is planned for completion and full operation by early year 2002. Forecast traffic volumes and conditions are presented for early in year 2002 without the Kapalawai Resort Project as a base from which to identify the incremental effects of the Project.

ROADWAY IMPROVEMENTS

No major modifications are expected for the roadways near the Project site by year 2002. The State DOT plans to construct left-turn lanes on Kaunualii Highway at several intersections that have higher volumes of vehicles turning left from Kaunualii Highway. Left-turn lanes are planned for Kaunualii Highway at the intersection with the Pakala Village/Post Office Road and with the Kaumakani Mill Road. The left-turn lanes should improve traffic safety at these intersections and reduce delays to through traffic caused by vehicles waiting to turn left. The additional lanes should not have a significant effect on the delays to traffic entering Kaunualii Highway from the cross streets at these locations.

TRAFFIC GROWTH WITHOUT THE PROJECT

No major new development projects are anticipated for the areas near the Project site by early 2002. Traffic increases over the next three years are expected to primarily result from increases in activity levels for the existing commercial and recreational uses in the southwest Kauai area, and small infill development or small increments of new developments in the area. An annual area growth factor was used to estimate the traffic increases from these sources. In addition, the Pioneer Hi-Bred facility being constructed near the Project site would add traffic along the adjacent section of Kaunualii Highway.

Area Traffic Growth Factor

The traffic growth factor for the roadways near the Project site was based on the traffic counts for the nearest count station along Kaunualii Highway for which historic count data was available. Traffic count data from State DOT count stations #15-D and #17-A, located along Kaunualii Highway in the study area, was available for the period between 1993 and 1997, which indicated average annual increases of 1.6 to 1.8% along Kaunualii Highway. Based on these counts, the average annual growth rate of 1.8% was used to represent traffic increases for the next three years, both for weekdays and weekends. This annual rate provides an increase of 5.5% over the three years.

Pioneer Hi-Bred Facility

The Pioneer Hi-Bred facility is expected to employ approximately 50 workers. This work force is estimated to generate approximately 23 and 22 peak vehicle trips during the weekday morning and afternoon peak hours, respectively. The routing for these trips was based on local traffic patterns. No vehicle trips were added to the Saturday midday peak hour.

Weekday and Sunday Peak Hour Volumes

The growth factor was applied to all traffic movements at the key intersections near the Project site, and the Pioneer Hi-Bred trips were added to the weekday traffic volumes. The resultant traffic volumes for the weekday and Saturday peak hour periods are depicted in Figures 3-1 and 3-2, respectively.

TRAFFIC CONDITIONS AT KEY INTERSECTIONS

The traffic conditions for the left-turn movements from the cross streets at the key Kaunuaiali Highway intersections are summarized in Table 3-1.

**Table 3-1
2002 CONDITIONS AT KEY INTERSECTIONS WITHOUT PROJECT
Kapalawai Resort Traffic Impact Study**

Kaunuaiali Hwy. Intersection and Traffic Movement	Friday Morning Peak Hour		Friday Afternoon Peak Hour		Saturday Midday Peak Hour	
	ADPV	LOS	ADPV	LOS	ADPV	LOS
Menchune Road Makai-bound Left Turn	12.4	C	27.6	D	13.0	C
Panako Road Makai-bound Left Turn	10.3	C	26.5	D	11.2	C
Ala Wai Road Makai-bound Left Turn	11.2	C	18.1	C	10.3	C
Pakala Village Road Mauka-bound Left Turn	10.8	C	18.0	C	10.6	C
Kaunakani Mill Road Mauka-bound Left Turn	11.4	C	15.6	C	9.8	B
Kaunakani Village Road Mauka-bound Left Turn	11.5	C	20.1	D	10.9	C

ADPV = Average delay per vehicle, in seconds.
LOS = Level of service for the traffic movement.

Wilbur Smith Associates, February 10, 1999.

In the weekday morning peak hour, the critical left-turn movement from each of the study intersections is forecast to operate at LOS C.

In the weekday afternoon peak hour, the critical left-turn movements at the Menchune and Panako Road intersections would remain at LOS D, although the delay times would be approaching the threshold for LOS E (30 seconds). The additional traffic at the Kaunakani Village Road intersection would worsen conditions to LOS D for the left-turn traffic at that intersection. The other left-turn movements would remain at LOS C.

The delays to left-turns at each of the intersections would increase by around one second or less for the Saturday midday peak hour. Left-turn traffic conditions would worsen to LOS C for the intersections with Ala Wai and Pakala Village Roads (from LOS B). The other intersections would remain at their existing LOS B or C conditions.

Chapter 4 2002 CONDITIONS WITH THE PROJECT

The Kapalawai Resort is planned for completion and full operation by early year 2002. The traffic assessment reflects a peak season level of use of the Project for both a weekday and a Saturday.

PROJECT DESCRIPTION

Destinations Villages Kauai, LLC plans to develop the Kapalawai Resort project on a 170-acre site approximately one-half mile on the Lihue (east) side of Waimea Town.

The Project will have an estimated 250 units for visitor accommodations, constructed as stand-alone cottages or duplexes. The guest facilities will include two dining facilities and on-site recreational areas for swimming tennis, and other activities. The present Robinson Family residence and related structures will be maintained as a museum facility to preserve the history of this portion of Kauai.

Access to the Kapalawai Resort will be provided by two one-way driveway connections to Kaunualii Highway. The existing paved driveway to the Robinson Family residence, located near the western (Waimea) boundary of the site, will serve as the entrance driveway. The exit driveway will intersect Kaunualii Highway at the location of the existing driveway to plantation homes, located about 480 feet east of the entrance driveway.

VEHICLE TRIP GENERATION

The number of vehicle trips to/from the Project was estimated using the average trip generation rates for a full-service resort hotel (land use category #330) as compiled in *Trip Generation*¹ by the Institute of Transportation Engineers (ITE). The ITE trip rates for a resort hotel are generally higher than those for either Waikiki or Neighbor Island hotels. Therefore, the use of the ITE trip rates should provide a conservative (high) estimate of the number of trips generated by the Kapalawai Resort Project.

The trip rate selected for weekdays was based on the number of occupied rooms, rather than other available rates based on total rooms or total number of employees. The rate based on occupied units is more reflective of peak season. The ITE Saturday rate for occupied units is about twice the weekday rate. This large differential was due to only one observation for Saturday for this rate basis, which may have included unique features that resulted in higher weekend use unrelated to the number of guest units. The ITE Saturday rate was used since it should fully reflect any weekend use of the Resort's dining and other facilities by local residents, as well as visitors to the museum. The estimated numbers of weekday and Saturday vehicle trips was based on an occupancy level of 90% of the units, which reflects a high usage day in the peak season.

¹ *Trip Generation, Sixth Edition, Institute of Transportation Engineers, 1997.*

In addition, public access would be permitted to the beach areas of the site. For forecast purposes, it was assumed that a peak of approximately 40 parking stalls would be used by residents using the beach areas. The trip rates per parking space are based on typical usage rates for these types of uses.

The trip rates and the numbers of vehicle trips estimated for the Project during the weekday and Saturday midday peak hours are summarized in Table 4-1.

Item	Morning Peak Hour		Afternoon Peak Hour		Daily	
	To Project	From Project	To Project	From Project		
Trip Generation Rates (1)						
Resort - Weekday	0.30	0.17	0.47	0.29	0.59	8.00
Saturday	NA	NA	NA	0.615	0.615	13.43
Beach - Weekday	0.04	0.01	0.05	0.085	0.25	2.00
Saturday	NA	NA	NA	0.17	0.50	4.00
Estimated Vehicle Trips for Weekday						
Resort	67	39	106	66	67	1,800
Beach	2	0	2	3	7	80
Totals	69	39	108	69	74	1,880
Estimated Vehicle Trips for Saturday						
Resort	NA	NA	NA	138	139	277
Beach	NA	NA	NA	7	13	20
Totals	NA	NA	NA	145	152	297

(1) Resort rates per occupied room for resort and per parking stall for beach area.
NA = Not included in the analyses
Wilbur Smith Associates, February 10, 1998.

The Project is estimated to generate a total of about 1,880 vehicle trips on a weekday during the peak visitor season and about 3,180 vehicle trips on a Saturday. In the weekday morning peak hour, about 108 vehicle trips would be generated to or from the Project, including arriving and departing employees. Higher levels of guest activity in the afternoon peak hour would result in 143 vehicle trips to or from the site, with the trips almost evenly split between vehicles entering and exiting the Project. A total of 297 vehicle trips could be generated by peak use on a Saturday afternoon, which would reflect a special event at the site that attracts local residents and/or visitors from other resort areas.

PEAK HOUR TRAFFIC VOLUMES

The Project vehicle trips were distributed and assigned to the adjacent roadway system based on the existing traffic patterns in the study area. Slightly more trips were assigned to/from areas east (Lihue/Pointe side) of the Project than to the west (Waimea Town side). The resultant year 2002 traffic volumes at the key intersections near the Project are depicted in Figures 4-1 and 4-2 for the weekday and Saturday peak hours, respectively.

The Project is estimated to increase the peak hour volumes on Kaunualii Highway just to the east of the site by 8% during the weekday peak hours and by 20% on a Saturday with special events at the site. To the west, the Project traffic would add an estimated 6% increase to the weekday peak hour volumes and 18% to the Saturday peak hour volumes on Kaunualii Highway near the site.

TRAFFIC CONDITIONS AT KEY INTERSECTIONS

Traffic conditions during the weekday and Saturday peak hours with the Project is summarized for each key intersection in Table 4-2.

Project Driveways

The left-turn movements into and out of the Project driveway connections to Kaunualii Highway are forecast to operate at very acceptable conditions for each of the peak hour periods. As listed in Table 4-2, the vehicles turning left from the mauka-bound exit driveway would operate at LOS C during each period. The left-turn movement from westbound Kaunualii Highway would operate at LOS A with the forecast volumes.

Based on the forecast peak hour volumes and traffic conditions, STOP sign controls would be appropriate for the exit driveway.

Nearby Key Intersections

In the weekday morning peak hour, the conditions for the critical left-turn movement from each of the study intersections is forecast to remain at LOS C. The Project would increase the average delay by about one second or less for the left-turn movement at each intersection.

Table 4-2
2002 CONDITIONS AT KEY INTERSECTIONS WITH PROJECT
Kapalawai Resort Traffic Impact Study

Kaunualii Highway Intersections and Traffic Movement	Friday Morning Peak Hour		Friday Afternoon Peak Hour		Saturday Midday Peak Hour	
	ADPV	LOS	ADPV	LOS	ADPV	LOS
Menehune Road Makai-bound Left Turn	13.3	C	31.4	E	16.0	C
Panako Road Makai-bound Left Turn	11.0	C	31.2	E	14.2	C
Ala Wai Road Makai-bound Left Turn	12.1	C	20.3	D	12.8	C
Project Driveways Mauka-bound Left Turn	11.7	C	19.6	C	16.6	C
Westbound Left Turn	3.5	A	4.4	A	3.7	A
Pakala Village Road Mauka-bound Left Turn	11.8	C	20.7	D	13.6	C
Kaumakani Mill Road Mauka-bound Left Turn	12.5	C	17.6	C	12.2	C
Kaumakani Village Road Mauka-bound Left Turn	12.7	C	23.0	D	13.8	C

ADPV = Average delay per vehicle, in seconds.

LOS = Level of service for the traffic movement.

Wilbur Smith Associates, February 10, 1999.

In the weekday afternoon peak hour, the Project traffic would increase average delay for the critical left-turn movements at the Menehune and Panako Road intersections by about 4 to 5 seconds. This increase would worsen the conditions to LOS E, from LOS D. Given the forecast LOS E conditions, the afternoon conditions at these two intersections were checked against the warrants for installation of traffic signal controls (see "Potential Mitigation").

For the weekday afternoon peak hour, the additional traffic at the Pakala Village Road intersection would increase average delay to LOS D for the left-turn traffic at that intersection. The left-turn movements at the other intersections would remain at LOS C.

The delays to left-turns at each of the intersections would increase by about 2 to 3 seconds for the Saturday midday peak hour. Left-turn traffic conditions would worsen to LOS C for the intersection with the Kaumakani Mill Road (from LOS B). The other intersections would remain at the LOS C conditions forecast without the Project.

POTENTIAL MITIGATION ACTIONS

Mitigation actions were considered at the Kaunualii Highway intersections with the Project driveways and with Panako and Menehune Roads.

Project Driveways

The analyses indicate that STOP sign control is appropriate for the exit driveway approach to Kaunualii Highway for the year 2002 peak hour conditions.

Left-turn storage lanes are typically considered for locations where 100 or more vehicles turn left in a one-hour period. Because of the high speeds along this section of Kaunualii Highway, it is recommended that a left-turn lane be provided for the vehicles waiting to turn left from westbound Kaunualii Highway into the Project entrance driveway. This would reduce the potential for accidents as well as delays to through traffic. The length of the left-turn storage lane should be sufficient to accommodate at least 3 or 4 waiting vehicles, or a minimum of 100 feet in length.

Separate left- and right-turn lanes are recommended for the exit driveway at the intersection with Kaunualii Highway to minimize any delay to vehicles turning right from the driveway.

A right-turn deceleration lane is recommended on westbound Kaunualii Highway at the entrance driveway for the Project for safety purposes and to minimize delays to through traffic.

Panako and Menehune Roads

The analyses indicate that the increased volume of Project and non-Project traffic at these two intersections with Kaunualii Highway would result in increased delays by vehicles turning left from the cross streets. The traffic turning left from the makai-bound approach of each street is expected to experience delays equivalent to LOS E for the Friday afternoon peak traffic hour. The conditions for traffic turning left from the mauka-bound approaches are forecast as LOS D at Panako Road and LOS C for Hapule Road (opposite approach of Menehune Road).

Installation of a traffic signal at one or both of these intersections would be one method of facilitating this left-turn movement, given the delays in waiting for a gap in Kaunualii Highway traffic. The State DOT would have to approve any installation of a traffic signal along a State highway. Except for rare exceptions, the State DOT will not approve a traffic signal for a location unless it satisfies one or more "warrants" for installation of a traffic signal.

Highway officials have adopted a series of these "warrants" that govern consideration of a traffic signal at a location.³ If a location does not satisfy one or more of the warrants, a traffic signal is not appropriate; if it satisfies one or more warrants, a traffic signal *may be considered* as a potential action to improve operations or safety.

The forecast conditions at the two intersections with Kaunualii Highway were assessed relative to two of the warrants:

³ Manual on Uniform Traffic Control Devices, U. S. Department of Transportation, Federal Highway Administration, 1988.

- **Warrant #10 Peak Hour Delay**

The initial criteria for this warrant is that the minor street approach must experience total delay of at least four vehicle hours for a single lane approach and five vehicle hours for a two-lane approach, during the peak one-hour period.

Neither of the intersections satisfy this requirement since the estimated total delay in the worst peak one hour (Friday afternoon peak hour) is 0.54 vehicle hours at the Panako intersection and 0.52 vehicle hours at the Menehune Road intersection, with these total delays substantially below the minimum requirement for either a single- or two lane approach.

- **Warrant #11 Peak Hour Volume**

For the number of lanes at this intersection and the Friday peak hour volumes along Kaunualii Highway, this warrant would require either:

1. A minimum of 75 vehicles exiting the higher volume approach of the cross street in the peak hour if that approach has only a single approach lane.
2. A minimum of 100 vehicles exiting the higher volume approach of the cross street in the peak hour if that approach has two approach lanes (separate left- and right-turn lanes).

The makai-bound approaches on both streets has a single wide lane that permits right-turn vehicles to pass by the waiting left-turn vehicles, thereby functioning as two approach lanes. The Panako Road approach has 75 peak hour vehicles, while the Menehune Road approach has 143 vehicles in the afternoon peak hour. However, the left-turn and through volumes, those with the long delays, amount to only 31 vehicles at Panako Road and 48 at Menehune Road.

The Panako Road intersection does not satisfy this warrant, while the Menehune Road intersection does meet the minimum volume warrant as a result of the very high volume of vehicles turning right from this approach.

The Menehune Road approach would pose a traffic operations problem with the installation of a traffic signal. The traffic signal would result in the queue of waiting vehicles stacking beyond and blocking the left-turns from the Waimaea Road approach to Menehune Road. The Panako Road intersection provides the better geometric layout for installation and operation of a traffic signal as a result of its slightly longer block length between Kaunualii Highway and Waimaea Road.

Due to the marginal satisfaction of the minimum warrants and the potential queuing problems on the mauka side of the intersections, a traffic signal does not appear appropriate at the intersections for year 2002. If a traffic signal is installed in the future, the Panako Road intersection would likely provide the better location due to the longer block length. A signal at Panako Road would also benefit the Menehune Road traffic by providing gaps in the westbound traffic flow along Kaunualii Highway. If a signal were to be installed at Panako Road, the 2002 Friday peak hour volumes would approximate 54% of intersection capacity and would operate at LOS B.

The installation of STOP signs on all four approaches (four-way STOP control) would not be appropriate for either intersection due to the much higher volumes on Kaunualii Highway as compared to either of the cross streets.

Chapter 5 SUMMARY AND CONCLUSIONS

Destinations Villages Kauai, LLC plans to develop the Kapalawai Resort project in the southwest portion of Kauai approximately one-half mile east of Waimea Town. The Project will be located on a 170-acre site on the makai side of Kaunualii Highway, a site that includes the Robinson Family residence and the agricultural lands to the east of the residence.

The Project will have an estimated 250 guest units plus restaurants, swimming pools, tennis courts and other amenities for the guests. The present Robinson Family residence and related structures will be maintained as a museum. Public access will be provided to the beach area.

Access to the Kapalawai Resort will be provided by two one-way driveway connections to Kaunualii Highway, to be located at the present driveways to the Robinson residence and the plantation houses to the east of the residence.

EXISTING CONDITIONS

Traffic conditions were analyzed at the key intersections near the Project site for the morning and afternoon peak hours on a Friday, and the midday peak hour on a Saturday. These include the intersections of Kaunualii Highway with Pakala Village Road, Kaunakani Mill Road, and Kaunakani Village Road to the east of the Project, and the Ala Wai Road, Panako Road, and Menelune Road intersections within Waimea Town to the west of the Project. The left-turn movements from each of these STOP sign controlled cross streets presently operates at acceptable conditions (LOS B, C or D at each).

2002 CONDITIONS WITHOUT THE PROJECT

General area growth in economic activity and small development is estimated to increase peak hour traffic volumes by about 6% by year 2002. With this increase, the traffic operations at each of the key intersections near the Project site are expected to remain at acceptable conditions during the weekday and Saturday peak hours.

2002 CONDITIONS WITH THE PROJECT

On a peak season weekday with 90% occupancy of the units, the Project is estimated to generate 108 and 143 vehicle trips in the morning and afternoon peak hours, respectively. On a peak season Saturday, the Project is estimated to generate up to 297 vehicle trips during the midday peak hour, a number that would reflect a large volume of visitors from other hotels or local residents attending an event at the Project site. The Project would increase traffic volumes on Kaunualii Highway adjacent to the site by about 6 to 8% during the weekday peak hours, and by 18 to 20% for the Saturday midday peak hour.

With the forecast year 2002 peak hour traffic volumes, the Project driveway approach to Kaunualii Highway should operate at acceptable conditions with STOP sign control. To improve operations

and safety at this Project driveway intersections with Kaunualii Highway, the following measures are recommended:

- Provide separate left- and right-turn lanes for the exit driveway approach to Kaunualii Highway. With separate lanes, vehicles turning right would not be delayed by vehicles waiting to turn left.
- Provide a left-turn stacking lane on the westbound Kaunualii Highway approach to the intersection with the entrance driveway. With the left-turn storage lane, vehicles waiting to turn left into the entrance driveway would not block and delay the eastbound through traffic. A storage length of 100 feet is recommended for the left-turn lane, which would be sufficient for four automobiles, or three automobiles and one bus.
- Provide a right-turn deceleration lane on westbound Kaunualii Highway for vehicles entering the Project driveway to minimize delays to through traffic.

The Project traffic is not expected to significantly impact traffic conditions at the key intersections near the site during the weekday morning or Saturday midday peak hours. During the weekday afternoon peak hour, the Project traffic was estimated to add about 4 seconds to the average delay for the vehicles turning left onto Kaunualii Highway from the makai-bound approaches of Panako Road and Menehune Road, which would worsen conditions to LOS E from LOS D. This indicates long delays for the left-turn vehicles during this peak hour. Conditions at the other intersections would be at very acceptable levels during the weekday afternoon peak hour.

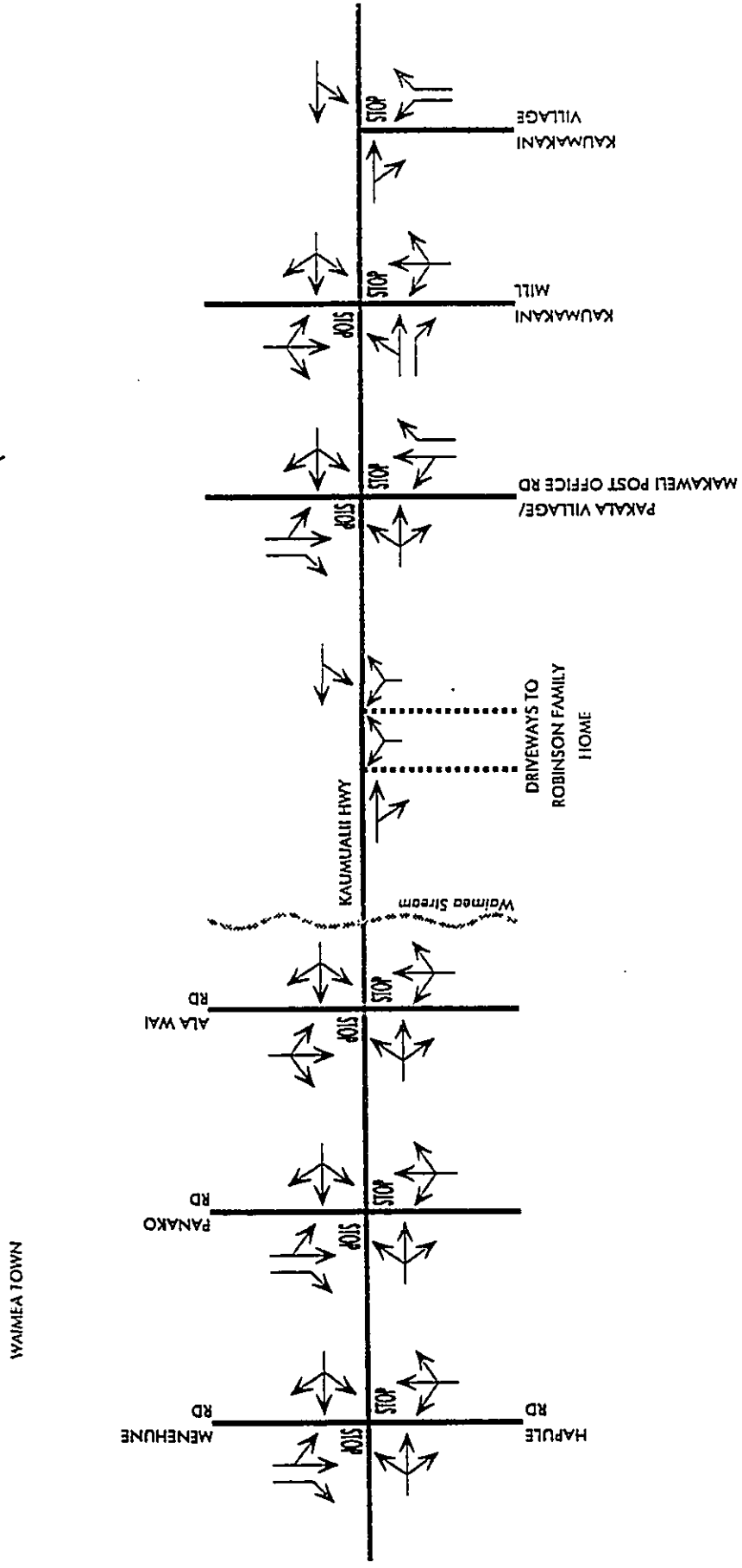
The weekday afternoon peak hour volumes and traffic conditions at the Panako Road and Menehune Road intersections were checked against the minimum traffic warrants that should be satisfied to allow consideration of a traffic signal at either intersection.

- The forecast 2002 traffic volumes and delays do not satisfy the minimum warrants needed for installation of a traffic signal at Panako Road.
- The forecast peak hour volumes at the Menehune Road intersection do exceed the minimum needed to satisfy the volume warrant and allow consideration of a signal, but the Menehune Road traffic volume is predominantly vehicles turning right that would benefit little from a signal. The peak hour delay is only about 10% of the minimum necessary to satisfy the delay warrant. The installation of a traffic signal would result in a waiting queue of vehicles that would likely interfere with traffic operations at the nearby intersection of Wainea Road with Menehune Road. Therefore the installation of a traffic signal does not appear desirable for the forecast year 2002 conditions.

The traffic conditions at these intersections should be periodically monitored to assess whether conditions may warrant installation of a traffic signal or other actions in the future.

KAPALAWAI RESORT TRAFFIC IMPACT STUDY

APPROXIMATE
NORTH
Not To Scale



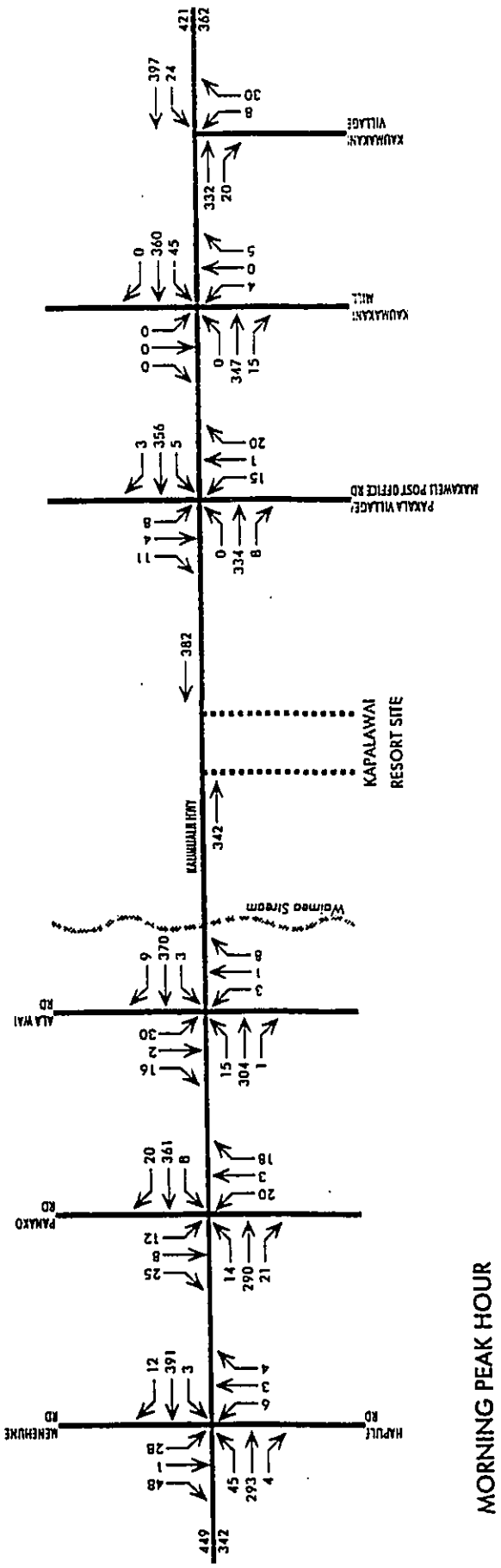
WILBUR SMITH ASSOCIATES

Figure 2-1

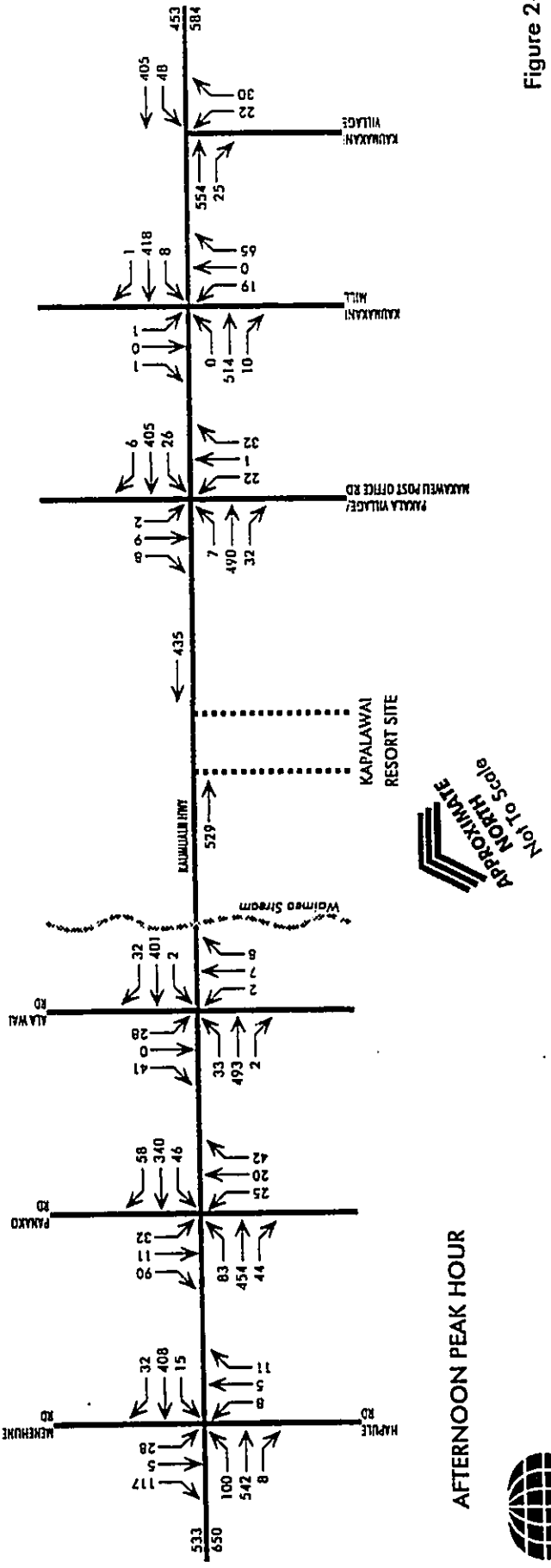
EXISTING ROADWAY LANES AND TRAFFIC CONTROLS

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KAPALAWAI RESORT TRAFFIC IMPACT STUDY



MORNING PEAK HOUR



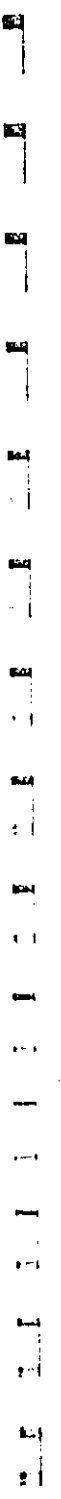
AFTERNOON PEAK HOUR

**Figure 2-2
EXISTING WEEKDAY PEAK HOUR TRAFFIC**

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WILBUR SMITH ASSOCIATES



KAPALAWAI RESORT TRAFFIC IMPACT STUDY

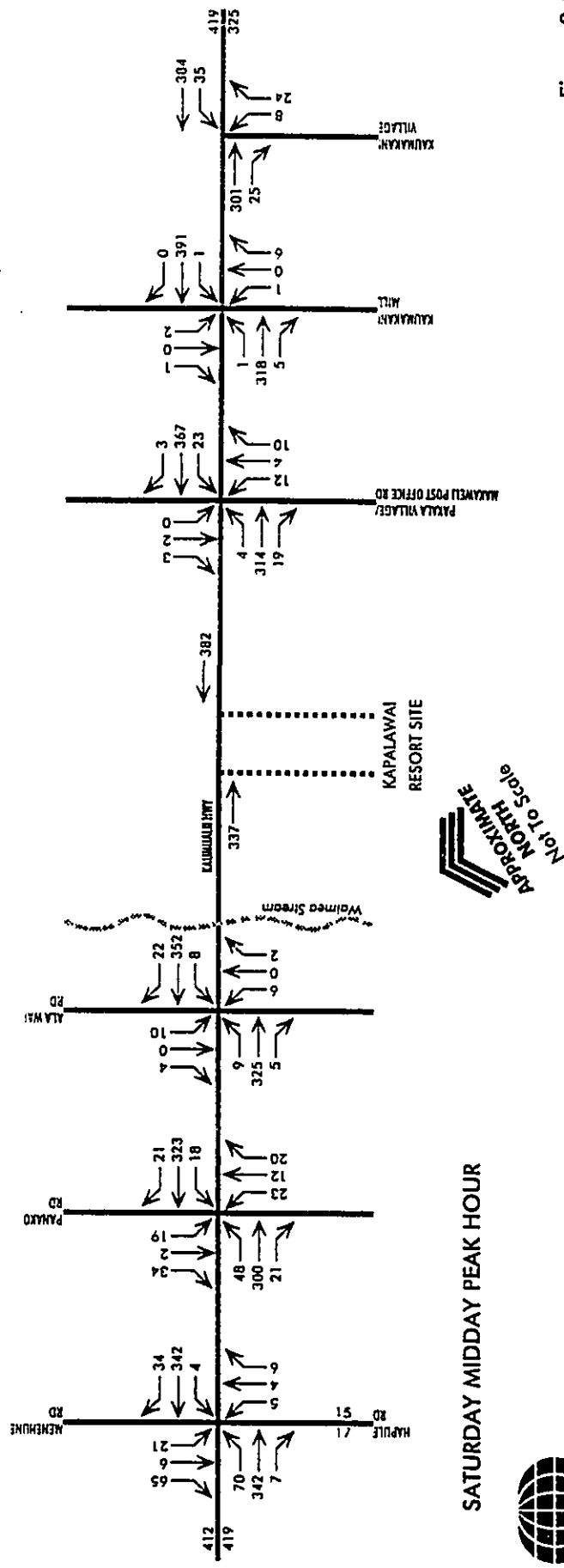


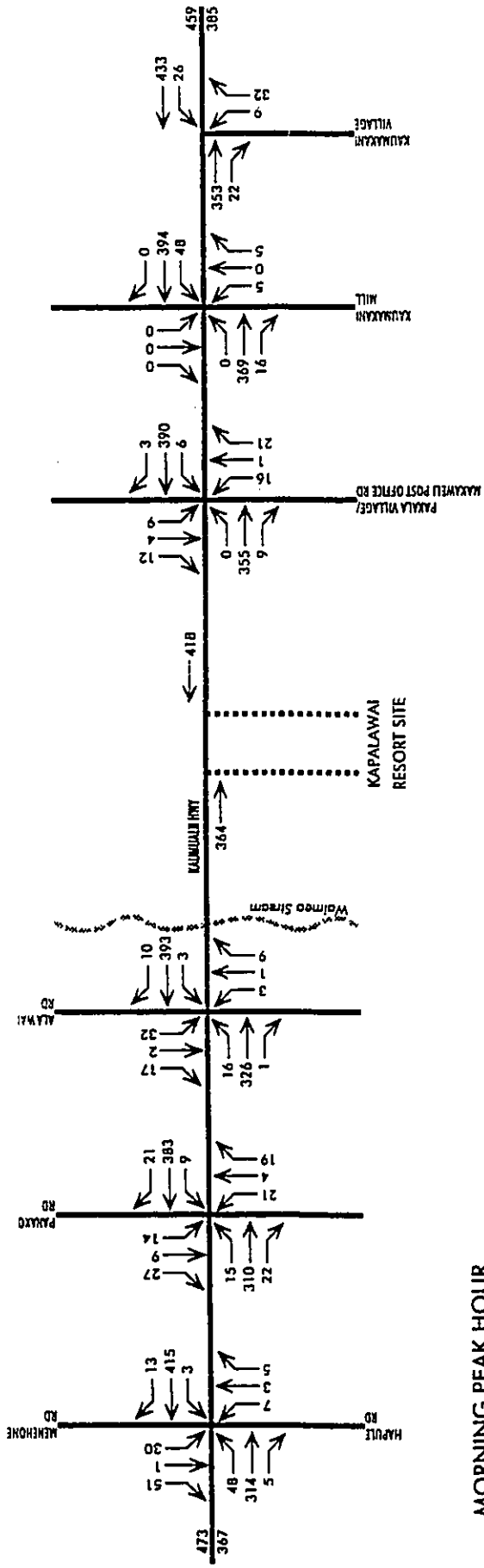
Figure 2-3
EXISTING SATURDAY MIDDAY PEAK HOUR TRAFFIC

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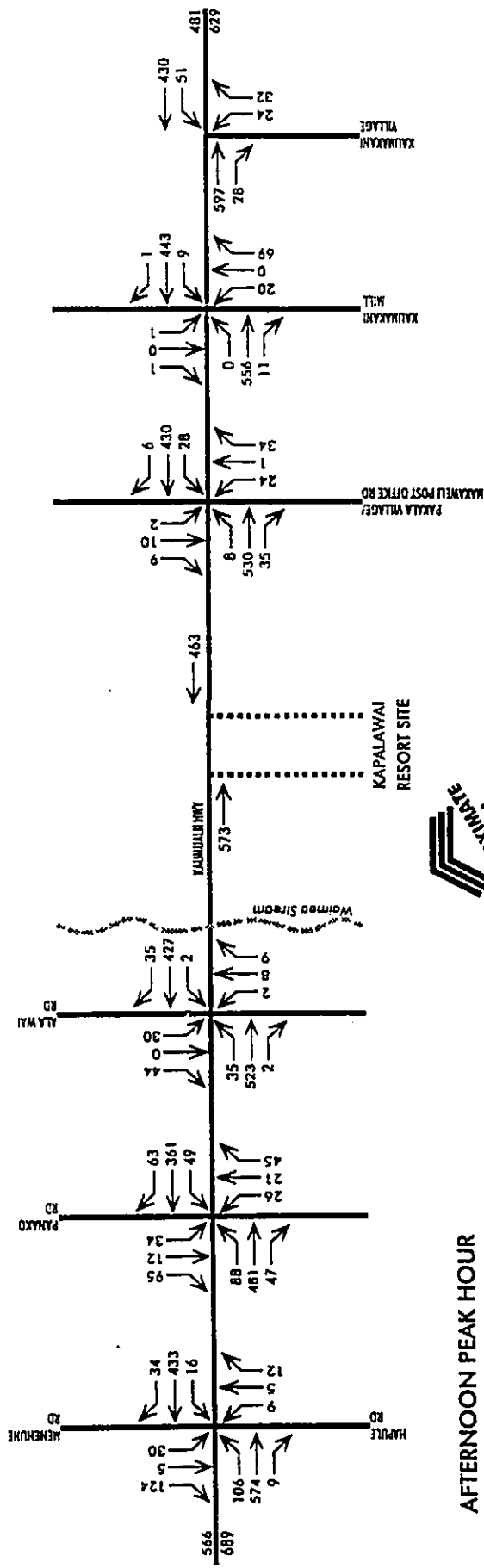


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KAPALAWAI RESORT TRAFFIC IMPACT STUDY



MORNING PEAK HOUR



AFTERNOON PEAK HOUR

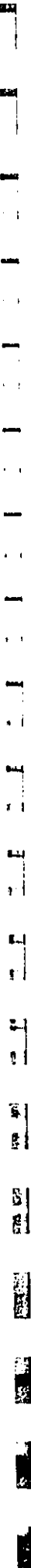
APPROXIMATE
NORTH
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Figure 3-1
2002 WEEKDAY PEAK HOUR TRAFFIC WITHOUT PROJECT

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WILBUR SMITH ASSOCIATES



KAPALAWAI RESORT TRAFFIC IMPACT STUDY

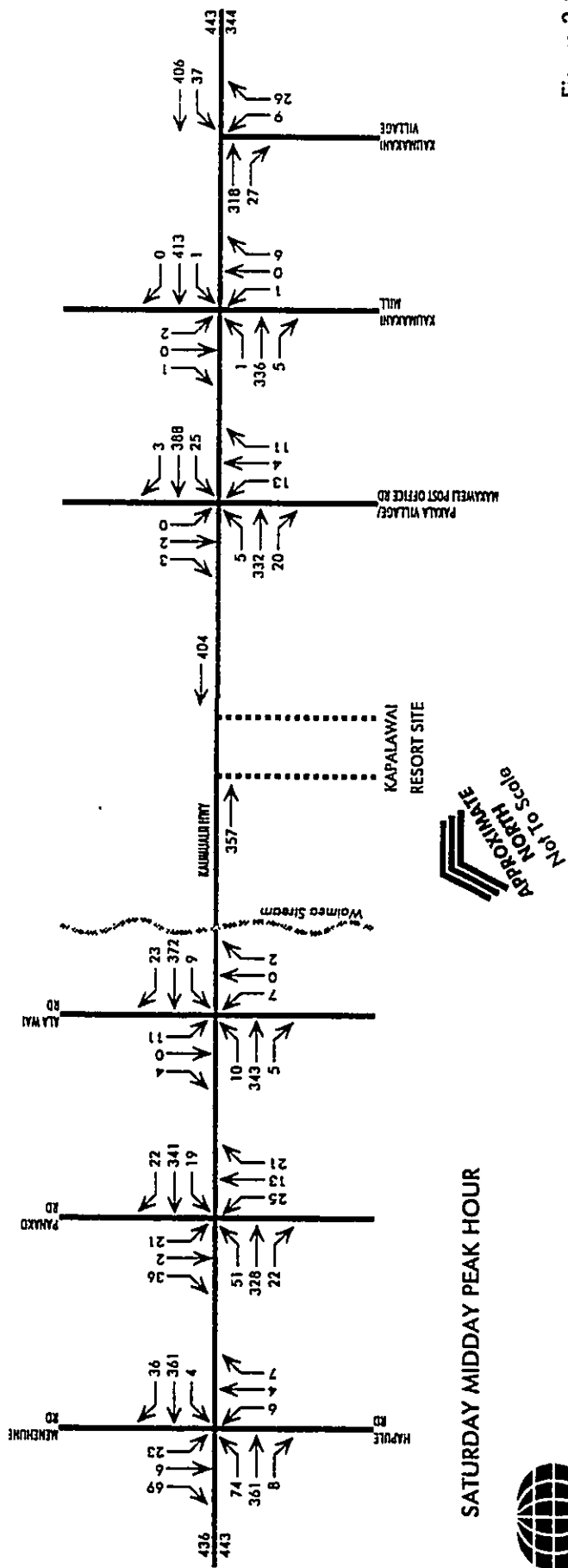


Figure 3-2

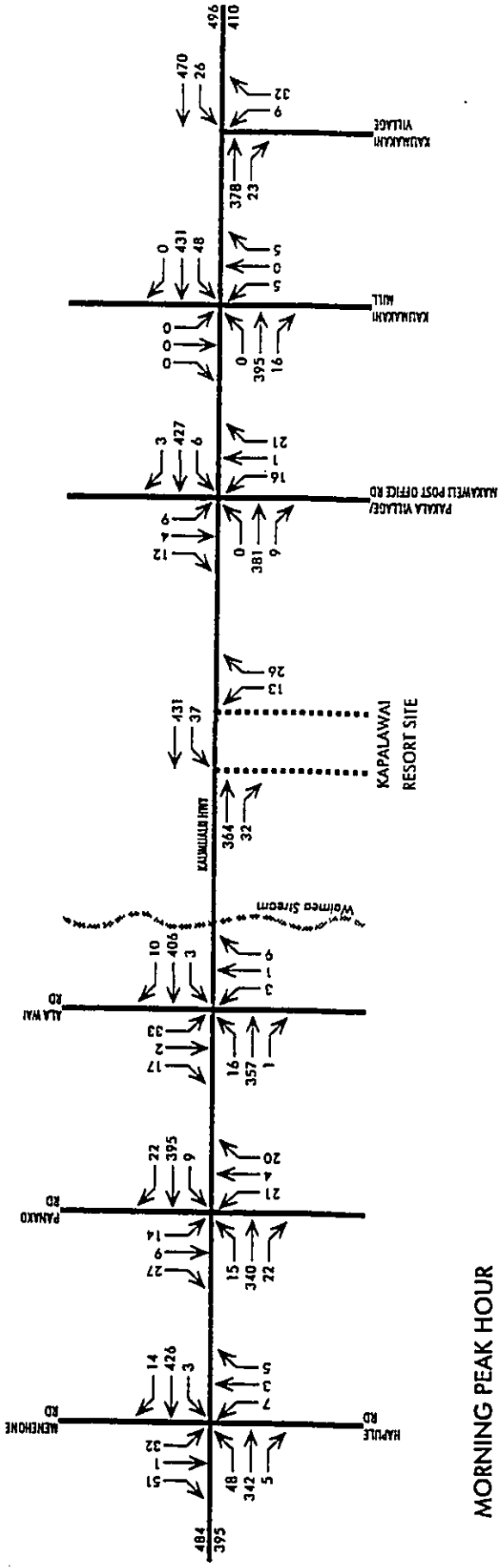
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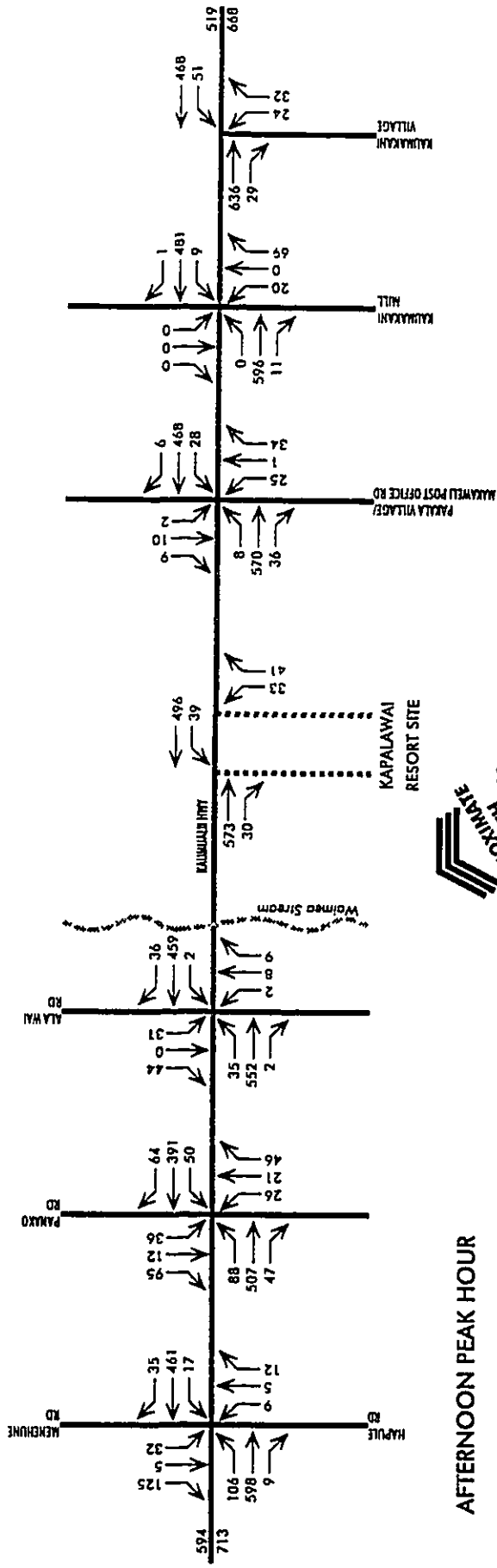
WILBUR SMITH ASSOCIATES



KAPALAWAI RESORT TRAFFIC IMPACT STUDY



MORNING PEAK HOUR



AFTERNOON PEAK HOUR



WILBUR SMITH ASSOCIATES

APPROXIMATE
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Figure 4-1
2002 WEEKDAY PEAK HOUR TRAFFIC WITH PROJECT

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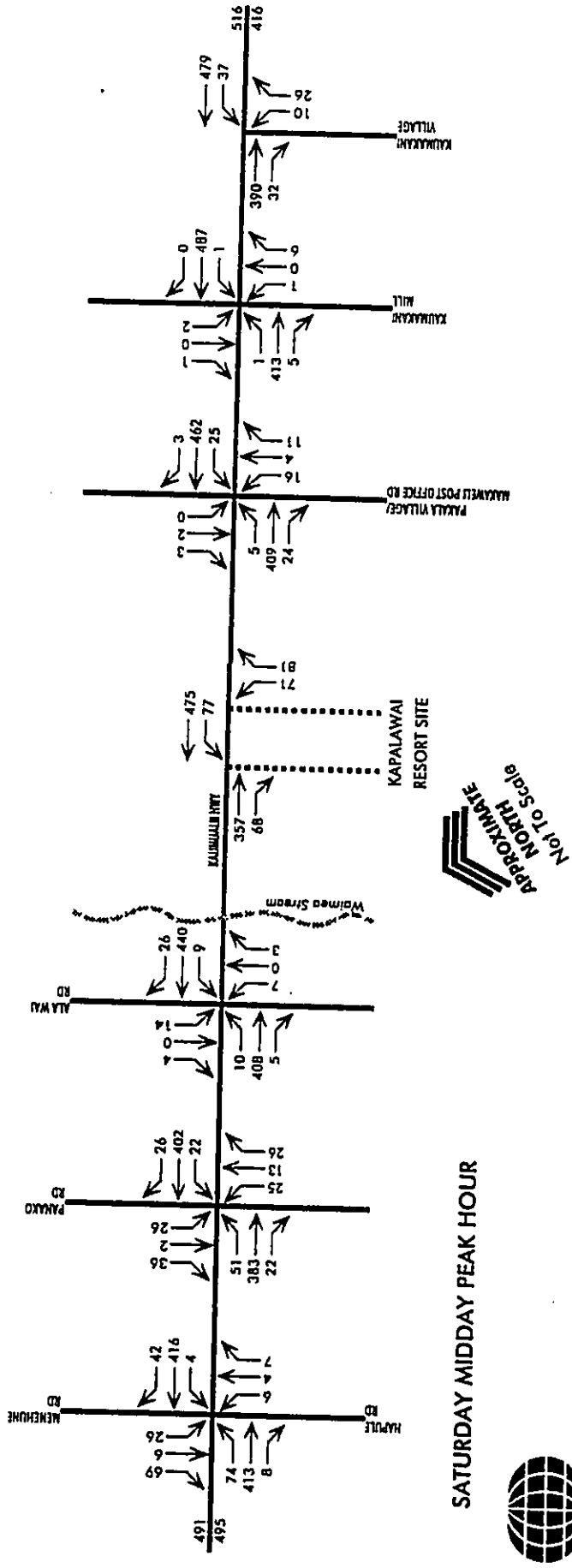


Figure 4-2
2002 SATURDAY MIDDAY PEAK HOUR TRAFFIC WITH PROJECT

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WILBUR SMITH ASSOCIATES

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Civil Engineering Report
for
Kapalawai Resort
Kapalawai, Kauai, Hawaii

September 27, 1999

Prepared for:

Helber Hastert & Fee
Governor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Prepared by:

Wagner Engineering Services
P.O. Box 851
Hanalei, Hawaii 96714

September 27, 1999

Mr. Scott Ezer, Senior Associate
Herber Hastert & Fee
Grosvenor Center, Makai Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Subject: Civil Engineering Report
Kapalawai Resort
Kapalawai, Kauai, Hawaii

Dear Mr. Ezer:

We are pleased to provide you with the attached Engineering Report update for the Kapalawai Resort. The Report has been prepared according to the scope of our proposal dated January 28, 1999, and the Master Plan provided by your office.

Mahalo for the opportunity to have been of service, and we look forward to future involvement with the project.
Very truly yours,

Ronald J. Wagner, P.E., L.S.

INTRODUCTION

The Kapalawai Resort is located on the west side of Kauai, between the towns of Waimea to the west, and Makaweli to the east. The site is bounded to the north by Kaunuaui'i Highway, and to the south by Hoanuanuu Bay.

The property is owned by Robinson Family Partners, Gay & Robinson, Inc., and Bruce Robinson, which have used the land for the family residence, garden and limited cattle grazing. The Kapalawai Master Plan plans to develop the approximately 170 acre site to resort use, including 250 cottages along the beachfront, and various support facilities related to resort use, including recreational facilities and restaurants.

This report addresses various engineering aspects associated with development of the property.

- Three different watersheds are tributary to the property, conveying storm water runoff to the site which pass under Kaunuaui'i Highway. Adequate flood protection must be provided to protect proposed structures from storm events. Additionally, drainage systems must be provided to provide for proper drainage of the site.
- The cottages, restaurants and other facilities will generate wastewater, which must be managed appropriately.
- The resort will require electrical, telephone and cable television service.
- A potable water system will be required to service the site, but is not included within the scope of this report.
- The resort will generate a significant amount of solid waste to be disposed.

This report provides solutions and recommendations for these aspects of the resort.

SUMMARY

Analysis of the various engineering aspects of the Kapalawai Master Plan indicates that the following measures should be taken.

Flood protection of proposed structures can be provided by elevating structures along the coastal flood zone to the flood zone elevation, and elevating structures to the determined flood fringe elevations in the vicinity of the existing watercourses. Additionally, site drainage systems are proposed in streets and parking areas to provide for vehicular safety, and for the drainage of runoff away from buildings. Drainage systems outlet at existing watercourses or detention areas prior to entering the ocean.

The County's nearest wastewater treatment facility is located approximately 2.5 miles distant just west of Waimea Town. It's present service area extends only as far east as the Waimea River and no further west than the plant itself. The plant capacity is 300,000 gpd and is presently operating at design capacity. Preparation of facility expansion plans was begun sometime ago but the plans have not been completed. The County presently has no plans to expand the service area.

As such, a project of this magnitude requires its own wastewater collection system, treatment plant and effluent disposal system. The collection system includes four wastewater pumping stations to deliver the raw sewage to the treatment plant. As no municipal wastewater treatment plant is available in the area, a new plant is proposed, which will treat the sewage to a minimum of R-2 quality, per State of Hawaii Department of Health standards. The treated effluent will then be used for irrigation purposes, on or near the project site. The ultimate irrigation use will be a significant factor in determining the level of treatment of the wastewater.

Electrical, telephone and cable television utilities are readily available on existing overhead lines on Kaunuali'i Highway on the mauka boundary of the property. Riser poles will route these facilities underground to serve the proposed entirely underground system.

Generation of solid waste by the project shall be minimized by implementation of aggressive recycling programs, to help lessen the impacts on the County of Kauai's available landfill capacity.

Site development work for the project will require County of Kauai grading permits, as well as County review of the drainage analysis and building protection precautions. Other potential permits include a Department of the Army permit, from the U.S. Army Corps of Engineers for the bridge crossings of the stream, State Health Department permits, Clean Water Act permit, a National Pollutant Discharge Elimination System (NPDES) permit, also a stream alteration permit from the State Department of Land and Natural Resources.

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Flood Hazard Areas

According to the Flood Insurance Rate Map (FIRM) for Kauai County, Hawaii, Panel 160 of 225 (March 4, 1987), a portion of the site, varying in width from three hundred to six hundred feet wide along the shore, lies within Special Flood Hazard Area Zone AE (Elevation 11). All structures within the Special Flood Hazard Area must be elevated above 11 feet MSL. The flood hazard areas are illustrated on Figure 2.

Off-Site Drainage

Three off-site drainage basins are tributary to the project. According to the United States Geological Survey Map, Hanapepe and Waimea Canyon Quadrangles, they are, from west to east, the Nonopahu Ridge drainage basin (830 acres), the Waipao Valley drainage basin (4,617 acres), and the Aakukui Valley drainage basin (3,107 acres). All three drainage courses drain under Kaunualii Highway to the project site, and into Hoanuanu Bay. See Figure 1 for an illustration of these drainage basins.

Nonopahu Ridge Drainage Basin

In the 100-year storm event, the Nonopahu Ridge drainage basin generates a peak flow of 1,578 cubic feet per second (cfs). Storm water from the drainage basin sheet flows makai and is also collected in a manmade ditch found in the plantation's Akia field system. Two existing 36" culverts convey runoff under Kaunualii Highway to the project site. The culverts do not have the capacity to accommodate the 100-year storm event, so the highway may be overtopped during the 100-year storm event or flows back up and drain to other outlets under the highway.

Makai of the highway, the manmade ditch continues, conveying runoff and sugarcane irrigation filter discharge from the 36" culvert towards the ocean to a 'bog' area near the shore. The bog area is used as a settling basin by the plantation for the runoff and irrigation water. Development of the Kapalawai Master Plan will require that a drainage course be provided to safely convey runoff from major storm events without adversely impacting the development. A six foot deep trapezoidal grass channel, bottom width of thirty feet and overall top width of fifty-four feet, will accommodate the 100-year storm with two feet of freeboard. The new channel will route runoff through the west portion of the project and outlet into a retention basin in the vicinity of the "bog" area which will allow for sediment collection and controlled release to the sea.

Gay & Robinson Inc. is presently constructing a new retention basin within the Nonopahu drainage basin mauka of the highway for collection of silt and runoff. Collected runoff will then be pumped for irrigation of mauka lands. The basin capacity is approximately 3.4 acre - feet, which will only have a minimal impact on the peak discharge during a major storm, but will assist in silt and sediment control. Additionally, the retention basin will control minor storm and irrigation discharges from reaching the project site.

Waipao Valley Drainage Basin

In the 100-year storm event, the Waipao Valley drainage basin generates a peak flow of 5,491 cubic feet per second (cfs). The Waipao Valley drainage basin concentrates into Mahaikona Stream and is conveyed under an overpass on Kaunualii Highway, and then into a well defined, rock wall reinforced drainage channel all the way to the ocean. The existing stream is approximately thirty-six feet wide, three to four feet deep, and clear of flow obstructions. However, in the 100-year storm event, the stream will flood, and structures within the 100-year flood fringe must be elevated above the base flood elevation.

The water surface elevation immediately makai of the highway will be approximately 13' MSL, dropping soon to 12' MSL. From there in the makai direction, the Zone AE Special Flood Hazard Area at 11' MSL controls the regulatory water surface elevation.

Aakukui Valley Drainage Basin

In the 100-year storm event, the Aakukui Valley drainage basin generates a peak flow of 3,794 cubic feet per second (cfs). The Aakukui Valley drainage basin watercourse is conveyed under an overpass on Kaunualii Highway, and then into a drainage channel all the way to the ocean. The existing watercourse is approximately twelve feet wide, two to three feet deep, and overgrown in places. In the 100-year storm event, the watercourse will flood, and structures within the 100-year flood fringe must be elevated above the base flood elevation. The water surface elevation at the highway is dictated by the backwater effect of the Special Flood Hazard Area Zone AE along the shore at 11' MSL. All structures within the Aakukui Stream flood fringe makai of the highway must be elevated above elevation 11' MSL.

Construction within Flood Hazard Areas

Structures constructed within the flood fringe of the Waipao Valley watercourse must be elevated such that the lowest supporting member of the lowest floor is at or above the 100-year storm event water surface elevation. Structures within the flood fringe must have the lowest floor elevated to, or above the 100-year storm event water surface elevation. All structures constructed within flood hazard areas must also comply with all the requirements of Section 15-1, Flood Plain Management, of the Kauai County Code. The flood hazard areas affecting the project are illustrated on Figure 2.

On-Site Drainage

Aside from the three existing watercourses from Waipao Valley, Aakukui Valley and the ditch from Nonopahu Ridge which traverse the project site, the remainder of the site

Kapalawai Master Plan

Drainage

slopes from the highway to the ocean at approximately four percent immediately makai of the highway, to approximately one percent at the shoreline. The natural sheet flow drainage pattern has a minimum erosive effect on the site.

Peak flow runoff for a 100-year storm event from the site will increase from approximately 310 cfs in the undeveloped condition, to 589 cfs in the developed condition. The increase of 279 cfs in the 100-year storm event is insignificant when compared to the total offsite flow of 10,863 cfs from the three mauka watersheds which are tributary to the property.

It should be noted that the spring-fed fishpond proposed for the project is not a significant factor in the drainage of the property. Land immediately upstream of the fishpond will sheet flow into the pond, and the fishpond will overflow into the ocean, not into one of the existing drainage courses. During a significant storm event, the fishpond will be inundated.

Drainage systems are proposed in certain areas to control flooding of access roads and parking areas. Drainway 'A' (the proposed grass-lined channel) will outlet to a retention area near the west boundary of the project at the shore. Drain line 'B', a storm drain system, will outlet into Drainway 'A'. Drain line 'C', a storm drain system, will outlet into an open lawn area downstream of the fishpond. Drain line 'D', a storm drain system, will outlet into the Mahaikona Stream flood fringe area. The remainder of the site shall be graded to approximate the existing condition, to promote sheet flow runoff from the property. The proposed drainage systems are illustrated on Figure 2.

Proper and regular maintenance of the existing streambeds and the proposed grass-lined channels is essential to ensure maximum flood protection for the project. Maintenance of Aakui Stream, which is currently overgrown in some places, will significantly improve its capacity. Below is a listing of the peak discharges during 10 year, 50 year, and 100 year storm events for the various basins considered.

Drainage Basin	Q ₁₀ (cfs)	Q ₅₀ (cfs)	Q ₁₀₀ (cfs)
Nonopahu Ridge	513	1,193	1,578
Waipoo Valley	1,823	4,168	5,491
Aakui Valley	1,258	2,879	3,794
On-site (undeveloped)	94	262	310
On-site (developed)	306	532	589

TABLE 1 - PEAK RUNOFF

Kapalawai Master Plan

Wastewater

Collection System

The proposed wastewater collection system includes approximately 14,600 linear feet of gravity sewer main, 15,500 feet of sewer laterals, 4,200 linear feet of force main, 44 sewer manholes, 4 sewage pumping stations and one sewage treatment plant. Three of the pumping stations are located near the shoreline in order to receive flows from the proposed cottages and the other proposed facilities along the beach. These three pumping stations lift wastewater to the main pumping station for the project, which will lift waste to the sewage treatment plant. The proposed collection system is illustrated on Figure 3.

The four pumping stations will be equipped with backup power generation capability in the event of a power failure by the electric utility.

Proper design, operation, and maintenance of the pumping stations will assist in controlling odor problems. However, in order to prepare for the possibility of unforeseen odor problems, the stations should be designed to readily accommodate the addition of odor scrubbers, biofilters, or other appropriate odor-inhibiting appurtenances.

Sewage Treatment Plant

Wastewater flows can be estimated by considering an estimated return of potable water to the sewer system based upon certain return factors, as shown in the table below.

Land Use	No.	Use	Use Rate (GPD/Day)	Projected Water Use Yearly Average (MGD)	Return Factor	Projected Wastewater Flow Yearly Average (MGD)
Cottages	250	one	350	0.1313	50%	0.0656
Restaurants (2)	240	seats	40	0.0286	60%	0.0172
Firearm Center	2,000	sq. ft.	LS	0.0075	60%	0.0045
Shack Bar	50	seats	40	0.0030	60%	0.0018
Tennis Clubhouse	2,000	sq. ft.	LS	0.0075	60%	0.0045
Admin. (Nilege Center)	11,132	sq. ft.	200 per 1,000 sq. ft.	0.0222	60%	0.0133
Recreation Building			LS	0.0010	60%	0.0006
Car Storage			LS	0.0010	60%	0.0006
STP and Maintenance			LS	0.0020	60%	0.0012
Existing Firearm Center	0	one	400	0.0002	60%	0.0001
Totals				0.1185	0.1778	0.0590
						0.0295

TABLE 2 - PROJECTED WASTEWATER FLOWS

A proposed wastewater treatment facility must also be capable of accommodating peak diurnal flows from the development. According to the County's Maximum Rate of Flow Chart, by Babbitt, a peaking factor of 5.0 should be applied to the peak season flow of 0.1020 MGD, for a peak flow of 0.51 MGD.

Estimates for wastewater flow must also include infiltration. A common limit for an acceptable level of infiltration in a sewer system is approximately 500 gallons per day per

Kapalawai Master Plan

Wastewater

inch-mile of pipe. As shown in the table below, this results in an estimated infiltration rate of 20,000 gallons per day, or 0.02 MGD. The treatment plant must therefore be sized for an average flow of approximately 0.12 MGD, and a peak flow of 0.53 MGD.

Pipe Diameter (inches)	Total Length of Pipe (feet)	Infiltration (gallons per day)
6	15,480	6,785
8	14,800	11,061
		19,856

TABLE 3 - ESTIMATED INFILTRATION

Treatment of the wastewater to the R-1 level according to State of Hawaii Department of Health Standards would ensure the greatest facility in reuse of the effluent after treatment. However, treatment to R-2 levels would also provide satisfactory treatment and allow for certain options in effluent reuse.

Disposal

A sewage treatment plant produces a solid product (sludge, or biosolids), and a liquid product (effluent) for disposal or reuse.

Biosolids

The biosolids can be safely disposed of at the County's Kekaha Municipal Landfill, as the County does with the biosolids from its own wastewater treatment plants. The biosolids must pass a 'Paint Filter Test' at the landfill to ensure that it is sufficiently dewatered prior to disposal.

The biosolids can also be used in a small on-site composting operation. Combined with greenwaste generated from landscaping maintenance operations on the project, compost could then be reused to enhance the development's landscaping.

Effluent

Options for disposal of the effluent include ocean outfall, injection well, rapid infiltration and irrigation. The best possible use of the effluent, especially on the west side of Kauai where weather is hot and dry and water is a precious resource, is to reuse the effluent by irrigation. Therefore, the method of choice for disposal at Kapalawai will be irrigation.

The 3.5 acre orchard adjacent to the treatment plant provides an opportunity for disposal of the effluent by drip or spray irrigation. In order to dispose of the average flow of 0.1 MGD, approximately one inch of water per day must be irrigated over a 3.5 acre area. If the effluent will be treated to the R-1 level, it may be used to spray irrigate other areas around the development with few restrictions, whereas R-2 quality effluent could be used for drip irrigation.

Kapalawai Master Plan

Solid Waste

The County of Kauai's only municipal solid waste landfill is located in Kekaha, approximately seven miles to the west. The landfills capacity and life span was severely shortened after receiving waste from Hurricane Iniki in 1992. At present, the landfill has about 5 1/2 years of capacity remaining. The Kapalawai development will implement aggressive recycling programs to minimize its impact on the County's diminishing landfill capacity.

Based upon other resorts in the state, a project the size of the Kapalawai development can be expected to generate seventy to ninety cubic yards of waste per week. Much of this waste is recyclable, as follows (on a weekly basis):

Item	RECYCLABLE WASTE Source	Approximate Weekly Volume
Cardboard	Delivery of packaged goods, miscellaneous	5 to 10 cubic yards
Glass	Food storage containers from restaurants, miscellaneous	3 cubic yards
Aluminum cans, Paper	Beverage containers, miscellaneous Administration and registration offices, miscellaneous	1 cubic yard 1 cubic yard

TABLE 4 - RECYCLABLE SOLID WASTE

Garden Island Disposal is the only commercial solid waste hauler on the island. Garden Island also has contracted with the County of Kauai to handle recycling of the above materials. The key to any successful recycling program is maintaining a clean, uncontaminated waste stream. The Kapalawai project should be able to recycle approximately 15% of its solid waste, as indicated above.

In addition, the following items may be diverted from the landfill:

Plastic:

Currently, only number 2 plastics are recyclable on Kauai. Though not a significant portion of the waste stream, recycling of plastic fits in well as part of a larger recycling program, and may grow to include other types of plastic in the future.

Food Waste:

Restaurant food waste can be composted on-site and reused in project landscaping.

Greenwaste:

The volume of greenwaste generated from landscape maintenance can be significant. The greenwaste can be composted on site, or delivered to the Kekaha landfill where the County already has a greenwaste program in operation.

Kapalawai Master Plan

References

Electric, telephone and cable television service from Kauai Electric, OTE Hawaiian Tel and Garden Isle Telecommunications are readily available on overhead lines on Kaunualii Highway.

Services will be brought underground from one or more of the several utility poles fronting the project, and looped through the development to serve the various buildings. High voltage primary electric service will be extended to several different points within the project and transformed for service to the various buildings. The cottages are to be serviced with power only and telephone and cable service will be extended to common area such as the restaurant and other guest service areas. The proposed underground service is illustrated on Figure 4.

Kapalawai Master Plan

References

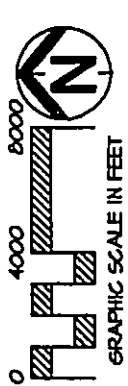
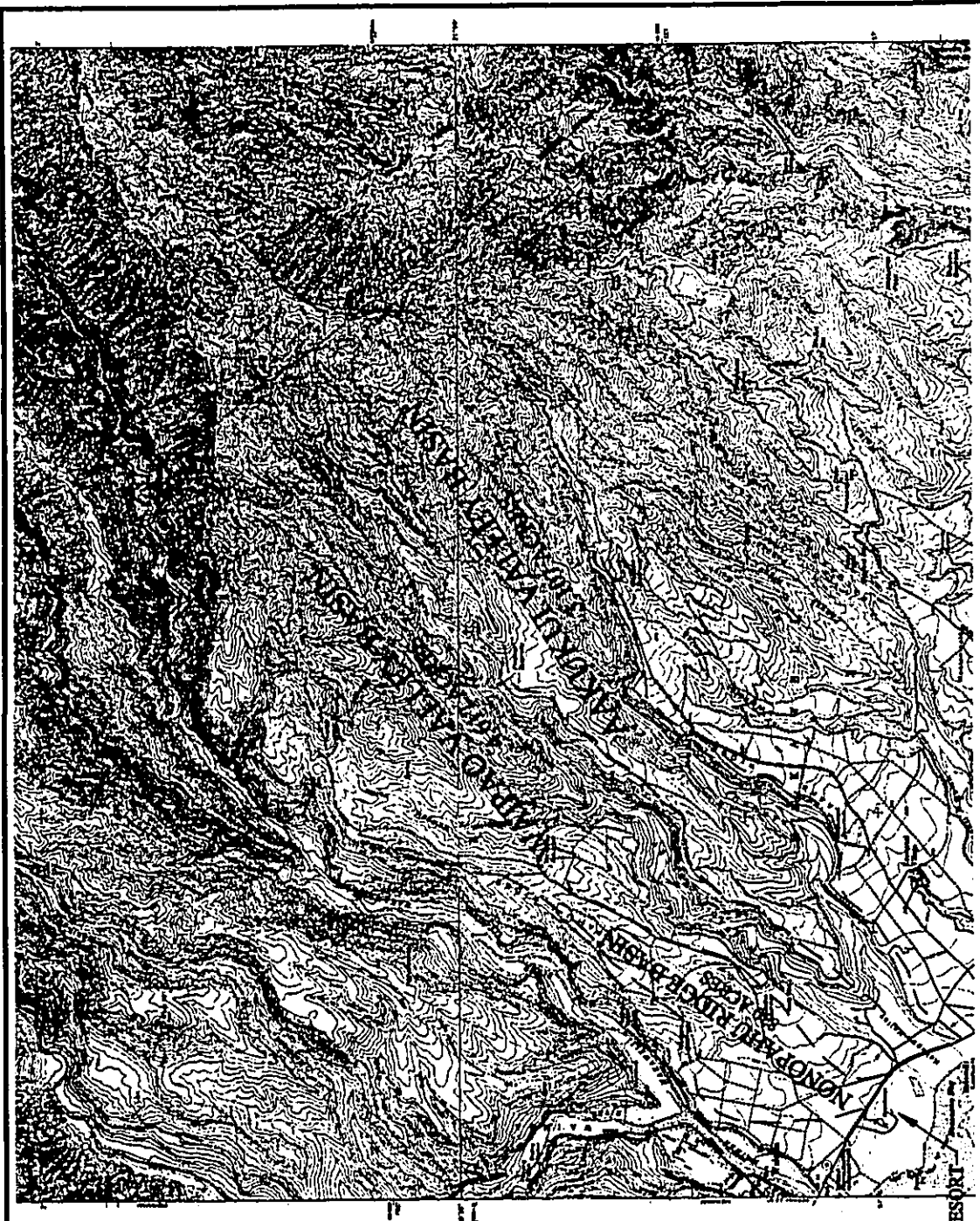
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 2. Manual of Septic-Tank Practices, U.S. Department of Health, Education and Welfare, 1972
 3. Potable Water and Irrigation Systems to Supply the Kapalawai Resort, Island of Kauai, Hawaii, Tom Nance Water Resource Engineering, March, 1999
 4. Sewer Design Standards, Department of Public Works, County of Kauai, June, 1973
 5. Storm Drainage Standards, Department of Public Works, County of Kauai, February, 1972
 6. Kauai County Code, 1987
 7. Erosion and Sediment Control, Guide for Hawaii, Soil Conservation Service, 1981.
- Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, Soil Conservation Service, 1972.

Storm Drainage			
Item	Quantity	Unit	Cost
grass swale	2,500	lf	\$20
18" storm drain	1,100	lf	\$40
24" storm drain	800	lf	\$55
30" storm drain	500	lf	\$60
36" storm drain	300	lf	\$70
42" storm drain	300	lf	\$80
change in elevation	15	ea	\$2,000
drainage structure	7	ea	\$10,000
storm drain total:			\$23,000

Wastewater System			
Item	Quantity	Unit	Cost
8" sewer	15,400	lf	\$25
8" sewer	14,000	lf	\$35
8" force main	4,200	lf	\$30
sewer manhole	44	ea	\$7,500
sewage pumping station	4	ea	\$75,000
sewage treatment plant	1	ls	\$600,000
composting facility	1	ls	\$100,000
effluent irrigation system	1	ls	\$100,000
wastewater total:			\$2,654,000

Electrical, Telephony, Cable Television (Fiber Optic Only)			
Item	Quantity	Unit	Cost
conduit-NE, HT, CATV	8,600	lf	\$5
conduit-NE for Outages	19,700	lf	\$2
pullboxes-NE, HT, CATV	28	ea	\$2,000
pullboxes-NE	40	ea	\$750
transformers-NE	24	ea	\$2,200
branch	28,300	lf	\$4
electrical, telephony, cable tv total:			\$334,400

Roadways & Parking			
Item	Quantity	Unit	Cost
pavement	300,000	sf	\$2
bridge	1	ea	\$100,000
finish grading	400,000	sf	\$0.20
roadways total:			\$780,000
subtotal:			\$4,097,400
contingency			10% \$409,740
total:			\$4,507,140

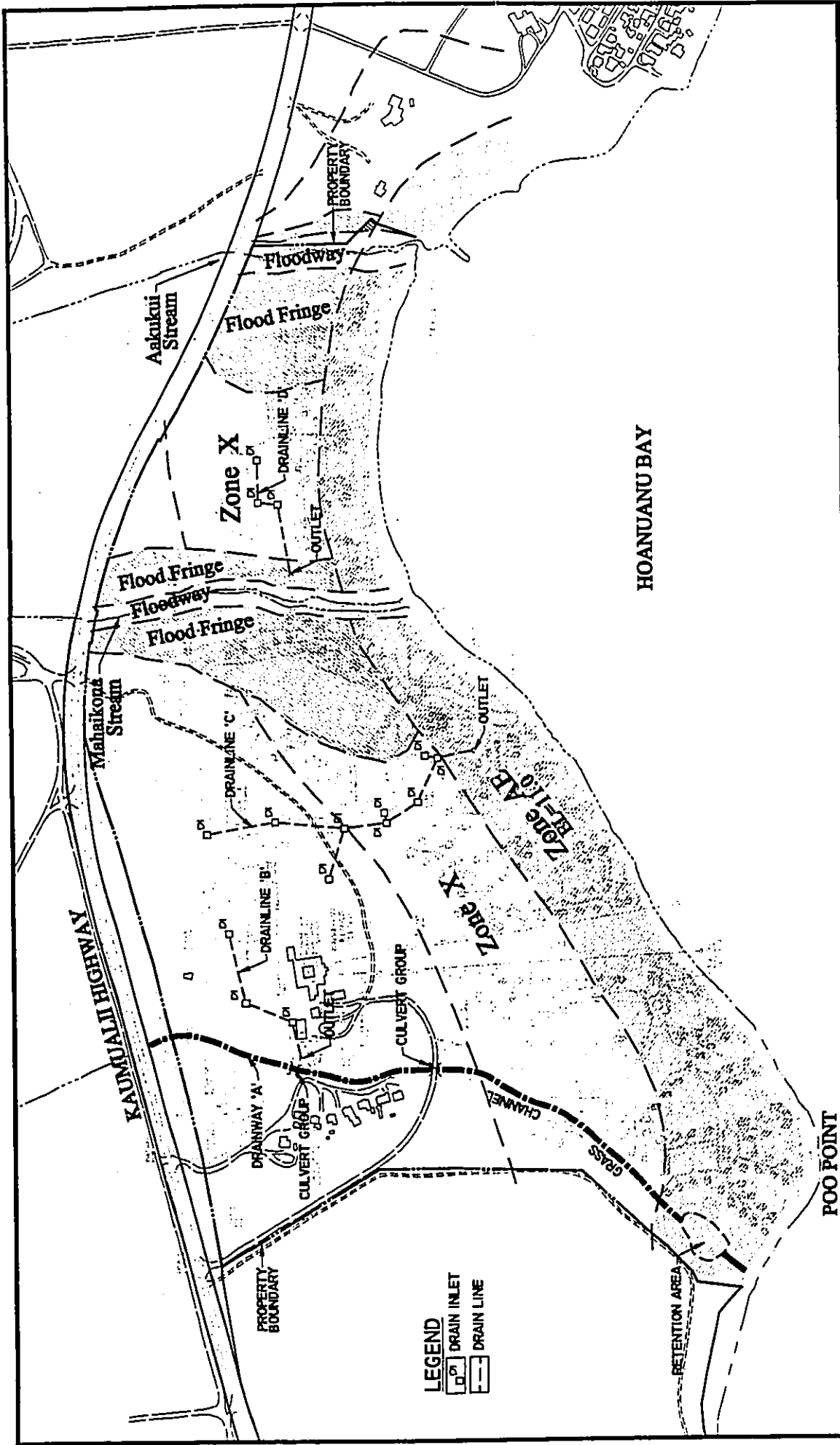


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KAPALAWAI RESORT
OFFSITE DRAINAGE BASINS
 KAPALAWAI, MAKAWELI, KAUAI, HAWAII

 **Wagner Engineering Services, Inc.**
 P.O. Box 851 Hanalei, HI 96714 (808) 828-7229

Figure 1 9



LEGEND
 □ DRAIN INLET
 — DRAIN LINE

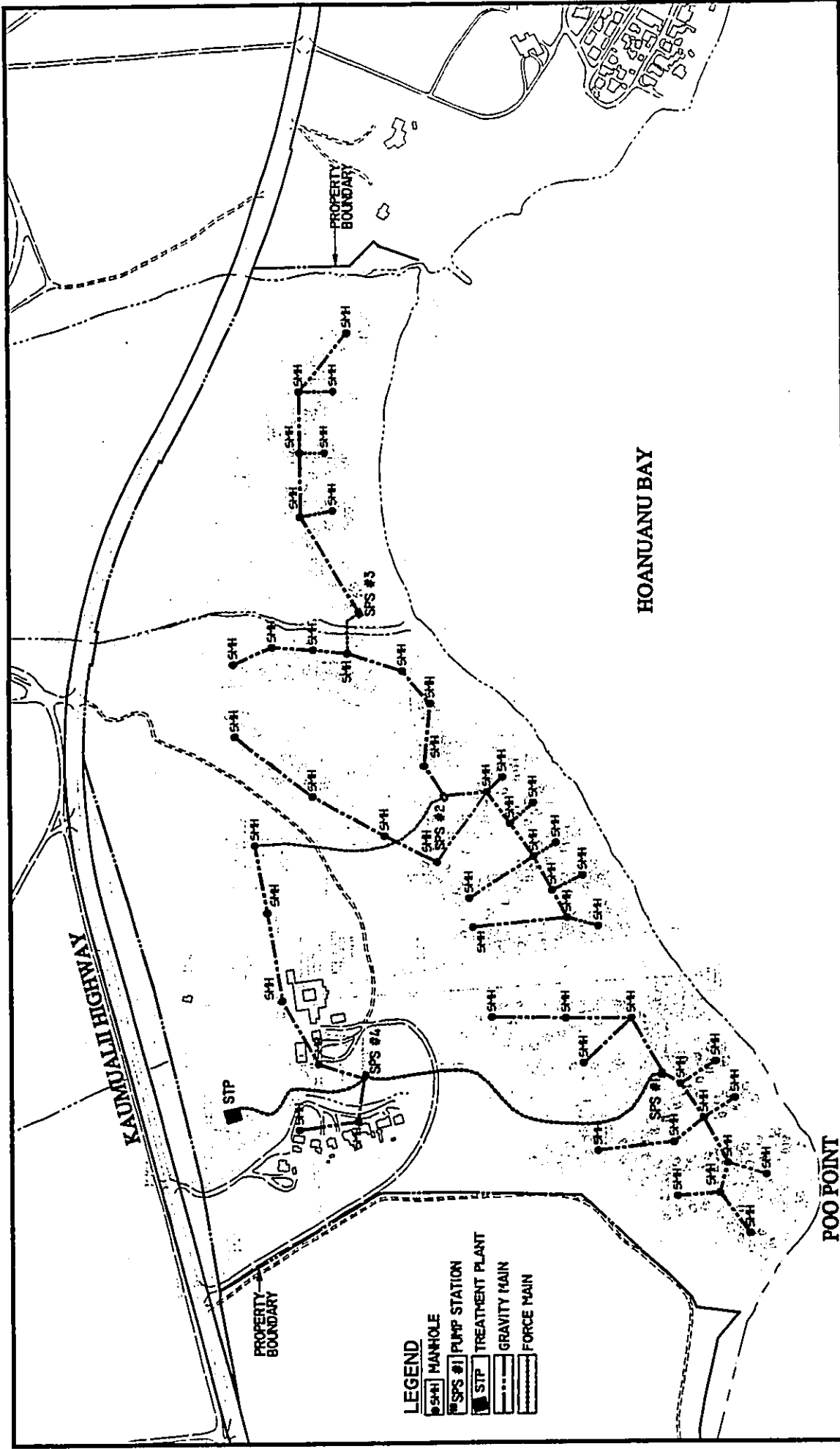
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DATE:	9/27/99

KAPALAWAI RESORT
PRELIMINARY DRAINAGE PLAN
 KAPALAWAI, MAKAWALI, KAUAI, HAWAII

Wagner Engineering Services, Inc.
 P.O. Box 681 Hanalei, HI 96714 (808) 828-7288



Figure 2 10

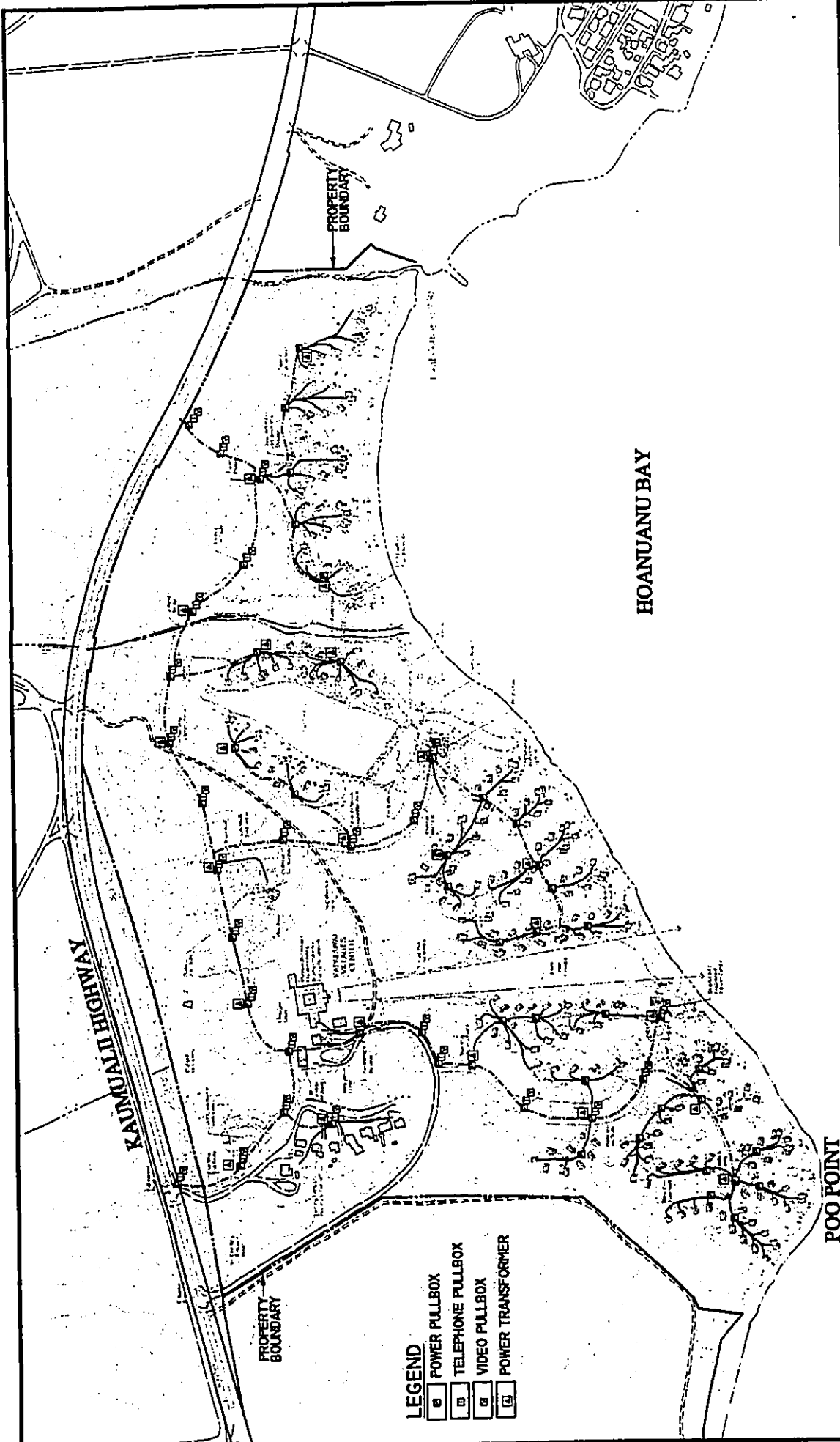


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DATE:	9/27/99

KAPALAWAI RESORT
PRELIMINARY WASTEWATER SYSTEM PLAN
 KAPALAWAI, MAKAWALI, KAUI, HAWAII


Wagner Engineering Services, Inc.
 P.O. Box 651 Hanalei, HI 96714 (808) 828-7259

Figure 3 11



SCALE: H: 1"=400'
V: N/A

TM: RW, BH

DATE: 9/21/99

KAPALAWAI RESORT
PRELIMINARY UNDERGROUND UTILITY PLAN
 KAPALAWAI, MAKAWELI, KAUAI, HAWAII

Wagner Engineering Services, Inc.
 P.O. Box 851 Hanalei, HI 96714 (808) 828-7287

Figure 4 12



J

POTABLE WATER
AND IRRIGATION SYSTEMS
TOM NANCE
WATER RESOURCE ENGINEERING

**Potable Water and Irrigation Systems
to Supply the Kapalawai Resort,
Island of Kauai, Hawaii**

Prepared for:

Heiber Hastert & Fee
Grosvenor Center - P.R.I. Tower
733 Bishop Street - Suite 2590
Honolulu, Hawaii 96813

Prepared by:

Tom Nance Water Resource Engineering
680 Ala Moana Boulevard - Suite 406
Honolulu, Hawaii 96813

March 1999

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Introduction

This brief report describes the potable water and irrigation systems that would be developed to supply the Kapalawai Resort on the southwest shoreline of the Island of Kauai. Both of these systems will be privately developed and operated because service from the Kauai Department of Water (DOW) is not available in this area. DOW's Waimea system ends at the Waimea River, 0.8 miles west of Kapalawai. It does not have sufficient source capacity if its pipelines were extended to the project site. DOW's system serving the Hanapepe area ends four miles to the east of Kapalawai.

The choice to develop a dual (potable and irrigation) water system will take advantage of the supply potential of the five-acre, spring-fed pond which exists in the center of the project site. Drawing water from this lake will augment its natural turnover rate, improving its water clarity while providing irrigation supply. It also allows elements of the potable system to be downsized accordingly.

Projected Water Use

Table 1 is a compilation of projected potable water use for the project. Use rates for this projection are generally in accord with DOW standards. The project's year-round average potable water use is projected to be approximately 0.12 million gallons per day (MGD). Peak seasonal use may be about 50 percent greater or approximately 0.18 MGD.

The areas to be irrigated by the non-potable system are listed in Table 2. Year-round and peak season evapotranspiration rates of landscaping have been estimated from the rainfall and evaporation data of nearby Station 962.00 (Olokele Sugar Company's Field 30) with an additional 10 percent allowance for application inefficiencies. Kapalawai is a generally dry area with about 25 inches of rain annually. Its rate of evaporation often exceeds 10 inches in summer months and 90 inches annually (Table 3). Based on these data, irrigation application rates in the summertime may be as high as 10,200 gallons per day per acre. Year-round irrigation use for the project is estimated to be 0.36 MGD. In the summer months, the rate could be as high as 0.66 MGD.

Hydro-Geologic Conditions

The project area lies on a wedge of coastal sediments which are comprised of alluvium of the inland side and grade into beach sands on the coastal side. On the mauka side of the highway, most of the land is covered by the island's later stage Koloa volcanics. However, there are outcrops of the

Table 1
Projected Potable Water Requirements of the Kapalawai Resort

Land Use	No.	Unit	Use Rate (GFD/Unit)	Projected Water Use	
				Year-Round Average (MGD)	Peak Season (MGD)
Cottages	250	Ea	350	0.0875	0.1312
Restaurants (2)	240	Seats	40	0.0096	0.0144
Fitness Center	2,000	Ft ²	LS	0.0050	0.0075
Snack Bar	50	Seats	40	0.0020	0.0030
Tennis Clubhouse	2,000	Ft ²	LS	0.0050	0.0075
Admin (Villages Center)	11,132	Ft ²	200/1000 ft ²	0.0022	0.0033
Registration Building	--	--	LS	0.0010	0.0015
Car Storage	--	--	LS	0.0010	0.0015
STP and Maintenance	--	--	LS	0.0020	0.0030
Existing Plantation Homes	8	Ea.	400	0.0032	0.0048
Total				0.1195	0.1777

Table 2
Projected Irrigation Supply Requirements
for the Kapalawai Resort

Land Use	Irrigated Area (Acres)	Required Supply	
		Average (MGD)	Peak Season (MGD)
Roadways	5.9	0.0329	0.0602
Orchard	3.5	0.0195	0.0357
Villages Center	9.2	0.0513	0.0938
Plantation Houses	3.2	0.0178	0.0326
Cottages	42.5	0.2369	0.4335
Total	64.3	0.3585	0.6559

Note: Applied rates are the irrigation deficit, as defined in Table 3, increased by 10% for application inefficiencies. These are equivalent to 5575 and 10,200 GPD/acre for year-round average and the peak season.

Table 3
Rainfall and Pan Evaporation From Station 962.00
(Field 30 of Olokele Sugar Company)

Month	Long-Term Average			Dry Year - 1970		
	Rainfall (Inches)	Evaporation (Inches)	Irrigation Deficit (Inches)	Rainfall (Inches)	Evaporation (Inches)	Irrigation Deficit (Inches)
January	4.72	5.22	0.00	5.46	5.08	0.00
February	2.80	5.30	2.50	0.74	5.52	4.78
March	2.60	7.03	4.43	0.08	8.32	8.24
April	1.77	7.77	6.00	0.22	9.73	9.51
May	1.10	6.96	7.86	2.06	10.11	8.05
June	0.47	9.40	8.93	0.00	10.46	10.46
July	0.51	9.68	9.17	0.44	10.49	10.05
August	0.91	9.50	8.59	0.00	10.65	10.65
September	0.94	8.24	7.30	0.87	8.43	7.56
October	2.44	7.71	5.27	2.23	7.46	5.23
November	2.56	6.16	3.60	2.84	5.18	2.34
December	4.09	5.50	1.41	0.69	6.91	6.22
Annual	24.80	92.94	68.14	15.39	98.34	82.57

- Notes:
1. Pan evaporation data for Station 962.00 taken from Ekem & Chang (1965).
 2. Adjusted long-term average rainfall taken from Giambelluca, Nullet, & Schroeder, 1986.
 3. Rainfall for Station 962.00 in 1970 obtained from unpublished data in the files of the State Water Commission.

older Makaweli formation (as mapped in MacDonald, Davis, & Cox, 1968) which are directly inland from the project site and also comprise the ridge which separates the Waipao and Akukui Valleys. These outcrops suggest that the more recent Koba lavas in this area are likely to be a relatively thin cover over the older lava formation. Based on changes in ground slope and water quality data from the spring-fed pond discussed subsequently, the seaward limit of the Koloas in this location may actually end somewhere beneath the project site rather than extend to and beyond the shoreline.

The five-acre, spring-fed pond on the project site is an interesting feature. Although it is now almost half filled with silt and is heavily overgrown by vegetation, there are two discrete springs which are easily identified by water quality and temperature contrasts. By these same indications, there are also other springs in the pond which are more difficult to specifically locate. One of the two easily identifiable springs is at the inland end of the pond (Site 1 on Figure 1). Its water is relatively warm (72.0° F), has a notably high silica concentration, and has a salinity as low as many sources of drinking water (Table 4). This water is likely to be discharging from the Koloa formation, possibly at its seaward end.

As this water moves across the pond, its salinity becomes slightly elevated and there is some dilution of its silica concentration (Sites 2 and 3 on Figure 1 and in Table 4). The second identifiable spring is in a hydraulically separate arm of the pond which is much closer to the shoreline (Site 4 on Figure 1). Water issuing from the bottom of this makai portion of the pond is much colder (67.5° F), has only about half the silica concentration, and is lower in nitrogen and phosphorus. The temperature and silica differences suggest that the two identifiable springs are discharging from different aquifers. Water from the makai spring may be derived from the older Makaweli volcanics at depth and its nutrient levels may be altered by passage through the coastal sediments into the pond.

Figure 2 presents the recorded water level variation in the pond at three different locations: at the upper (mauka) end of the main pond; at the makai end of the main pond and about 80 feet away from the rectangular culvert which connects to the makai pond; and in the makai pond, about 100 feet downstream of the connecting culvert. These water levels are about five feet above mean sea level. At all three sites, there is a level fluctuation in response to the ocean tide, with slightly less amplitude and greater lag time at the upper end of the main pond.

The connecting culvert has provisions for the installation of a gate to isolate the two ponds, although the actual gate is no longer in place. Based on numerous observations, there is a continuous mauka-to-makai movement of water through the culvert. Using a Pycnomy propeller-type velocity meter

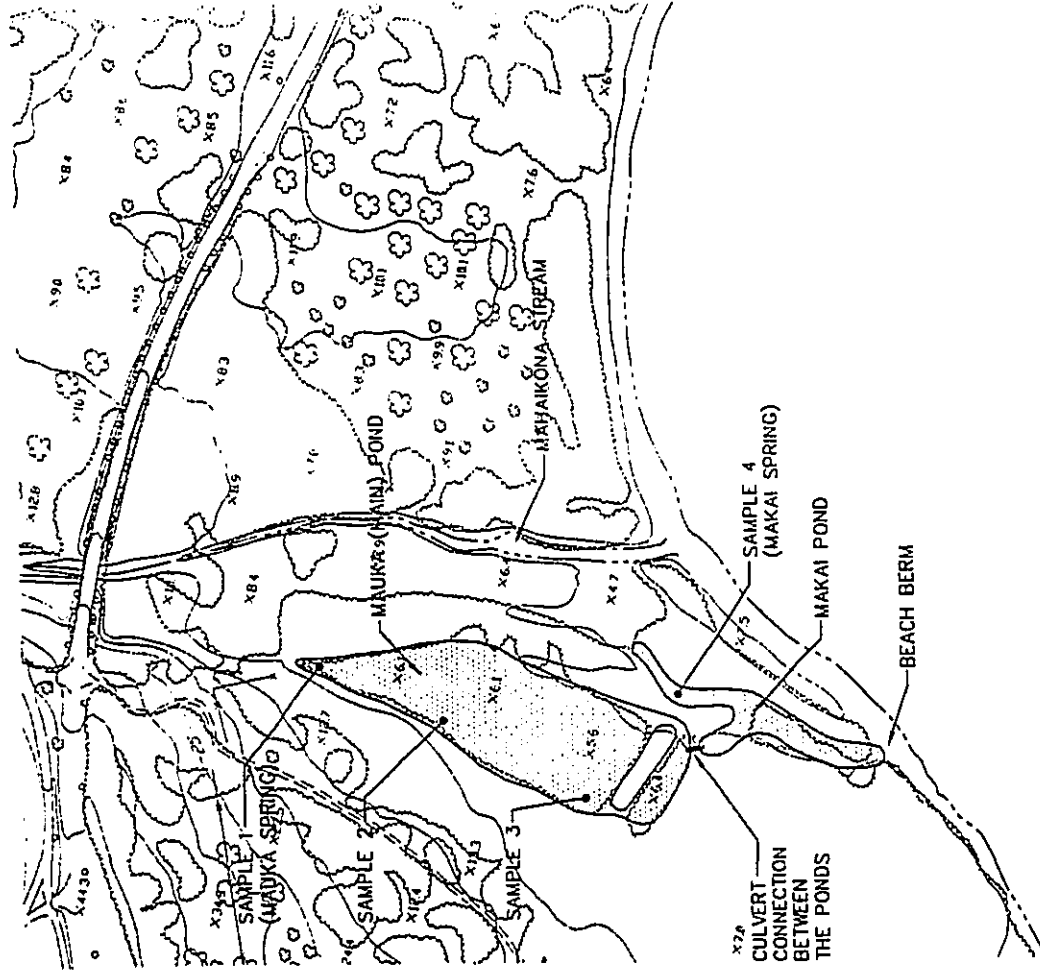
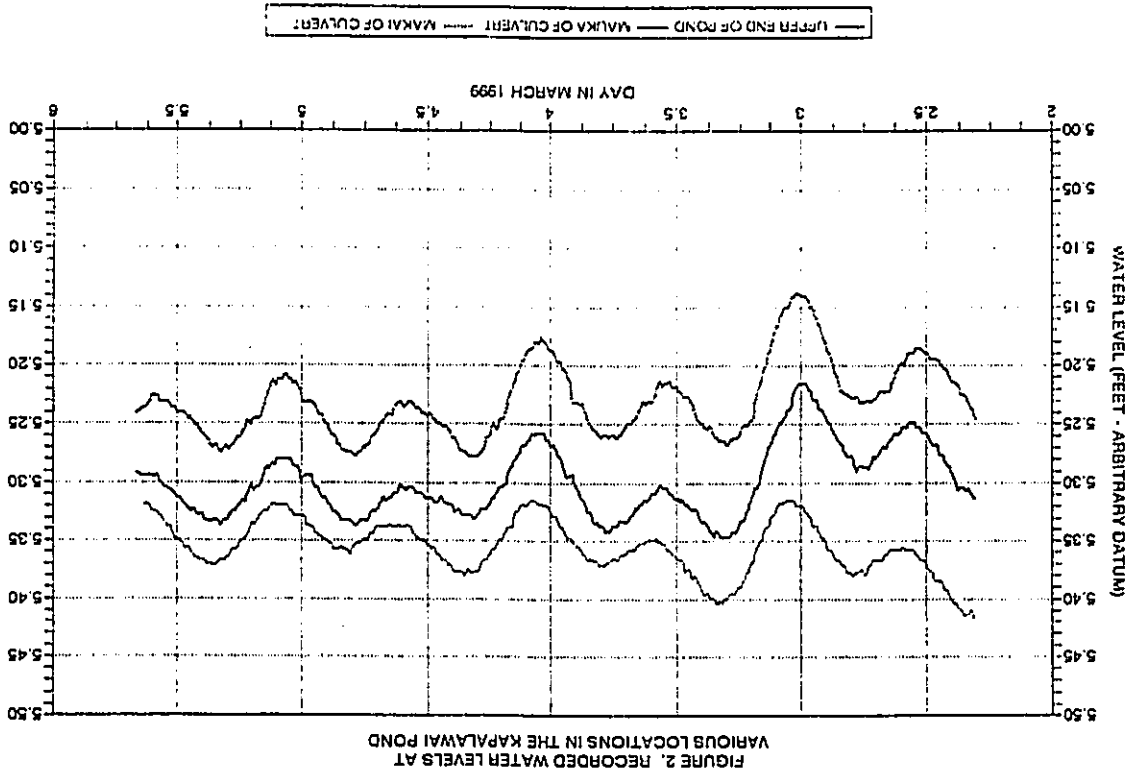


FIGURE 1
WATER QUALITY SAMPLING SITES
AT THE KAPALAWAI POND

Table 4
Water Quality at Selected Locations of the
Five-Acre, Spring-Fed Pond

Constituent	Units	Sampling Site			
		1	2	3	4
In-Situ Temperature	° F	72.0	72.7	72.6	67.5
Chlorides	MG/L	90	191	244	220
Salinity	PPT	0.324	0.438	0.690	0.518
Silica (as SiO ₂)	MG/L	55	55	51	29
Nitrate (as N)	MG/L	2.11	2.35	1.24	0.03
Ammonium (as N)	MG/L	0.02	0.02	0.02	0.19
Dissolved Organic Nitrogen	MG/L	0.16	0.19	0.27	0.44
Total Nitrogen	MG/L	2.29	2.56	1.54	0.66
Phosphate (as P)	MG/L	0.14	0.16	0.11	0.06
Dissolved Organic Phosphorus	MG/L	0.02	0.02	0.02	0.03
Total Phosphorus	MG/L	0.16	0.18	0.13	0.09

Note: Samples collected by TNWRE on December 18, 1998 and analyzed by Marine Analytical Specialists.



and the culvert's dimensions, this discharge rate was measured to be 1.8±0.1 MGD on both falling (March 1, 1999 at 8:00 a.m.) and rising (March 5, 1999 at 4:00 p.m.) tides. These measurements approximate the net discharge rate of springs in the larger, mauka pond. This flow combines with spring flow in the makai pond and discharges through the wave-built beach berm at the seaward end of the makai pond. Despite the significant magnitude of this flowrate, no leakage through the berm is visible or detectable as a change in nearshore salinity, even at low tide.

No wells have been drilled upgradient of the project site where supply for the potable system will have to be developed. Based on the surficial geology, the well would be started in Koloa lavas but is likely to reach the older, Makaweli formation of the Waimea series lavas before reaching sea level. As such, groundwater in this lower formation would be the source of supply for the potable system.

Elements of the Potable Water System

Sizing criteria for all elements of the potable water system conform to DOW's standards. The most important of these are as follows:

- Well pumping capacity will provide the maximum daily use in a 16-hour pumping period. Based on the projections in Table 1, this translates to a minimum well pump capacity of 185 gallons per minute (GPM).
- The potable system will provide fire protection, so the following two criteria are applied for reservoir storage: (1) the volume must be equivalent to the maximum daily use without credit for inflow from the well pump; and (2) the volume must provide the maximum day rate plus fire flow for the duration of the fire with the reservoir 3/4 full at the start and credit for well inflow. The maximum daily use is 0.177 million gallons (MG). Based on RFR-10 zoning, fire flow requirement is 1500 GPM for two hours. This translates to a storage requirement of 172,550 gallons. A nominal 0.20 MG storage tank is the appropriate choice using either sizing criterion.
- Pipelines are sized to deliver the peak hour flowrate at not greater than 6 feet per second velocity and with a minimum residual pressure of at least 40 psi. Pipe sizes must also be adequate to deliver the 1500 GPM fire flowrate, coincident with the maximum day flowrate, with a minimum residual pressure of 20 psi.

The potable water system meeting these design criteria is illustrated on Figure 3. A 0.20 MG storage reservoir would be located with a spillway elevation at 200 feet on the mauka side of the highway. A single 8-inch well, outfitted with a 200 GPM, 15 horsepower submersible pump, would be located next to this tank. Standby well pumping capacity would be provided with a back-up pump and motor stored in the control building onsite. If it is necessary, the well's shallow-set submersible pump could be replaced with this back-up unit in a matter of hours. The 2900-foot long, mauka-makai transmission pipeline, which would be micro-tunneled beneath the highway, would be 12-inch ductile iron. The onsite pipelines shown on Figure 3 would be 8-inch ductile iron. Smaller pipes, which would provide service to the cottages and other buildings, are not shown.

Elements of the Non-Potable Irrigation System

The heart of the irrigation system would be an automated pump station situated at the mauka end of the pond at the site of a new abandoned pump station formerly used for sugarcane irrigation (its location is shown on Figure 3). It would consist of three pumps of varying capacities, a small, pressure tank, and automated controls that operate the pumps to maintain pressure in the distribution system for a wide range of irrigation application rates. The station capacity would be able to deliver the peak seasonal use rate of 0.66 MGD in a 6-hour (11:00 p.m. to 5:00 a.m.) irrigation period, equivalent to a maximum delivery rate of about 1830 GPM. This capacity is similar to typical golf course pump station. The distribution network, which is not shown on Figure 3, would consist of PVC or HDPE pipeline and irrigation controllers. Its design would be completed after the landscape plan is finalized.

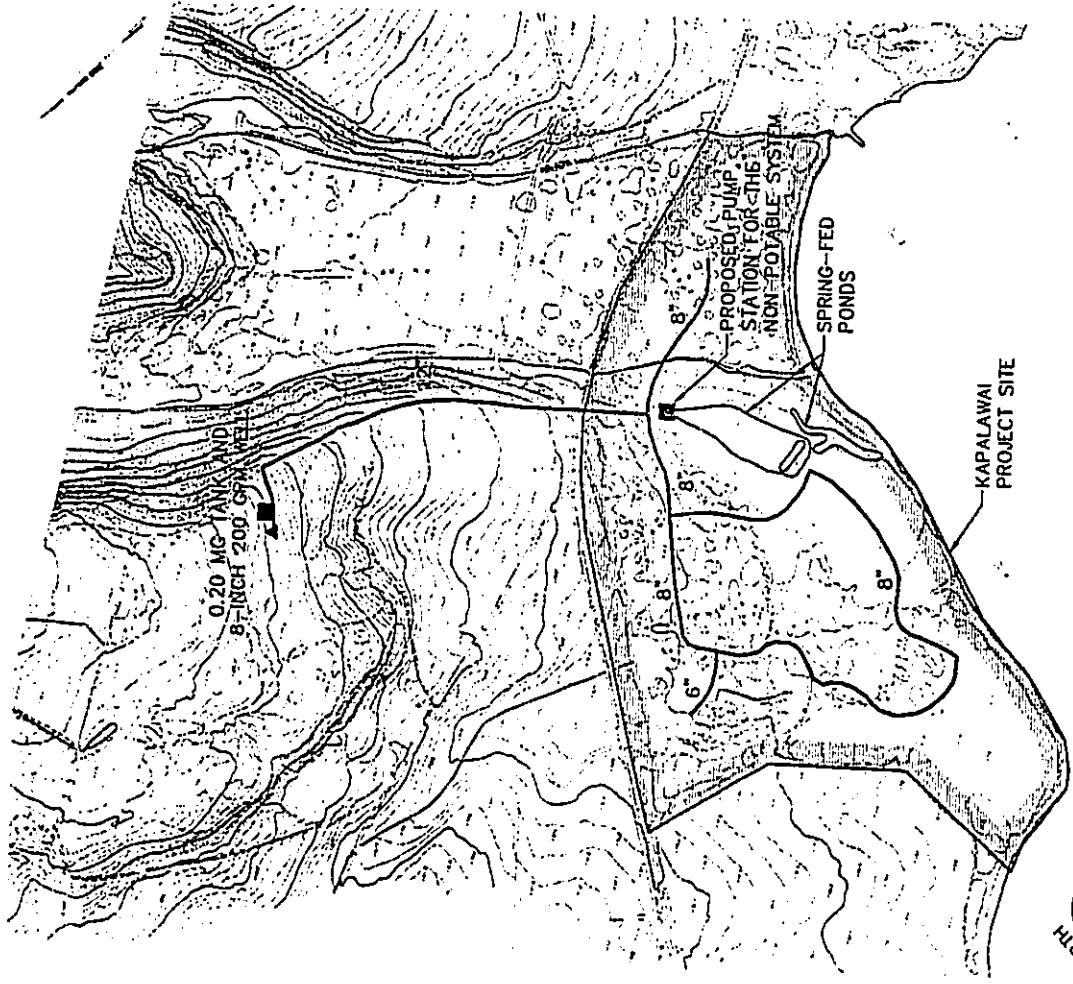
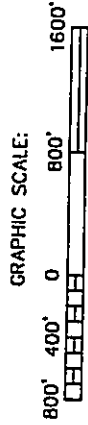


FIGURE 3
 MAIN ELEMENTS OF THE
 PROPOSED KAPALAWAI POTABLE
 & NON-POTABLE WATER SYSTEMS



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