

COUNTY OF HAWAII

# PLANNING DEPARTMENT

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ALBERT LONO LYMAN  
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'88 FEB 11 10:45 AM  
TIM LUI-KWAN  
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DEC 22 1988  
QUALITY CONTROL

February 4, 1988

Ms. Ann L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

Final EIS - South Kohala Resort  
Determination of Acceptability

We have reviewed the final EIS for the proposed South Kohala Resort development.

Chapter 343, HRS, requirements were triggered by the filing of a Shoreline Setback Variance petition to allow the construction of shoreline improvements within the 40-foot shoreline setback area. The shoreline improvements are part of the proposed resort development.

We have determined the Final EIS to be acceptable as we find that said document has satisfied the following criteria:

1. Procedures for assessment, consultation, review and revisions required for the EIS have been complied with;
2. Content requirements for a Final EIS have been satisfied; and
3. Comments submitted during the review process have been responded to satisfactorily and have been incorporated or appended to the EIS.

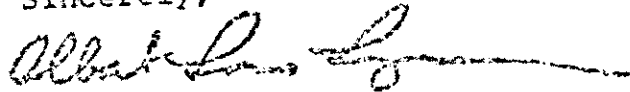
Ms. Ann L. Napes  
February 4, 1988  
Page 2

Acceptance of the Final EIS is with the understanding, however, that the unresolved issues as is outlined in the Final EIS, Pages I-8 and I-9 and Chapter IX, are to be resolved in the context of subsequent regulatory approvals.

We note that should there be major changes to the proposed project from that which is described in the Final EIS, supplemental environmental impact statement may be required.

Should you have any questions, please feel free to contact our office.

Sincerely,



ALBERT LONO LYMAN  
Planning Director

AK:aeb

cc: Office of Environmental Quality Control

**FINAL  
ENVIRONMENTAL  
IMPACT  
STATEMENT**

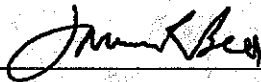
December 1987

Prepared for:  
Mauna Kea Properties, Inc.

Prepared by:  
Belt Collins & Associates

For Submission to:  
Hawaii County Planning Department

Submitted by:



James R. Bell, President  
Belt Collins & Associates  
Honolulu, Hawaii

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***SOUTH KOHALA RESORT***

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SOUTH KOHALA, ISLAND OF HAWAII

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# *CHAPTER I*

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## CHAPTER I

### INTRODUCTION AND SUMMARY

#### 1.0 PURPOSE OF THIS DOCUMENT

This environmental impact statement has been prepared to accompany an application submitted by Mauna Kea Properties, Inc. (MKP) to the County of Hawaii Planning Department requesting approval for a shoreline setback variance that would permit the construction of shoreline improvements within the 40-foot setback area. The shoreline improvements are part of the proposed development of the South Kohala Resort. This document has been prepared in compliance with the requirements of Chapter 343, Hawaii Revised Statutes, and the regulations adopted pursuant thereto.

#### 2.0 PROPOSED GOVERNMENTAL ACTION

Mauna Kea Properties, Inc. is requesting that approval be granted to allow construction of a high-quality, self-contained, low-density resort complex, including shoreline improvements which would necessitate work in the 40-foot shoreline setback area. A Special Management Area application has also been submitted for that portion of the resort seaward of Queen Kaahumanu Highway.

#### 3.0 PROJECT DESCRIPTION

Mauna Kea Properties proposes to develop its property adjacent to and south of the Mauna Kea Beach Resort in South Kohala, Hawaii. The total area of the planned South Kohala Resort amounts to about 489 acres -- 95 acres makai and 394 acres mauka of the Queen Ka'ahumanu Highway. A luxury class 350-room hotel, tennis complex, and championship 18-hole golf course and clubhouse will provide the focus for this development adjacent to the beach at Hapuna Bay. The proposed hotel will be characterized by low-profile structures from one to six stories, reaching a maximum height of 75 feet, as well as extensive landscaping. A Planned Unit Development (PUD) permit for a maximum 75 feet height for the hotel has been obtained but may have to be amended. It is proposed that the landscaping be extended into the 40-foot shoreline setback and that other improvements be made in the shoreline area to enhance the physical setting and improve public and guest safety and usage.

In addition, the resort community will include 110 single-family residential units or lots and 450 multifamily residential units. In keeping with the Mauna Kea Properties development philosophy, densities will be low (averaging 5 units per acre for multifamily sites and 2 units per acre for single-family sites). Multifamily units will be arranged in low-rise clusters surrounded with abundantly landscaped open areas. Except for ten single-family lots, the residential projects will be situated mauka of the highway. A beach club adjacent to the proposed hotel and a community recreation center in the mauka lands are planned to serve the South Kohala Resort residents.

Improvements in the public right-of-way, the resort entry off Queen Kaahumanu Highway, the underpass, and golf cart path are part of the project.

Construction of the golf course and clubhouse, beach club, and tennis complex will start in 1990 and be completed by 1992. The hotel will be constructed between 1991 and 1993. All infrastructure, as well as fifteen single-family residential units, are also scheduled for completion in 1993. During the 1994-1998 period, the remainder of the residential sites will be developed.

A preliminary estimate of construction cost for the total project is approximately \$329-million (1987 dollars).

#### **4.0 NEED FOR THE PROJECT**

A study was commissioned to determine the marketability of hotel and resort residential units and associated resort uses to be offered by the proposed South Kohala Resort. The study concluded that there will be a strong demand for such facilities through the year 2000, and that most of the demand will be satisfied in the Kohala Coast Resort Region. In terms of hotel room rates, it is likely that a disproportionate share of the future market potential will be in the luxury and super-luxury ranges.

South Kohala Resort will also provide new employment opportunities and generate economic growth in the region and the island as a whole. With the decline of the sugar industry on the Big Island, high quality developments such as South Kohala Resort will help to fill the void.

#### **5.0 SUMMARY OF IMPACTS**

##### **5.1 PHYSICAL ENVIRONMENT**

The project site has low value as agricultural land and has no recent history of agricultural use, so it will not be lost to potential agricultural development. Construction of South Kohala Resort will actually increase demand for locally grown agricultural products.

The site will be transformed by grading, importation of soil, and landscaping. No major changes to existing landforms are planned.

Development of the resort may increase runoff during severe storms. Due to low rainfall, drainageways and gulches experience only intermittent flow, but storms exceeding 100-year frequency have been known to cause damage.

##### **5.2 NEARSHORE AND MARINE ENVIRONMENT**

The proposed project will not involve any shoreline modifications, so the temporary effects of construction and permanent impacts on the nearshore and marine environment will be minimal. The potential impacts on endangered or threatened marine mammals and turtles are negligible.

Baseline surveys of the coastal waters fronting the proposed project, conducted during both summer and winter months, indicate few well-developed marine communities inhabiting the predominantly sandy bottom. Organisms are well adapted to the large natural sedimentation loads caused by sea

conditions; they will not be affected by additional input from land-based development. The impact of runoff is expected to be slight, given the extremely low rainfall.

Concerns have been raised regarding contamination of groundwater and/or offshore waters by fertilizers and pesticides applied on the golf course and landscaping. However, an analysis of water samples taken from brackish water seepage sites in Kauna'oa Bay show no movement of agricultural chemicals from the Mauna Kea Resort to shoreline waters via groundwater. Development, construction, and management of South Kohala Resort will be quite similar to those of the adjacent Mauna Kea Resort, and the physical conditions at the two sites are essentially identical. Therefore, development of South Kohala Resort is unlikely to cause contamination of Hapuna Bay or groundwater resources given that agricultural chemicals are used in accordance with established practices.

No adverse effects are anticipated from the planned use of treated sewage effluent to irrigate the golf course. Much of the nutrient load will be taken up by the golf course vegetation, so that essentially none of it will reach the marine environment through groundwater. Furthermore, unrestricted circulation in the bay would prevent any buildup of nutrient materials. Adverse impact is also unlikely because of the secondary level of sewage treatment.

It has also been concluded that the increase in the volume of groundwater extrusion, and resulting change in water chemistry along the shoreline, will also be insignificant.

### **5.3 FLORA AND FAUNA**

No significant adverse impacts relative to flora or fauna are anticipated as a result of the development. Plants observed at the site are primarily exotic species commonly found throughout Hawaii, and none are endangered or threatened plant species. A wide variety of birds, mostly exotic, inhabit the area, but no endangered species of birds or mammals have been observed on the project site.

### **5.4 HISTORIC AND ARCHAEOLOGICAL RESOURCES**

None of the sites indentified in the property mauka of the Queen Ka'ahu-manu Highway have been deemed significant. Based on the reconnaissance survey findings, archaeological remains in the makai lands appear to be, for the most part, of limited significance. Those deemed potentially significant have undergone intensive survey. Based on this intensive survey performed by Paul Rosendahl, it is believed that no additional archaeological field work of any kind is necessary or justified except for the Kaunaoa Point Complex (near the proposed beach club) and a portion of Trail 9, a coastal foot trail. These two will be preserved.

### **5.5 SOCIO-ECONOMIC CONSIDERATIONS**

The average daily visitor census at the hotel and condominium units is expected to be about 467 in 1993, and 712 in 1998. On-site resort residents will number approximately 21 in 1993, and increase as additional units are built -- up to 424 residents in 1998.

During construction, average daily on-site employment will range from a low of 27 workers during the first two years, to a high of 263 while the hotel is being built. There will also be indirect and induced employment generated off-site. The impact of construction employment will most likely be temporary.

When the hotel opens in 1993, it is expected to provide 490 full-time equivalent positions. With the construction of additional units during subsequent years, total on-site jobs at South Kohala Resort by 1998 (when build-out occurs) is estimated to reach 692. Because immigrants will be required to fill some of the positions, population will increase. Steps can be taken to limit immigration by the active recruitment and training of existing residents, as well as former residents who have left the Big Island due to the previous lack of job opportunities. Total immigration of South Kohala Resort employees and their families in 1993 is projected to be 600. An additional 100 or more immigrants are expected each subsequent year, so by 1998, the cumulative total will be 1,133.

Off-site population impacts, as well as cumulative resort development impacts, are also projected. For the completed South Kohala Resort project, the combined off-site population impact islandwide will be a little over 1,900 people, roughly 60 percent of whom would be induced or recent non-induced immigrants. By 1998, the total population impact from cumulative resort development in the region (South Kohala Resort plus all other resort development) will reach 17,000 islandwide. More than 80 percent will eventually live in West Hawaii, and 60 percent of this population will be associated with workers moving from elsewhere to fill labor shortages.

Workers new to the island and their families will need housing, and some will require assisted housing. In 1993, the demand for new housing attributable to South Kohala Resort (as a result of both resort and non-resort jobs) will be around 154 to 175 units islandwide. For the various resorts in the region proposed to open by 1993, cumulative islandwide housing impacts will range from 1,300 to 1,400 units. Extending the timeframe to 1998, the figures are 2,900 to 3,200 housing units. On-site workers are expected to initially require between 129 and 157 new housing units, and an estimated 32 to 38 of these households will not be able to afford market housing and require some form of subsidy. For subsequent years, the demand for new housing units is estimated to range from 14 to 16 units per year (with 3 or 4 households per year requiring housing assistance), resulting in a combined total of 200 to 234 units in 1998 (including 49 to 58 assisted housing units).

Besides increasing housing demand, in-migration and population growth have the potential of causing social stress. There are also certain aspects of resort development in general that have strong implications for social change, some positive and some negative.

A public revenue-cost analysis was performed for the proposed project. A favorable revenue-cost ratio of 9 to 1 is projected. This means that an additional \$9.00 of public revenue will accrue to the State or County of Hawaii for every dollar of public cost caused by the project. Revenues include general excise tax, corporate income tax, personal income tax, real property tax, and hotel room tax expected to be generated as a result of South Kohala Resort development. Public costs include those expected to be incurred



for education, health, mass transit, police, and fire services. Variables such as costs for highway construction and maintenance, airport expansion, and utilities were excluded from the analysis because these costs will ultimately be offset by revenues generated by user fees.

## **5.6 TRANSPORTATION FACILITIES**

South Kohala Resort will have an impact on the roadway system in the North Kona/South Kohala area. By itself, the project will not cause the level of service of the system to be lowered to such an extent as to require improvements to keep traffic flowing smoothly. However, the cumulative impact of all projects planned for the region, if they develop on schedule, will cause traffic conditions to deteriorate to a point where improvements would be required. It is anticipated that the following roadways and intersections will be most affected: Queen Ka'ahumanu Highway, from Kailua-Kona to Keahole Airport; intersection of Queen Ka'ahumanu Highway and Palani Road; and intersection of Queen Ka'ahumanu Highway and Waimea-Kawaihae Road.

Likewise, South Kohala Resort alone is not expected to significantly affect Keahole Airport's service, but the cumulative impact of resort development in West Hawaii will eventually require improvements to the airport. Existing and planned harbor facilities at Kawaihae will be adequate to accommodate the long-range water transportation needs of the region.

## **5.7 AIR QUALITY AND NOISE**

The overall effect of fugitive dust and engine exhausts during construction is expected to be temporary and minimal. Once completed, South Kohala Resort will have little direct impact on the air quality of the surrounding region. Carbon monoxide levels will increase significantly, as a result of heavier traffic, but projected worst-case levels are well within allowable state and federal air quality standards.

Noise levels along Queen Ka'ahumanu Highway will increase, with the impact being felt primarily in the proposed High Bluffs project, just makai of the highway, and residential lots on the mauka side of the highway. Approximately 30 percent of the total increases in traffic noise level from 1987 to 1998 is expected to be attributable to South Kohala Resort traffic, while 70 percent will be associated with non-project traffic.

Other noise impacts -- such as noise from construction activity and hotel maintenance equipment -- are expected to be temporary or minimal. Helicopter noise impacts will not be associated with the development, as helicopter facilities are not planned.

## **5.8 PUBLIC SERVICES AND FACILITIES**

Development of the resort will increase the demand for public services and facilities, mostly by new residents. It is anticipated that much of this demand can be met by planned facilities. For example, the new Kohala Coast Fire Station will provide improved fire protection, police, and emergency medical services to the region. Construction of new classrooms at Waimea Elementary/Intermediate and Honoka'a High School, as well as expansion of Konawaena Intermediate and High School, are planned to keep up with the

projected growth. A new public sanitary landfill in North Kona will be operational by the time the South Kohala Resort opens. Regardless of new development, health care facilities in West Hawaii will require upgrading, and to encourage this, Westin Hotels & Resorts recently contributed \$5 million to the Lucy Henriques Medical Center in Waimea.

There is an adequate water supply from the existing Lalamilo system to serve the hotel and associated amenities, as well as the initial 15 single-family units. As additional residential units are constructed, a new water source will have to be developed. South Kohala Resort will have its own private sewer system and wastewater treatment plant. Sufficient electrical power and communications facilities exist to serve the resort.

## **5.9 RECREATIONAL RESOURCES AND FACILITIES**

One of the major concerns about the proposed development is its potential impact on the adjacent Hapuna Beach State Recreation Area. Resort guests and residents and public park goers will share use of the popular white sand beach, and it is believed that some local residents may be discouraged from using the part of the beach fronting the resort because of the impression of exclusiveness and privacy. Another issue is future congestion at Hapuna as a result of new development in the region. It should be noted that currently, even during times of heavy usage when all Hapuna Beach Park parking stalls are occupied, the north third of the sand beach area is not as crowded as the southern two-thirds, which is closer to public parking. Development of the resort will not interfere with existing public access to and along the shoreline.

## **5.10 VISUAL CHARACTER**

The visual character of the site will be transformed from an arid, sparsely vegetated setting (primarily kiawe and grasses) to a developed, landscaped area with low-profile structures and a golf course. Views of the site from the shoreline and highway will change, as well as from the neighboring Hapuna Beach State Recreation Area and Mauna Kea Resort.

## **6.0 SUMMARY OF PROPOSED MITIGATION MEASURES**

Mitigation measures to reduce potential significant environmental effects to insignificant levels will be taken both in the short-term during construction and in the long-term during operations. The most important of these measures are summarized below. Some of the impacts are cumulative, due not only to South Kohala Resort but other planned developments in the region, so many of the proposed mitigation measures will have to be carried out by government, often in cooperation with the private sector.

- o The South Kohala Resort drainage system will be designed to avoid affecting the basic drainage patterns of the area.
- o Although very unlikely, any chance of contamination of Hapuna Bay by fertilizers and pesticides will be avoided by adherence to management practices followed by Mauna Kea Resort in the maintenance of the golf course and landscaping.

- o The applicant intends to follow the recommendations made to minimize potential impacts of development on significant archaeological features. The general significance assessments and recommended general treatments for all archaeological sites identified in the study area have been reviewed by the appropriate State and County agencies.
- o Mauna Kea Properties is working with government agencies on a plan to assure that adequate housing is available for South Kohala Resort employees. One alternative is the expansion of employee housing at Kawaihae Village. Alternatively, Mauna Kea Properties would agree to participate in the expansion of the Kealakehe housing project. Government provision of infrastructure and residentially zoned lands will help assure that private-sector housing initiatives keep pace with resort development.
- o Steps will be taken to maximize employment of current residents by South Kohala Resort and thereby reduce in-migration. Many of these measures will require cooperative efforts by the public and private sectors: job preparation and training, job awareness outreach programs, changes in management to accommodate "local" cultures, child care programs, and employee transportation assistance.
- o Methods will be explored to manage the impacts of resort development and population growth, including creation of an ongoing forum to promote regular communication between resorts and residents (perhaps modeled after the South Kohala Resort Advisory Committee).
- o Since traffic impact is the result of an accumulation of traffic from all generators, the mitigation measures would most effectively be approached on a coordinated regional basis by public and private entities. Suggested measures include the addition of roadway lanes and construction of intersection improvements and implementation of programs for carpooling, staggered work hours, and busing of employees.
- o A water source on the applicant's lands will be developed to supplement the existing Lalamilo supply and accommodate the total planned resort. Steps will be taken to confirm water and property rights and to coordinate the project with the State and County.
- o The possible impact of intrusion on Hapuna Beach by hotel guests, thus discouraging use by the public, will be minimized or avoided by specific measures taken by the hotel to avoid any impression that the north end of the beach is private or exclusive.
- o Future congestion at Hapuna is a cumulative impact that will require government action. It is proposed that the State upgrade and expand Hapuna Beach State Recreation Area to include Wailea Bay, as originally conceived in the 1970 park development plan. Mauna Kea Properties is willing to work with the State on this project; it has already offered the alternative of providing parking spaces and access at Wailea. Congestion can also be alleviated by developing other State-owned lands adjacent to sandy beaches as public parks.

- o The visual impact of the development will be minimized through the use of landscaping, the maintenance of open space and buffer zones, and the design of low-profile, low-density structures.

## 7.0 SUMMARY OF ALTERNATIVES

Several alternatives to the proposed action were considered but rejected as not meeting the stated objective: to develop an economically viable luxury resort community on the site.

- o Resort developed without shoreline improvements.
- o Shoreline setback variance not granted and hotel parcel condemned by the State.
- o Project abandoned and land left vacant.
- o Project abandoned and land sold to State or County.
- o Project abandoned and land sold to another private entity.
- o Higher density resort developed (with or without shoreline setback variance).
- o Different resort layout: hotel sited either further away from shoreline, on the rocky shoreline between Hapuna and Kauna'oa Bays, or at the south end of Kauna'oa Bay.

## 8.0 SUMMARY OF UNRESOLVED ISSUES

- o Timing and extent of actual regional growth.
- o Availability of adequate employee housing.
- o Total housing impacts resulting from all resorts in the region, including on-site and off-site jobs, as well as induced and non-induced immigration.
- o Transportation improvements required.
- o Traffic generated by secondary and tertiary population growth.
- o Accuracy of water demand standards used and actual water requirements of the resort.
- o New water source: location, development costs, and legal requirements.
- o Degree to which development of the project would contribute to higher levels of beach use and a less satisfactory experience to current users of Hapuna Beach.

- o Government strategies needed to mitigate future congestion at Hapuna Beach State Recreation Area.

**9.0 SUMMARY OF COMPATIBILITY OF LAND USE POLICIES AND PLANS**

The project is basically consistent with State and County land use plans and policies.

**10.0 NECESSARY APPROVALS AND PERMITS**

The major approvals required for the project are listed below, along with the status of each. In addition, a number of other permits need to be obtained from the County of Hawaii in order for work to proceed. These include: grubbing, grading, excavation, and stockpiling permit; building permit; outdoor lighting permit; sign permit; and water system approval. Drinking water system approval is required from the State Department of Health.

| <u>Approval Needed</u>          | <u>Approving Agency/Body</u> | <u>Status</u>                                                                                                                                |
|---------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| SMA Permit                      | County Planning Commission   | Pending                                                                                                                                      |
| Shoreline Setback Variance      | County Planning Commission   | Pending                                                                                                                                      |
| PUD Permit                      | County Planning Department   | Approved but may need to be amended.                                                                                                         |
| Subdivision Approval            | County Planning Department   | Tentative approval granted.                                                                                                                  |
| County Zoning                   | County Council               | Portions of resort lands will require rezoning.                                                                                              |
| State Land Use Reclassification | State Land Use Commission    | Incremental redistricting approved; SLUC to determine compliance with substantial completion of Increment I before Increment II can proceed. |

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## *CHAPTER II*

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## CHAPTER II

### DESCRIPTION OF THE PROPOSED ACTION

#### 1.0 REGIONAL SETTING

The site of the proposed South Kohala Resort is located on the northwest coast of the Big Island of Hawaii in the South Kohala District (Figure II-1). It is within what has become known as the Kohala Coast Resort Region, an area devoted to high quality resort-residential developments such as the Mauna Kea Resort, Mauna Lani Resort, and the Waikoloa Beach Resort.

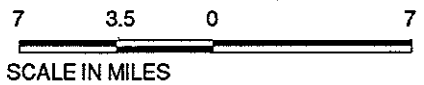
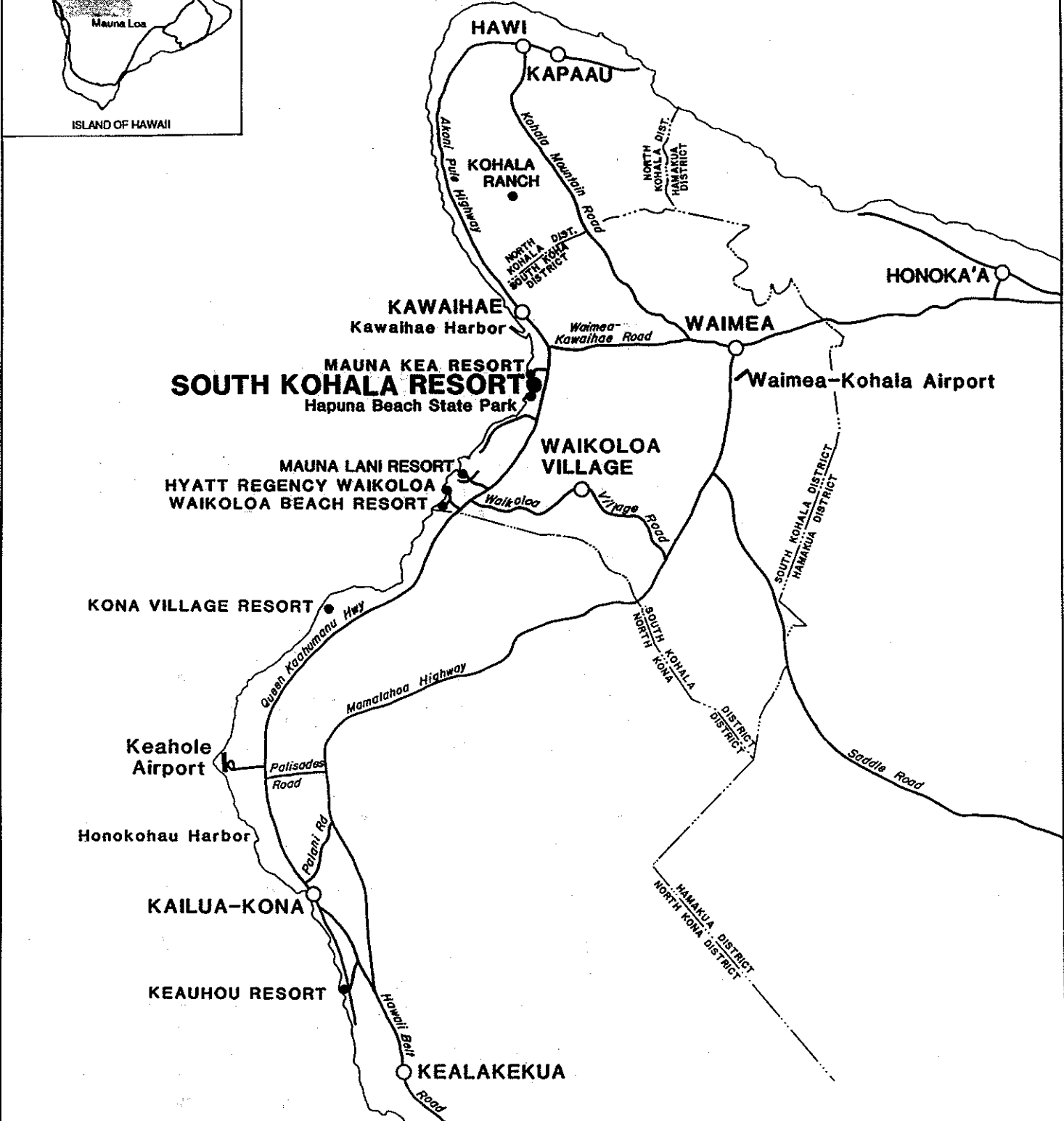
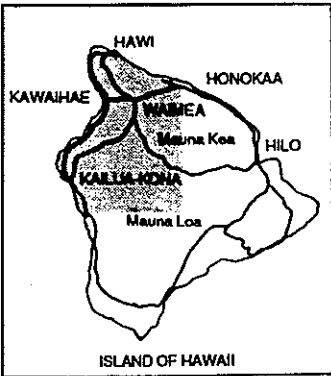
The 489-acre site fronts the shoreline at the northern end of Hapuna Bay, with the Mauna Kea Resort to the north and Hapuna Beach State Recreation Area to the south. Lands on both sides of the Queen Ka'ahumanu Highway are included in the site, which extends mauka to the corridor of the planned Waimea-Kawaihae Road and lands owned by the State of Hawaii and the Queen Emma Foundation. The tax map key numbers are as follows: TMK 6-2-01:por. 51; TMK 6-2-02:12; and TMK 6-6-02:37.

Access to the site, as well as to the region as a whole, is mainly by the Queen Ka'ahumanu Highway linking Kailua-Kona with Kawaihae Harbor. The highway provides access to the region from Keahole Airport, the major airport in West Hawaii, approximately 24 miles from the project site. Kawaihae Harbor, West Hawaii's major deep-water port facility, is located a few miles north of the site.

Waimea, the Kohala district population and commercial center, is approximately 12 miles to the northeast of the proposed project site. It is the headquarters of the Parker Ranch and home to small businesses catering to local farming and ranching activities and to the local population. Other residential communities within commuting distance of the proposed South Kohala Resort include Kawaihae Village, Waikoloa Village, Puako, Hawi, and Kapa'au.

Recreational and cultural resources within the vicinity of the proposed South Kohala Resort include Hapuna Beach State Park, Samuel Spencer Park, Pu'ukohola Heiau National Historic Site, and further north, Lapakahi State Historic Park. A small boat marina is part of the Kawaihae Harbor complex.

The South Kohala coastline has long been recognized as a desirable location for the development of large-scale resort activities. It has been designated by the State of Hawaii and the County of Hawaii in their various plans as a major resort region. Substantial investments have been made in the public infrastructure needed to stimulate and support this development. These include construction of the Queen Ka'ahumanu Highway, Keahole Airport, and the Lalamilo Water System, as well as improvements to Kawaihae Harbor. In conjunction with these government sponsored efforts, private landowners have prepared and begun implementation of plans for large resort complexes along the coastline.



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 Honolulu, Hawaii September 1987

**Figure II-1**  
**KOHALA & NORTH KONA REGION**

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii



Mauna Kea Resort was the first of the three major resort projects to establish its presence in South Kohala. The world famous Westin Mauna Kea (formerly the Mauna Kea Beach Hotel) and golf course were constructed in the mid-1960s, and 65 single-family houselots (The Fairways at Mauna Kea North and South) and 40 condominium units (The Villas) have subsequently been developed. Also developed was the 67-unit Kawaihae Village, including single-family, townhouse, and apartment units intended primarily for hotel employees.

About six miles south of the proposed South Kohala Resort is the Mauna Lani Resort, situated at Kalahuipua'a between Pauoa and Honoka'ope Bays. Completed to date are the 351-room Mauna Lani Bay Hotel, as well as two condominium projects. Like the Westin Mauna Kea, the Mauna Lani Bay Hotel is of world class luxury quality. Future plans at Mauna Lani Resort include construction of the 450-room Ritz-Carlton Mauna Lani hotel, a second 18 holes of golf, a public shoreline park, and the next increment of residential units or lots.

The third major resort in the region, situated just south of Mauna Lani, is the Waikoloa Beach Resort at Anaeho'omaluu. It includes the 543-room Sheraton Royal Waikoloa hotel, a 120-unit resort condominium project, a golf course and other common recreational facilities, as well as numerous individual houselots. Under construction is the 1,250-room Hyatt Regency Waikoloa Hotel at Waiulua Bay, scheduled to open by the end of 1988.

Although the South Kohala Resort project site is located in an area that remains predominantly rural, the proposed resort and residential uses are consistent with the increasing urban uses of lands in the vicinity and in keeping with State and County plans for the region.

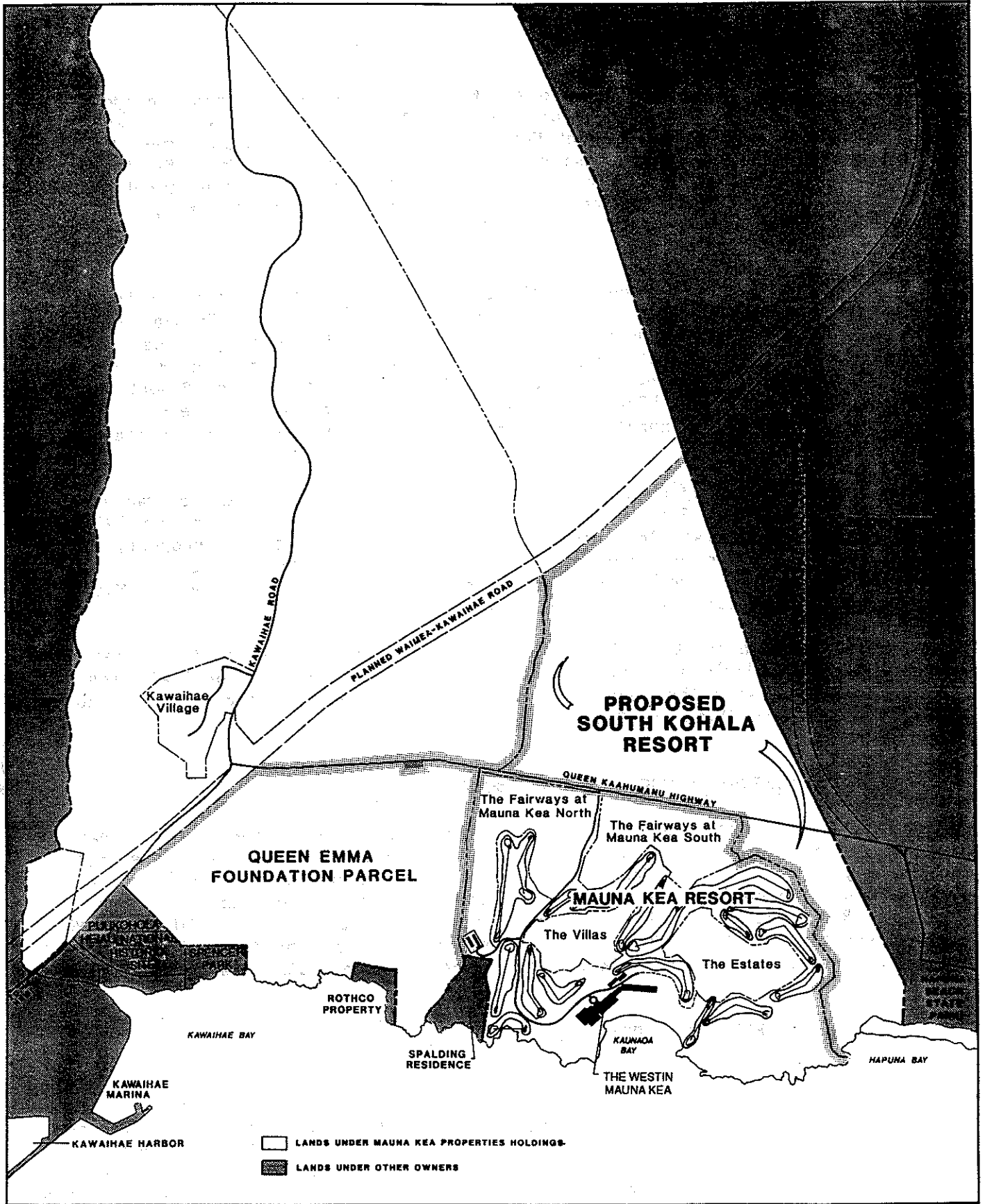
## **2.0 HISTORY OF SOUTH KOHALA RESORT**

South Kohala Resort is one of three Mauna Kea Properties holdings in South Kohala, as shown in Figure II-2. South Kohala Resort lands were originally owned by Parker Ranch and leased to the Olohana Corporation in the early 1960's, except for the 32-acre hotel parcel, which was sold in fee to Laurance S. Rockefeller. In 1979, Olohana's interests were acquired by UAL, Inc. More recently, in 1986, Mauna Kea Properties, Inc. (a subsidiary of UAL, Inc.) purchased the remaining leasehold interest in the South Kohala Resort lands.

## **3.0 DEVELOPMENT CONCEPT**

### **3.1 STATEMENT OF OBJECTIVES**

The objective is to develop an economically viable luxury resort community on its oceanfront property adjacent to Hapuna Bay. The self-contained, full-amenity resort will be anchored by a luxury class hotel, tennis complex, and 18-hole championship golf course and will be completely independent of the Mauna Kea Resort.



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NORTH

Figure II-2  
 MAUNA KEA PROPERTIES LANDS

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

### 3.2 DESCRIPTION OF PROPOSED PROJECT

South Kohala Resort will be characterized by a mix of complementary low-density land uses; the existing surrounding uses and the proposed land use concept plan for South Kohala Resort are shown in Figures II-3 and II-4. Improvements within the 40-foot shoreline setback area are planned.

A luxury hotel, tennis complex, and 18-hole championship golf course and clubhouse will be the focus of the resort (Figure II-5). Also planned are multifamily and single-family residential units, unimproved lots, and house and lot packages, which are expected to accommodate permanent residents, second home owners, and transient guests. In addition, a beach club adjacent to the proposed hotel and a recreation community center in the mauka lands are planned to serve the resort residents. A sewage treatment plant, maintenance facility, and offices will be housed in a resort services area, located in the mauka lands. Proposed shoreline improvements include: landscaping, irrigation, improvements to the public beach access nature trail, and installation of ancillary features.

In accordance with the approved SMA permit, public parking and a public right-of-way to the shoreline will be shown on the site plan in the Final EIS as located adjacent to the resort's boundary with Hapuna Beach State Recreation Area. There are alternatives to this solution, including the provision of additional parking by the applicant at the north end of the State park.

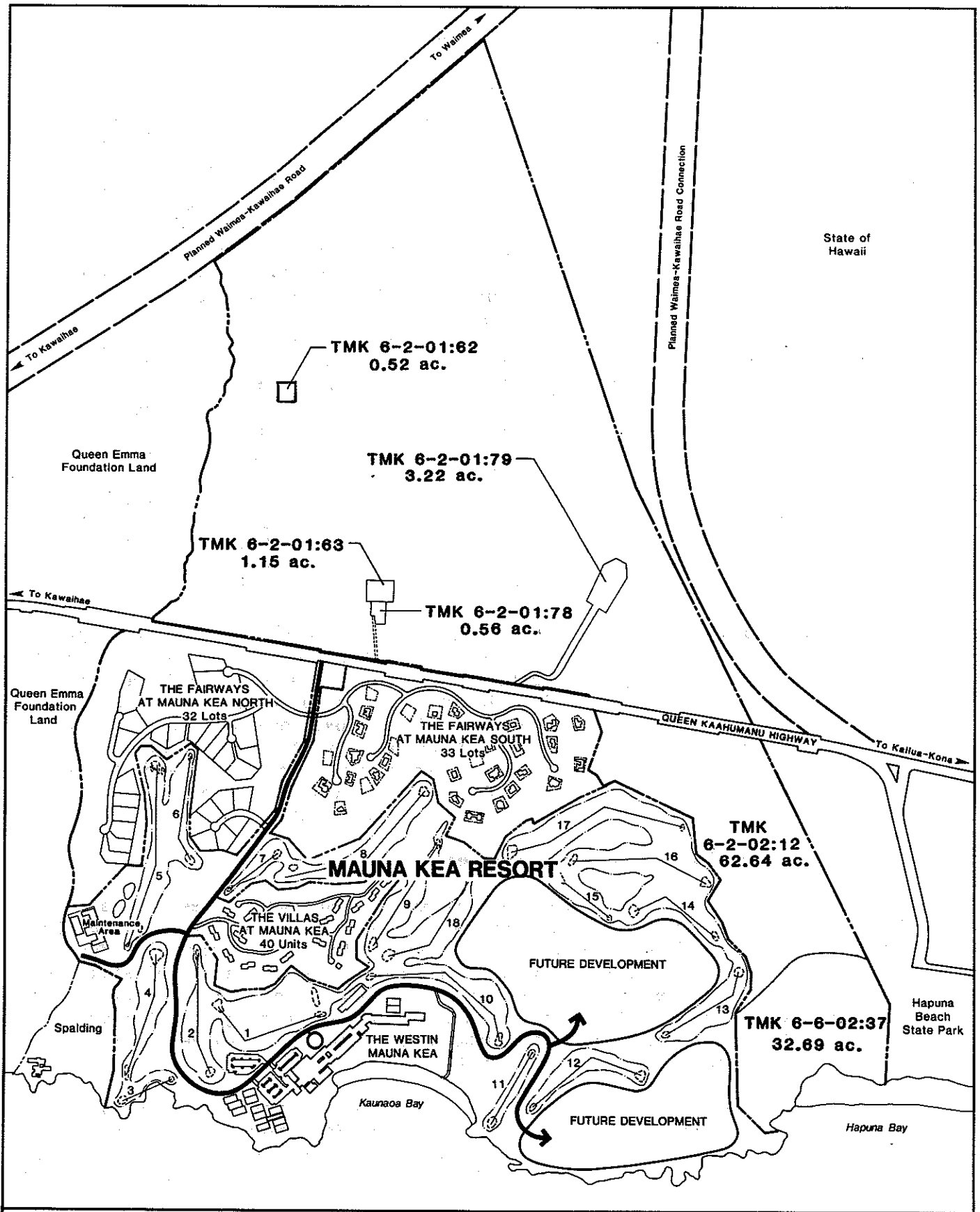
In previous governmental permit applications, a 38-acre shoreline parcel north of the hotel site was part of the proposed South Kohala Resort development. This parcel was to have been the site of "The Bluffs," a multifamily residential project with 150 to 250 units. The Bluffs are no longer part of the South Kohala Resort and thus are not included as part of the environmental impact analysis. The reader should note that the Bluffs project has been included in studies described in this document, which were prepared prior to the decision to remove the Bluffs parcel from the proposed South Kohala Resort development. With the removal of the Bluffs parcel, impacts are generally less.

#### 3.2.1 Resort Hotel and Tennis Complex

The proposed hotel will have approximately 350 rooms in several attached hotel structures -- each varying from one to six stories and reaching a maximum height of 75 feet. The buildings will fit within the PUD (planned unit development) building envelope for the site. Contemporary in architectural style, the low-profile structures will follow the sloped contour of the property. Thus, buildings will appear to be only two to four stories in height to the arriving visitor. Extensive landscaping throughout the site will provide a garden-like setting. (See Figures II-5, II-6, and II-7.)

Proposed plans for the hotel call for 10,000 square feet of meeting and banquet space, 330 mini-suite rooms of 600 square feet each (with an additional 90 to 100 square feet of lanai), 18 suite rooms of at least 850 square feet, 2 presidential suites of 1,600 square feet, 12,000 square feet of health club space, and an 80 to 100-seat restaurant.

Located on a 32-acre site, the hotel will have a full complement of outdoor amenities normally associated with a luxury-class hotel, including a tennis complex (about 11 courts -- see Figures II-8 and II-9), swimming pool, luau



**Figure II-3  
EXISTING LAND USE AND TAX MAP KEYS**

**SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii**

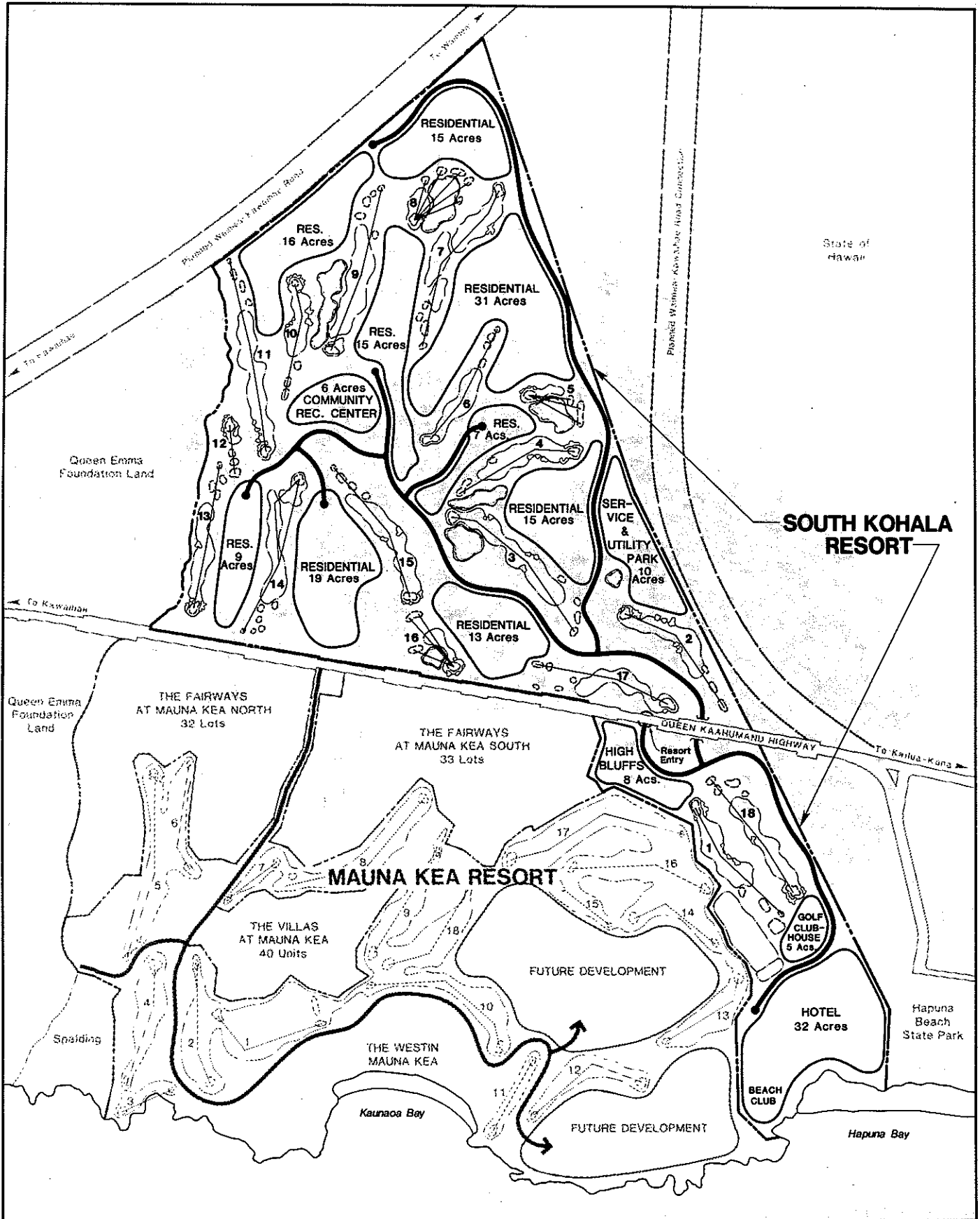
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Honolulu, Hawaii September 1987



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Honolulu, Hawaii

September 1987



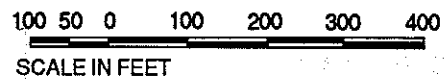
NORTH

**Figure II-4  
LAND USE CONCEPT PLAN**

**SOUTH KOHALA RESORT**  
Kohala Coast Resort Region • South Kohala, Hawaii



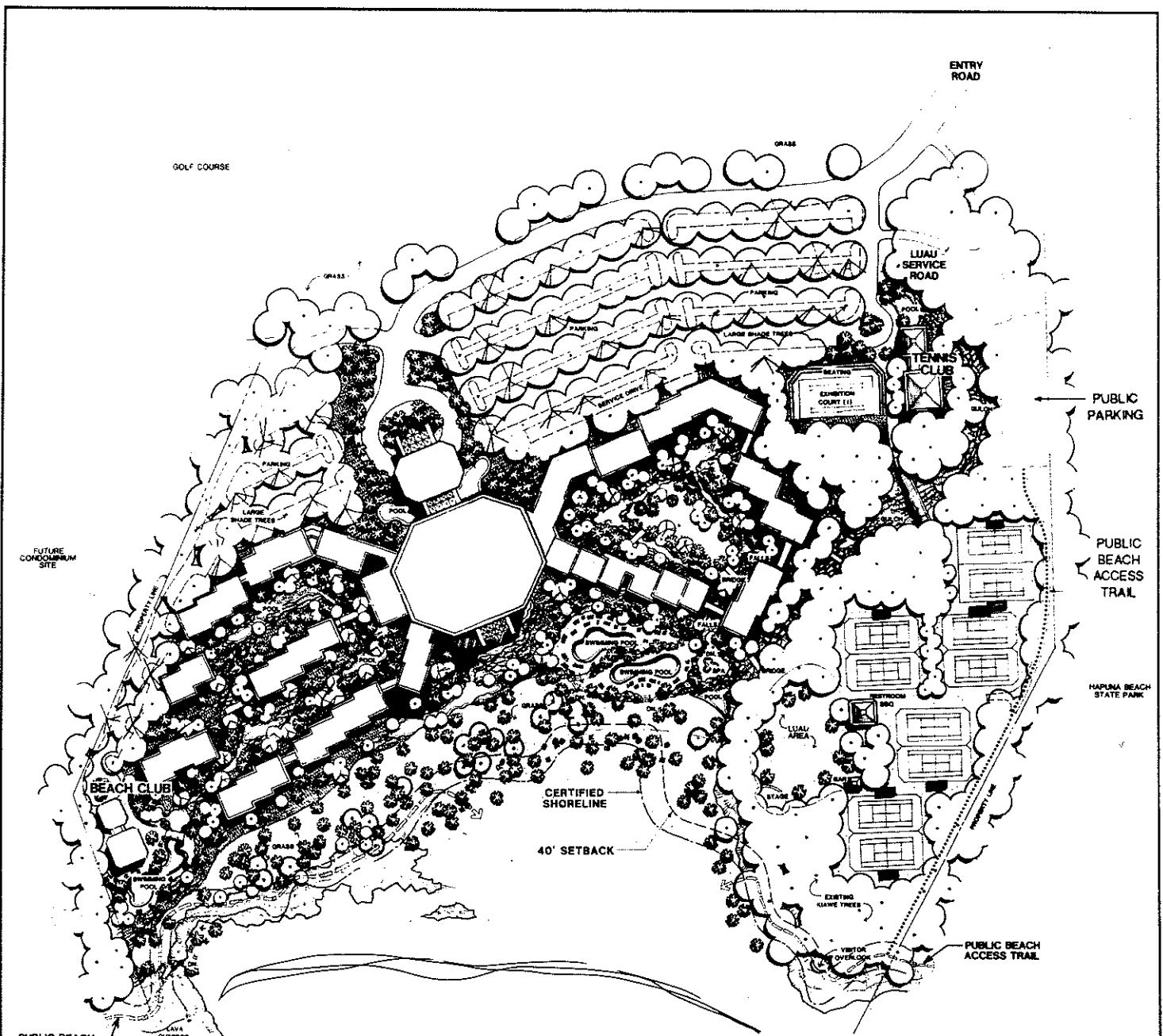
Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS



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Honolulu, Hawaii September 1987



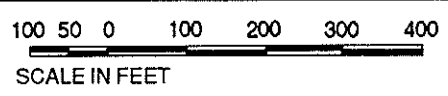
**Figure II-5**  
**HOTEL PARCEL CONCEPT PLAN**  
SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii



**LEGEND:**

| Symbol | Description                                    |
|--------|------------------------------------------------|
|        | Large shade trees (Monkeypod, Banyan)          |
|        | Existing Kiawe Trees                           |
|        | Medium flowering trees (Shower, etc.)          |
|        | Small trees (Plumeria, Beach Heliotrope, etc.) |
|        | Palms (Coconut, Loulu, etc.)                   |
|        | Shrub/groundcover                              |
|        | Grass                                          |

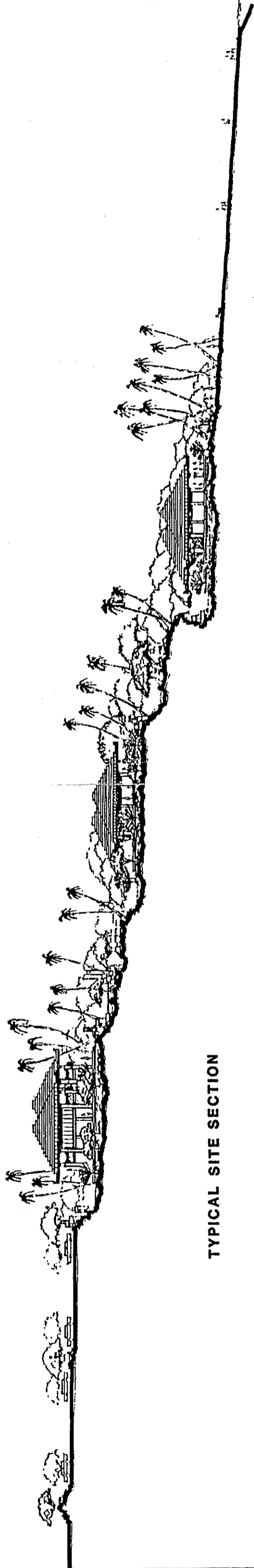
Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS



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Honolulu, Hawaii September 1987

**Figure II-6  
HOTEL LANDSCAPE CONCEPT PLAN**

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii



TYPICAL SITE SECTION

Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS

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Honolulu, Hawaii

September 1987

Figure II-7

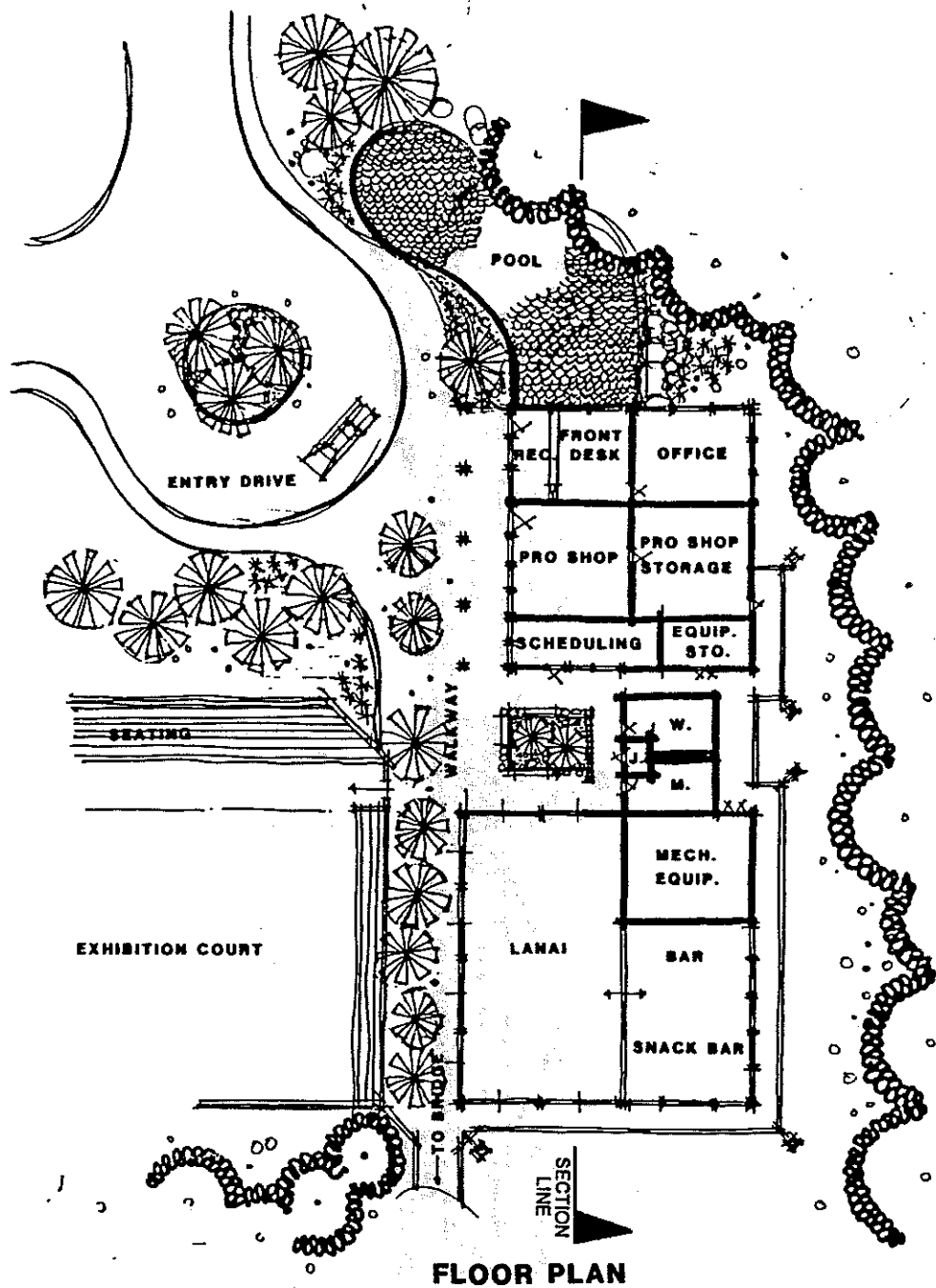
TYPICAL HOTEL SITE SECTION

NORTH WING

SOUTH KOHALA RESORT

Kohala Coast Resort Region • South Kohala, Hawaii





Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS

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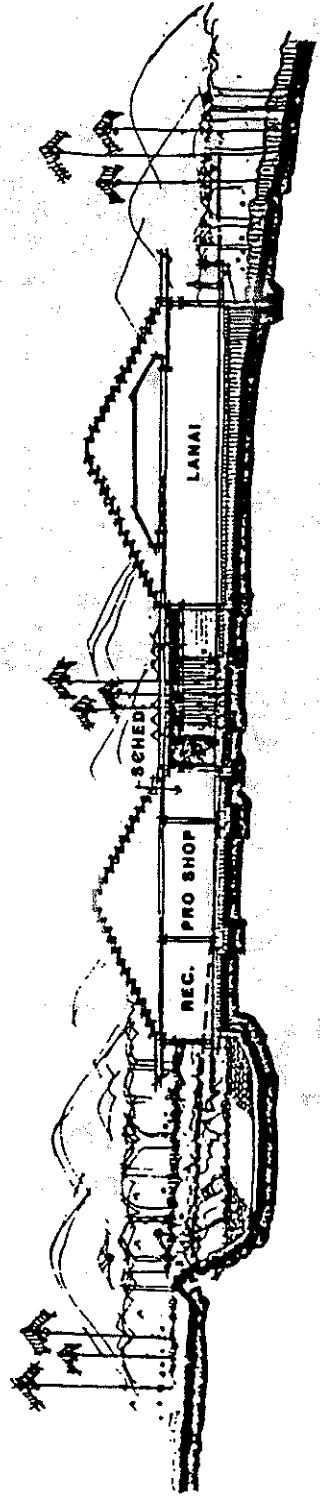
Prepared By: BELT COLLINS & ASSOCIATES  
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NORTH

Figure II-8  
TENNIS CLUBHOUSE FLOOR PLAN

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii



**SECTION**

Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS

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Honolulu, Hawaii

September 1987

**Figure II-9**  
**TENNIS CLUBHOUSE SECTION**

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

garden, general outdoor activity area, pedestrian walkways, and extensive landscaping incorporating introduced and indigenous plants. The tennis facility is expected to be open to residents of the resort as well as to hotel guests. Parking will be provided near the entrance of the hotel in the mauka portion of the project site. Landscaping will be installed in and around the parking area for screening and shade.

### **3.2.2 Proposed Shoreline Improvements**

The shoreline fronting the proposed project will essentially be maintained in open space with some improvements to enhance the physical setting and to improve public usage and safety. The applicant proposes to extend landscaping from the development site into the 40-foot shoreline setback to carry forth a continuous garden setting to the beach and rock areas of the shoreline. Uncontrolled vegetative growth will be replaced with landscaping, including grass and introduced plants. Native species will be retained or planted whenever possible. Specimen trees will be kept and some trimmed kiawe retained. An irrigation system will be installed and connected to the overall resort system.

Portions of the existing six-foot wide public beach access nature trail fronting the hotel will be improved. The walkway will be paved and steps added where they are needed and warranted for safety reasons. To enhance night-time safety, unobtrusive, low-level, non-glare lighting will be installed, as required. Overhead trellises are also planned for certain portions of the walkways.

Ancillary features are proposed to facilitate maintenance of the shoreline area and enhance its use. These include pedestrian lookout and seating areas, lawn furniture, planters, rubbish receptacles, and informational/directional signs.

### **3.2.3 Golf Course and Clubhouse**

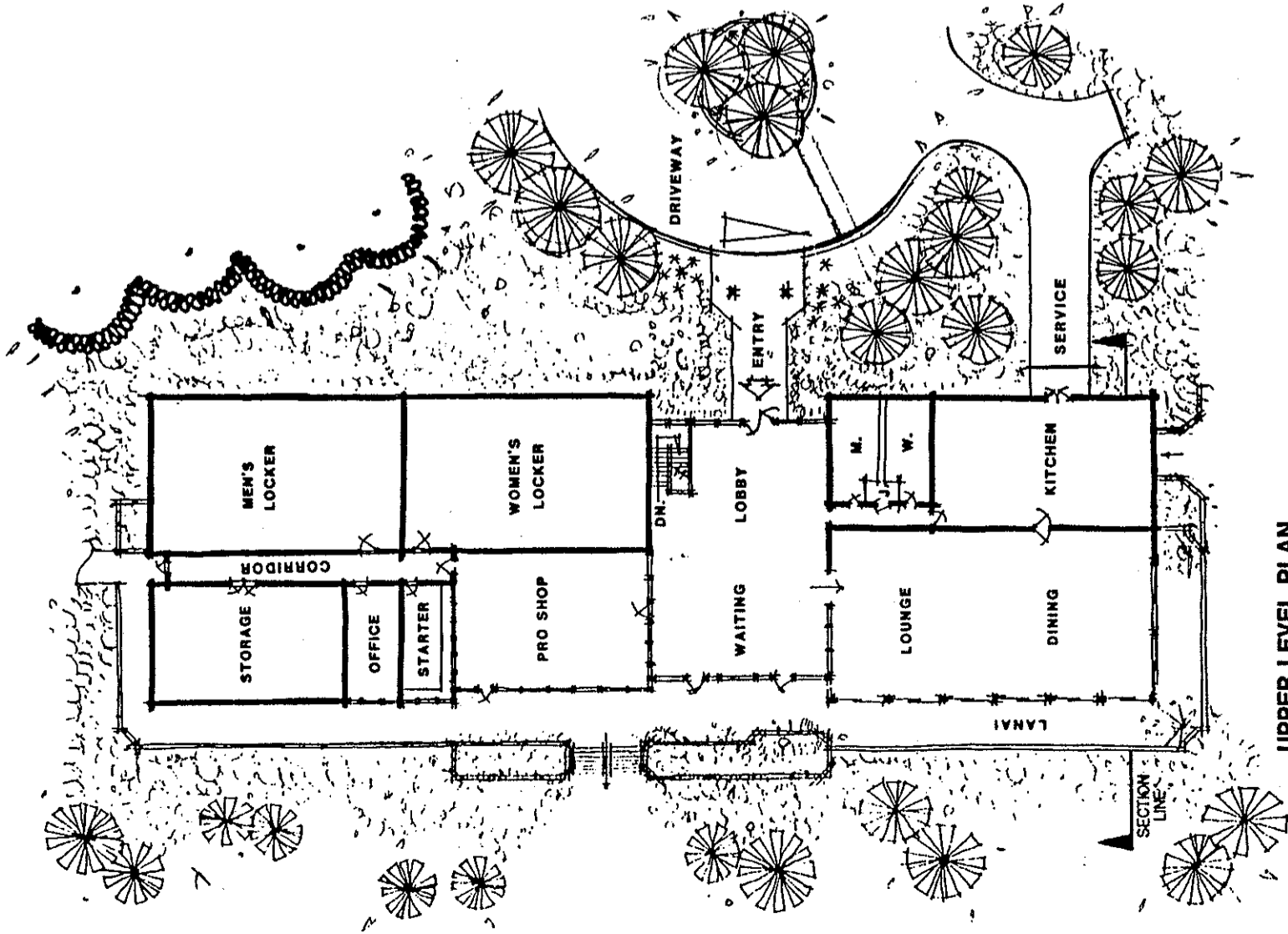
The golf course will include 18 holes of championship golf (2 holes and a practice driving range makai of the Queen Ka'ahumanu Highway and 16 holes above the highway), a clubhouse, and a refreshment shelter in the mauka lands. An underpass beneath the highway will be required to allow golf carts and vehicles to cross between the mauka and makai lands.

Located on a 3.9-acre site near the planned hotel, the one-story clubhouse will have approximately 30,000 square feet of floor area (Figure II-10). Proximity to the hotel is important since hotel guests will be the primary patrons. Present plans call for a pro shop, office, video room, dining/meeting room, cocktail lounge, locker rooms/toilets, and golf equipment and cart storage facilities. Parking will be provided.

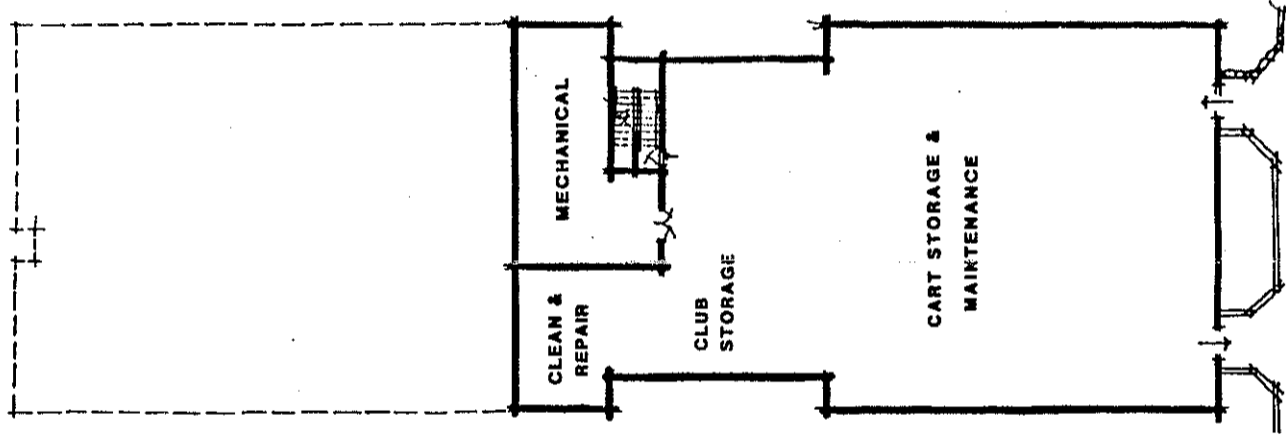
The golf course will be semi-private; residents of South Kohala Resort will have the right to membership, and the course will be open to the public.

### **3.2.4 Residential Units**

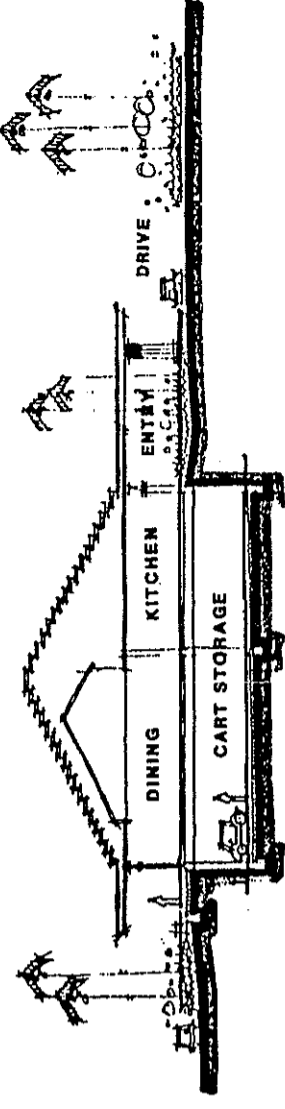
Approximately 560 residential units and/or lots are planned for the resort. A mixture of types of units is proposed to add variety and broaden appeal.



UPPER LEVEL PLAN



LOWER LEVEL PLAN



SECTION

Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS

SCALE IN FEET  
 16 8 0 16 32 48 64

Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii

September 1987



NORTH

Figure II-10  
 GOLF CLUBHOUSE PLANS AND  
 SECTION  
 SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

In the makai lands, adjacent to the resort entry, is a planned site for single-family house lots similar to those in the neighboring Fairways at Mauna Kea South. It is anticipated that ten lots with a minimum 20,000-square-foot area will be developed, to be known as The High Bluffs.

The remaining 550 residential units will be mauka of the highway. There will be a mixture of multifamily and single-family homes, with a combination of lot and house and lot packages. A total of 125 acres will be required for residential use in this area. Prices for the multifamily homes are estimated to range from \$500,000 to \$600,000, and from \$175,000 to \$225,000 for the single-family lots (1987 dollars).

Average densities are expected to be low--five units per acre for multifamily sites and two units per acre for single-family sites. Surrounded by abundant landscaped open areas (landscaping will be a major feature at each site), the multifamily structures will be either one, two, or three stories high. An important design objective is to give each unit a panoramic view of the Kohala coast. It is anticipated that design standards will be adopted for each project and administered by design committees to ensure design control and continued property maintenance.

### 3.2.5 Beach Club

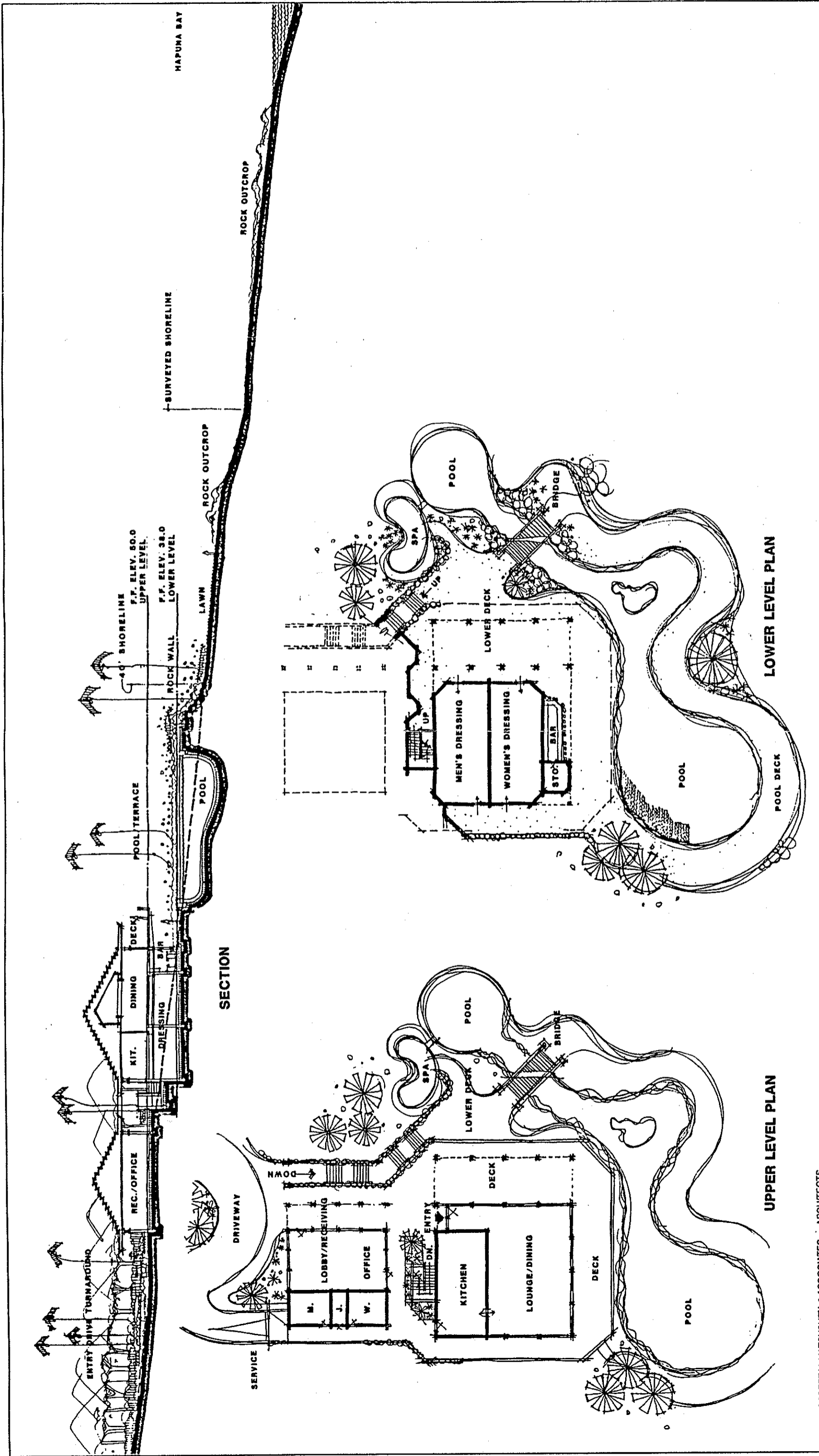
Adjacent to the proposed hotel, the applicant plans to develop a beach club that will be open to guests and residents of South Kohala Resort (Figure II-11). Occupying approximately three acres of land, it will be accessible from the resort entry road and Queen Ka'ahumanu Highway. The entire pool deck and clubhouse will cover about 24,000 sq. ft. of floor area. Facilities will include a lobby reception area, dining room and lounge, kitchen, decks, and dressing rooms. Required parking spaces will be located within the adjacent hotel parking area.

### 3.2.6 Community Recreation Center

A recreation center to serve the South Kohala Resort residential community is proposed for a six-acre site centrally located to the mauka units (near the golf course refreshment shelter). Present plans call for about 30,000 sq. ft. of floor area, including a dining room and bar, restrooms, multi-purpose recreation room, and locker room. A small convenience store may be included in the facility. Outside will be a swimming pool, tennis courts, barbeque area, and parking.

### 3.2.7 Infrastructure

**Resort Drive.** South Kohala Resort will be served by an entry drive from Queen Ka'ahumanu Highway. Designed to resort standards, this access will include a 22-foot wide road pavement, graded shoulders, and swales within a 60-foot wide right-of-way. The entry station at the head of the drive will be landscaped. Maintained in private ownership, the drive will extend into the resort in a winding fashion (see Figure II-12). The resort drive will require an underpass beneath Queen Ka'ahumanu Highway to permit vehicular and pedestrian movement between the coastal and upland areas. (An at-grade crossing or an overpass probably would not be appropriate for the resort.) This underpass will include separate golf cart pathways, which could also serve as pedestrian walkways, bordering the outside edges of the vehicular lanes. An opening of approximately 38 to 42 feet will be required for the proposed underpass, which will eliminate



Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS

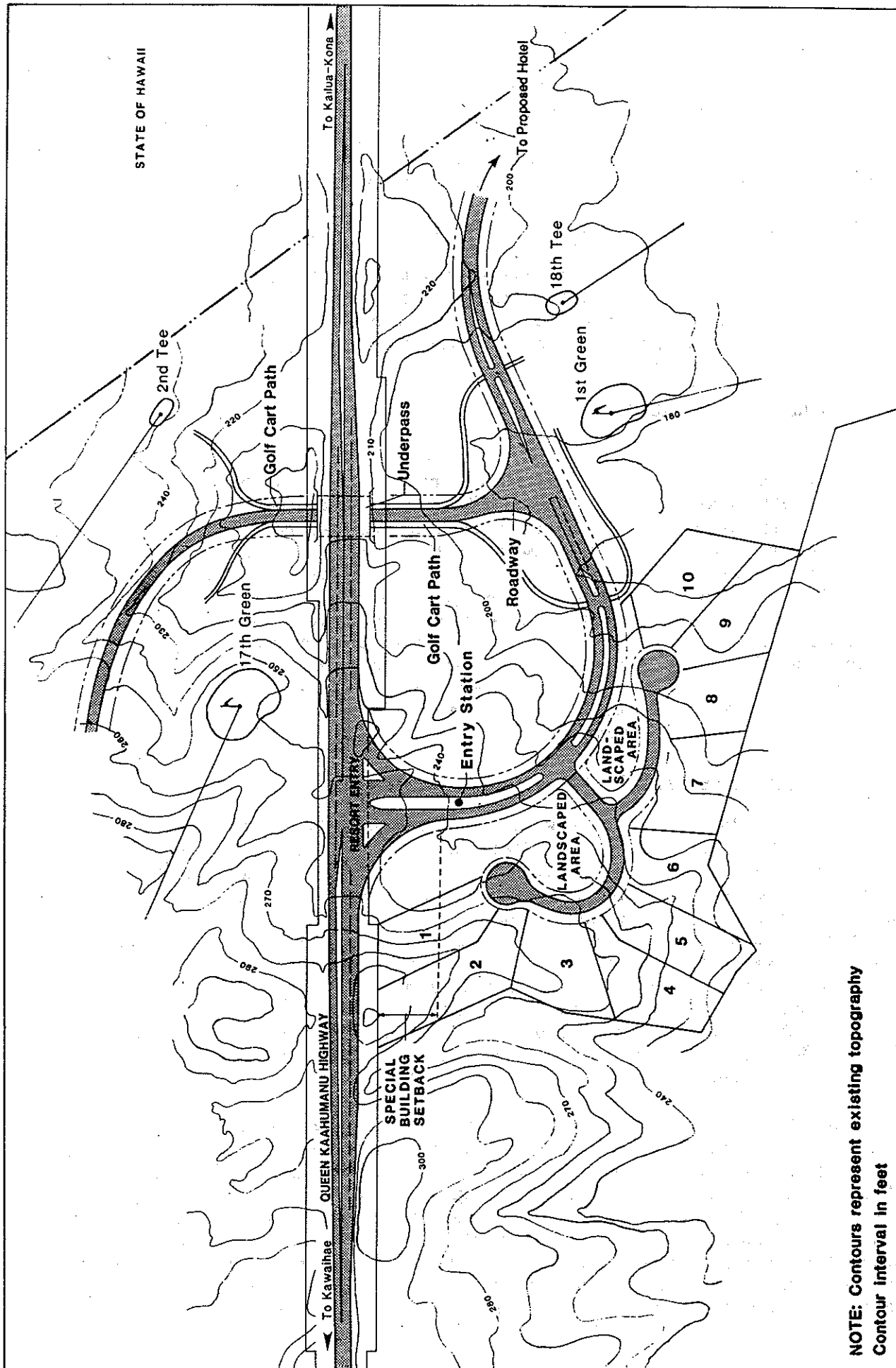
SCALE IN FEET  
 16 8 0 16 32 48 64



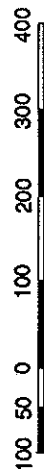
Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii September 1987

Figure II-11  
 BEACH CLUB PLANS AND SECTION

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii



**NOTE: Contours represent existing topography**  
**Contour interval in feet**



SCALE IN FEET



NORTH

Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii      September 1987

**Figure II-12**  
**THE HIGH BLUFFS AND**  
**RESORT ENTRY**

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

the need for any cross traffic on the Queen Ka'ahumanu Highway. Design of the specific configuration will be submitted to the appropriate agencies for review and approval. All work within and under the public right-of-way will be part of the resort project, the impacts of which are assessed in this EIS.

**Utilities.** South Kohala Resort will include all necessary utilities: water, sewer, electrical power, telephone, and CATV. Utility lines will be installed underground and placed generally within road rights-of-way. Projected utility requirements and their impacts are discussed in Chapter V, Section 5. Included in the land use concept plan is a resort services complex in the mauka lands to accommodate the sewage treatment plant, a golf course maintenance facility, and resort offices.

### 3.3 NEED FOR THE PROJECT

Ming Chew Associates prepared an analysis of the demand for hotel and resort residential units and associated resort uses to be offered by the proposed South Kohala Resort (May 1987). The study, which is included in Appendix A, concludes that there will be a strong demand for such facilities through the year 2000. Primary markets that could be served by the entire resort project were identified, general economic trends assessed, and projections made of visitor arrivals for the State and County of Hawaii. Resulting projections were then converted into demand estimates for total transient accommodations, hotel rooms, resort multifamily residential units, resort subdivision houselots, and the proposed 18-hole championship golf course. The demand estimates, in turn, were compared with existing and planned supply to arrive at marketability conclusions for the proposed South Kohala Resort. Table II-1 summarizes these projections.

#### 3.3.1 Hawaii County Visitors

After two flat years for Hawaii's visitor industry in 1980 and 1981, the number of visitor arrivals to the State has rebounded and increased almost 15 percent in 1986. The number of visitors to the neighbor islands in general has increased faster than to the State as a whole. Although the County of Hawaii visitor industry as a share of statewide activity declined from 1971 to 1986, the estimated number of westbound visitors to the island, the primary source of the County's visitors, has reversed its decline from the low reached in 1981. Despite countywide trends, visitor industry activity on the Kohala coast has been spirited. In 1983, the number of transient accommodation units in North and South Kohala exceeded the number in Hilo for the first time. Also, from 1983 to 1986, the region's share of the island's occupied units has been about twice the estimated 11 percent recorded in 1980.

A number of factors are expected to expand basic demand in the region: efforts to divert tourism from Waikiki and Oahu to the neighbor islands, preference for neighbor island amenities by the increasing number of repeat visitors to the State, continued development of high-quality resort amenities and accommodations, direct flights from the U.S. mainland west coast to Keahole Airport by United Airlines, cooperative advertising for the Kohala Coast Resort Region between the existing resorts and United Airlines and Hawaiian Airlines, programs to promote neighbor island destinations by Japan Air Lines, and increased promotions and marketing efforts by the new facilities on the Kohala Coast.



TABLE II-1

PROJECTED MARKETABILITY  
 PROPOSED SOUTH KOHALA RESORT  
 Kohala Coast Resort Region  
County of Hawaii, State of Hawaii

|                            | <u>Recommended</u> | <u>Projected Marketability</u> |              |              |
|----------------------------|--------------------|--------------------------------|--------------|--------------|
|                            |                    | <u>1990</u>                    | <u>1995</u>  | <u>2000</u>  |
| HOTEL ROOMS                | 350                | 300                            | 500          | 600          |
| LOW-RISE MULTIFAMILY UNITS |                    |                                |              |              |
| Mauka                      | 450                | 300                            | 800          | 1,400        |
| HOUSELOTS                  |                    |                                |              |              |
| Makai                      |                    |                                |              |              |
| Lot                        | --                 | 5                              | 5            | 5            |
| House and Lot              | --                 | 5                              | 5            | 5            |
| Subtotal                   | <u>10</u>          | <u>10</u>                      | <u>10</u>    | <u>10</u>    |
| Mauka                      |                    |                                |              |              |
| Lot                        | --                 | 25                             | 75           | 135          |
| House and Lot              | --                 | 25                             | 75           | 135          |
| Subtotal                   | <u>100</u>         | <u>50</u>                      | <u>150</u>   | <u>270</u>   |
| Total                      | 110                | 60                             | 160          | 280          |
| TOTAL (ROOMS/UNITS/LOTS)   | <u>900</u>         | <u>660</u>                     | <u>1,460</u> | <u>2,280</u> |
| GOLF ROUNDS, ANNUAL        | 45,000             | 38,000                         | 72,000       | 128,000      |

SOURCE: Ming Chew Associates

The Ming Chew Associates resort unit demand estimates are based on historical levels of tourism to the State, Hawaii Visitors Bureau (HVB) estimates, and the firm's own assumptions regarding Hawaii County's capture rate. Visitor estimates and forecasts are summarized in Table II-2. These projections indicate that by the year 2000, there will be approximately 2,120,000 visitors a year to the Island of Hawaii. The proportion of both westbound and eastbound visitors to the Big Island, as a percentage of total state estimates, is expected to increase from 18.5 percent in 1986 to 30 percent in 2000 for the former, and from 11 percent to 20 percent for the latter.

### **3.3.2 Visitor Characteristics**

From 1970 to 1986, many characteristics of westbound visitors destined to Hawaii have changed, even after excluding the effects of the the military Rest and Recuperation (R&R) program. For example, after increasing to 47 percent during the mid-1970s, the percentage of persons traveling on organized tours decreased to 15 percent in 1986, the lowest level since the mid-1960s. Party size has increased continually, and in 1986 reached 1.86. Median age has declined to about 40 years old. A smaller share stayed less than seven days, and a larger share stayed seven to twelve days, but the average stay has changed very little. In addition, pleasure travel appears to be increasing.

The percentage of first time visitors dropped from 67.2 percent in 1970 to 49.6 percent in 1983, making it the first year in which first-time visitors represented less than half of the westbound travelers. By 1986, the percentage of first-time visitors had again risen above the one-half mark, reaching 50.8 percent.

The proportion of visitors whose occupations were professional, technical, business, managerial, and official has increased, as has the proportion of retirees. Median family incomes of visitors has shown consistent increases over the years, in part reflecting inflationary effects. The estimated median family income of visitors in 1983, the latest year for which data is available, was \$41,000, more than double the \$18,300 estimated for 1970.

A significant change has also occurred in the type of accommodations being used. In 1986, 32.9 percent of respondents indicated they intended to stay in "Condominium" or "Hotel and Condominium," up from 0.8 percent in 1970 who indicated they intended to stay in a "Rented Home or Apartment." The percentage staying in all other categories of accommodations dropped, including those staying with friends and relatives.

### **3.3.3 Hawaii County Transient Accommodations**

Historically, Hilo and Kailua-Kona have contained most of the visitor plant facilities on the Big Island. From 1970 to February 1987, the total number of transient accommodation units in the county increased from 3,486 to 7,328, a gain of 110 percent. Occupied rooms increased only 96 percent during the same period, from an estimated 2,381 occupied units in 1970, to 4,675 units in 1986. Meanwhile, statewide tourism (both westbound and eastbound) increased by 221 percent, indicating that the County of Hawaii did not achieve its proportional share of growth as measured by occupied rooms.

TABLE II-2

VISITOR ESTIMATES AND FORECASTS  
COUNTY OF HAWAII  
1970-2000

| Year      | Westbound        |                    | Eastbound <sup>1</sup> |                    | Both Directions <sup>2</sup> |
|-----------|------------------|--------------------|------------------------|--------------------|------------------------------|
|           | Percent of State | Estimated Visitors | Percent of State       | Estimated Visitors | Estimated Visitors           |
| 1970      | 37.1             | 511,000            | --                     | --                 | --                           |
| 1971      | 39.8             | 569,000            | --                     | --                 | --                           |
| 1972      | 39.2             | 699,000            | --                     | --                 | --                           |
| 1973      | 36.7             | 759,000            | --                     | --                 | --                           |
| 1974      | 36.8             | 804,000            | --                     | --                 | --                           |
| 1975      | 37.3             | 823,000            | --                     | --                 | --                           |
| 1976      | 34.1             | 870,000            | --                     | --                 | --                           |
| 1977      | 32.2             | 890,000            | 18                     | 118,000            | 1,008,000                    |
| 1978      | 31.5             | 955,000            | 19                     | 121,000            | 1,076,000                    |
| 1979      | 28.5             | 895,000            | 19                     | 156,000            | 1,051,000                    |
| 1980      | 25.9             | 789,000            | 16                     | 142,000            | 931,000                      |
| 1981      | 22.7             | 675,000            | 17                     | 163,000            | 838,000                      |
| 1982      | 21.5             | 705,000            | 18                     | 174,000            | 879,000                      |
| 1983      | 21.8             | 740,000            | 16                     | 156,000            | 896,000                      |
| 1984      | 20.5             | 763,000            | 14                     | 158,000            | 921,000                      |
| 1985      | 18.8             | 697,000            | 12                     | 141,000            | 838,000                      |
| 1986      | 18.5             | 788,000            | 11                     | 148,000            | 936,000                      |
| Forecast: |                  |                    |                        |                    |                              |
| 1990      | 25.0             | 1,175,000          | 15                     | 225,000            | 1,400,000                    |
| 1995      | 28.0             | 1,484,000          | 18                     | 324,000            | 1,808,000                    |
| 2000      | 30.0             | 1,680,000          | 20                     | 440,000            | 2,120,000                    |

<sup>1</sup> Estimates through 1983 based upon surveys of Japanese visitors and the assumption that ten percent of other Eastbound visitors visit Hawaii County.

<sup>2</sup> Westbound only until 1977.

SOURCE: Hawaii Visitors Bureau, Annual Research Reports and Japanese Visitor Opinion Surveys; Ming Chew Associates.

Beginning in 1981, with the opening of the Sheraton Royal Waikoloa, the share of transient accommodations outside of Kona and Hilo (predominantly the Kohala Coast Resort Region) increased sizeably. By February 1983, with the opening of the Mauna Lani Bay Hotel, the proportion of units essentially on the Kohala Coast began to approach that in Hilo. Later, as a result of continued removal of units in the Hilo inventory for other uses, the total number of transient accommodation units in North and South Kohala exceeded for the first time the number in Hilo. Soon after, the number of occupied units, essentially on the Kohala Coast, exceeded the number of occupied units in Hilo. Occupancies in Kona have exceeded those in Hilo since 1975. Based upon earlier surveys conducted by the HVB, occupancies for visitor accommodations located outside Hilo and Kona had been generally higher than the islandwide averages.

Significantly, much of the visitor plant in Hilo and Kona had been oriented toward group travelers, which represented 47 percent of westbound visitors to the State in 1974, and only 15 percent in 1986.

### **3.3.4 Forecast of Demand for Transient Accommodations**

The demand for transient accommodations in Hawaii has expanded dramatically due to rapid growth of tourism in the State. Increases in discretionary leisure time and income, as well as reduced travel costs and travel times, have substantially broadened the market area from which patronage can be drawn. Each delineated market segment now has grown significantly to support a wide variety of accommodations, as well as recreation and amusement facilities.

The transient accommodations market is highly segmented with each specific segment having different requirements. This allows operators to either focus attention on capturing a narrow segment of the market or attempt to appeal to all segments, but with a potential loss of efficiency. Market segmentation also allows facilities catering to different classifications of patrons to co-exist in an area so long as each segment is of an economic size. Aggregations of facilities in a single locale add to the area's cumulative attraction. This increases the likely draw to the area and makes more viable each of the entities operating therein. Variety, quality, and quantity of both amenities and facilities are all very important when trying to merchandise transient accommodations to broad market segments.

#### **3.3.4.1 Methodology**

Market analysis is accomplished by comparing factors of demand with factors of supply. First, patterns of historical demand are evaluated, and then statewide demand projected. State demand is delineated after analyzing the relative attractions of each island and its respective resort regions. The current and anticipated supply of competitive facilities is compared with the delineated demand, and differences between supply and demand are used to identify the prospects for new developments.

#### **3.3.4.2 Supply Factors**

Table II-3 summarizes the number and location of transient accommodations on the Big Island by price range. Units in Hilo, comprising 22 percent of the total number of units on the island, have published rates up to \$74, whereas the preponderant range in Kona is between \$50 and \$149 (53% of the island total).

Table II-3

SUMMARY OF PRIMARY TRANSIENT  
ACCOMMODATIONS BY PRICE RANGE (1)  
County of Hawaii  
1987

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| District<br>or<br>Region     | Units<br>(2) | Less<br>Than<br>\$50 | \$50-<br>\$74 | \$75-<br>\$99 | \$100-<br>\$149 | \$150-<br>\$199 | \$200+ | Estimated<br>Average<br>Published<br>Rate |
|------------------------------|--------------|----------------------|---------------|---------------|-----------------|-----------------|--------|-------------------------------------------|
| <u>Hilo</u>                  | 1,204        | 455                  | 749           | -             | -               | -               | -      | \$ 54                                     |
| Percent<br>of<br>total       | 22%          |                      |               |               |                 |                 |        |                                           |
| <u>Kona</u>                  | 2,940        | 196                  | 798           | 1,045         | 799             | 2               | 100    | \$ 93                                     |
| Percent<br>of<br>total       | 53%          |                      |               |               |                 |                 |        |                                           |
| <u>Kohala</u>                | 1,303        | 41                   | 58            | -             | 543             | -               | 661    | \$183                                     |
| Percent<br>of<br>total       | 24%          |                      |               |               |                 |                 |        |                                           |
| <u>Ka'u/<br/>Volcano</u>     | 83           | 50                   | 33            | -             | -               | -               | -      | \$ 49                                     |
| Percent<br>of<br>total       | 1%           |                      |               |               |                 |                 |        |                                           |
| Total                        | 5,530        | 742                  | 1,638         | 1,045         | 1,342           | 2               | 761    | \$105                                     |
| Percent<br>Distri-<br>bution | 100%         | 13%                  | 30%           | 19%           | 24%             | 0%              | 14%    |                                           |

- (1) Published rates for double occupancy superior for hotels and one-bedroom units for apartment/townhouses per night; rents may apply to studio units or cottages which were only type available.
- (2) Includes projects which are HVB members or which are managed by HVB members.

SOURCE: Ming Chew Associates

For Kohala, with 24 percent of the transient accommodation units on the island, the predominant range is \$100 and over, with the largest number in the \$200+ category.

### **3.3.4.3 Demand Factors**

#### **3.3.4.3.1 Comparison with Other Regions in the State**

Visitor forecasts made by Ming Chew Associates, particularly the higher Hawaii County growth rate, are based on the assumption that the Kohala Coast Resort Region will continue to experience substantial resort development during the next 13 years. Addition of such facilities will enhance the competitive position of the region relative to other parts of the island and of the State. The region itself must compete directly with other resort regions in Hawaii, so in order to delineate County demand forecasts, it is necessary to evaluate the potential attraction of the Kohala Coast Resort Region relative to other regions in the State.

From Table II-4 it can be seen that Maui contains the largest number of transient accommodations, with West Maui alone (Lahaina-Kaanapali-Kapalua) accounting for more units (7,929) than the total Hawaii County inventory. The resort region from Kihei to Makena currently ranks second to West Maui (4,810 units). Much of Maui's attraction results from the quantity, quality, and diversity of activities and amenities, including extensive sand beaches and golf courses, as well as over a decade of coordinated promotion of the island as a resort destination area.

Kona is the third largest neighbor island resort region (4,486 units), but except for its boat harbors, the amount of recreational amenities such as golf courses is relatively limited, particularly in relationship to the inventory of accommodations.

At present, North and South Kohala contain a reported 1,422 transient accommodation units--almost 900 added in 1981 with the construction at Waikoloa and Mauna Lani. The 1,260-room Hyatt Waikoloa Hotel "super-resort" is under construction and scheduled to open in late 1988. A total of four championship golf courses now exist, as many as in the West Maui resort region. The Kohala Coast Resort Region compares very favorably with other regions in the State in terms of "sun, surf and sand," complementary accommodations and recreational facilities, good accessibility, and the high quality of its existing beach resorts.

#### **3.3.4.3.2 Forecast of Island Demand**

Table II-5 shows Ming Chew Associates' forecast of transient accommodation demand for Hawaii County through 2000, delineated by westbound, eastbound, and intrastate travelers. Total room demand in terms of occupied units was estimated to be 4,700 units in 1986 (64% occupancy). Demand is projected to increase to 8,000 units by 1990, 11,500 units by 1995, and 14,700 units by 2000.

Ming Chew Associates projects that the demand for transient accommodations in North and South Kohala will increase from 1,400 units in 1986, to 7,900 in 2000 (see Table II-6). When compared to existing supply, North and South Kohala will need an additional 6,500 units by 2000. This can be compared with projections for Kona--an increase from 4,100 units in 1986, to 9,800 in 2000. In terms

Table II-4

DISTRIBUTION OF NEIGHBOR ISLAND  
TRANSIENT ACCOMMODATIONS BY  
MAJOR RESORT REGIONS  
State of Hawaii  
1987

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|                                           | <u>Transient<br/>Accommodation<br/>Units(1)</u> | <u>Golf Courses(2)</u> |
|-------------------------------------------|-------------------------------------------------|------------------------|
| <u>Hawaii:</u>                            |                                                 |                        |
| North and South Kohala (3)                | 1,422                                           | 4                      |
| Kona                                      | 4,486                                           | 1 (27 holes)           |
| Other (including Hilo)                    | <u>1,420</u>                                    | 5 (two 9-hole)         |
| Total                                     | 7,328                                           |                        |
| <u>Maui:</u>                              |                                                 |                        |
| West Maui (Lahaina,<br>Kaanapali, Napili) | 7,929                                           | 4                      |
| Kihei-Wailea-Makena                       | 4,810                                           | 3                      |
| Other (Including Kahului)                 | <u>525</u>                                      | 2                      |
| Total                                     | 13,264                                          |                        |
| <u>Molokai:</u>                           | 575                                             | 1                      |
| <u>Kauai:</u>                             |                                                 |                        |
| Wailua-Kapaa                              | 2,721                                           | 1                      |
| Poipu                                     | 1,872                                           | 1                      |
| Hanalei                                   | 1,137                                           | 1 (27 holes)           |
| Other (Including Lihue)                   | <u>226</u>                                      | 1 (9-hole)             |
| Total                                     | 5,956                                           |                        |

(1) As of February 1987.

(2) Open to the public.

(3) Mainly the Kohala Coast Resort Region

SOURCE: Ming Chew Associates

Table II-5

FORECAST OF TRANSIENT  
ACCOMMODATION DEMAND  
County of Hawaii  
1986 - 2000

|                      | <u>1986</u> | <u>1990</u> | <u>1995</u> | <u>2000</u> |
|----------------------|-------------|-------------|-------------|-------------|
| <u>Westbound:</u>    |             |             |             |             |
| Visitors             | 788,000     | 1,175,000   | 1,484,000   | 1,680,000   |
| Average Stay, Nights | 4.0         | 4.3         | 4.7         | 5.1         |
| Average Party Size   | 1.9         | 1.9         | 1.9         | 1.9         |
| Occupied Rooms       | 4,500       | 7,300       | 10,100      | 12,300      |
| <u>Eastbound:</u>    |             |             |             |             |
| Visitors             | 148,000     | 225,000     | 324,000     | 440,000     |
| Average Stay, Nights | 0.3         | 0.8         | 1.5         | 2.0         |
| Average Party Size   | 1.6         | 1.6         | 1.6         | 1.6         |
| Occupied Rooms       | (1)         | 300         | 800         | 1,500       |
| <u>Local:</u>        |             |             |             |             |
| Visitors             | 100,000     | 170,000     | 250,000     | 375,000     |
| Average Stay, Nights | 1.5         | 1.5         | 1.5         | 1.5         |
| Average Party Size   | 1.7         | 1.7         | 1.7         | 1.7         |
| Occupied Rooms       | 200         | 400         | 600         | 900         |
| <u>Total:</u>        |             |             |             |             |
| Visitors             | 1,036,000   | 1,570,000   | 2,058,000   | 2,495,000   |
| Average Stay, Nights | 3.2         | 3.5         | 3.8         | 4.0         |
| Average Party Size   | 1.9         | 1.9         | 1.9         | 1.9         |
| Occupied Rooms       | 4,700       | 8,000       | 11,500      | 14,700      |

(1) Less than 100

SOURCE: Ming Chew Associates.



Table II-6

PROJECTION OF TRANSIENT  
ACCOMMODATION DEMAND BY RESORT REGION  
County of Hawaii  
1986 - 2000

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|                                                            | <u>Hilo</u> | <u>Kona</u> | <u>Kohala</u> | <u>Other</u> | <u>Total<br/>County</u> |
|------------------------------------------------------------|-------------|-------------|---------------|--------------|-------------------------|
| <u>Occupied Units:</u>                                     |             |             |               |              |                         |
| 1986                                                       | 740         | 2,898       | 986           | 51           | 4,675                   |
| 1990                                                       | 1,000       | 4,200       | 2,500         | 300          | 8,000                   |
| 1995                                                       | 1,200       | 5,700       | 4,100         | 500          | 11,500                  |
| 2000                                                       | 1,400       | 6,900       | 5,500         | 900          | 14,700                  |
| <u>Estimated Total<br/>Demand at 70%<br/>Occupancy:(1)</u> |             |             |               |              |                         |
| 1986                                                       | 1,100       | 4,100       | 1,400         | 100          | 6,700                   |
| 1990                                                       | 1,400       | 6,000       | 3,600         | 400          | 11,400                  |
| 1995                                                       | 1,700       | 8,100       | 5,900         | 700          | 16,400                  |
| 2000                                                       | 2,000       | 9,800       | 7,900         | 1,300        | 21,000                  |
| <u>Visitor Plant<br/>Inventory:</u>                        |             |             |               |              |                         |
| February 1987                                              | 1,335       | 4,486       | 1,422         | 85           | 7,328                   |

(1) Rounded

SOURCE: Hawaii Visitors Bureau, Visitor Plant Inventory,  
February 1987; Ming Chew Associates.

of supply, Kona is projected to require only 5,300 additional units by 2000. Thus, the relative share of occupied units in Kona will continue to decline, as Kohala is expected to gain very rapidly in terms of the number of occupied units and market share on the island. Projections also show that Hilo's relative market position will continue to decline.

In general, it appears that market conditions in Kohala are in balance, and that Hilo and Kona are slightly over-supplied at present. Based upon projected demand, Hilo and Kona should reach market equilibrium shortly.

#### **3.3.4.4 Estimated Marketability of Transient Accommodations**

According to the projections shown here, demand will exist in North and South Kohala for another 2,200 units by 1990, 4,500 units by 1995, and 6,500 units by 2000. It is assumed that most of the demand will be satisfied in the Kohala Coast Resort Region--about 70 to 80 percent by Waikoloa, Mauna Lani, and Mauna Kea Properties projects. Ming Chew Associates forecasts that Mauna Kea Properties' projects will capture 20 percent of the projected new transient accommodations demand in the region, resulting in demand estimates of 400 units by 1990, 900 units by 1995, and 1,300 units by 2000.

At present, the Westin Mauna Kea accounts for 22 percent of the transient accommodations in North and South Kohala, and about 26 percent of the major hotel units. It is currently the smallest (310 rooms) of the three major hotels and expected to reach capacity in the very near future. This means that the Mauna Kea Resort itself will not be available to accommodate the projected future increases in net new demand for resort facilities in the region. Mauna Kea Properties' projects will probably capture slightly less than a pro rata share of the projected increases due to anticipated higher prices for their resort properties.

In terms of room rates, it is likely that a disproportionate share of the future market potential will be in the luxury and super-luxury ranges. The Sheraton Royal Waikoloa is characterized as a luxury project compared to the super-luxury Westin Mauna Kea and Mauna Lani Bay Hotel. The proposed South Kohala Resort will probably be closer in quality to its neighbor, the Westin Mauna Kea, with published daily room rates in excess of \$200. This assumes that the requisite amenities and service will be provided to warrant such rates. An "all suite" concept is envisioned for the South Kohala Resort hotel.

Therefore, with the aggregate promotional effort directed at a relatively narrow market segment, basic demand has a strong potential for expansion. It is estimated that, until recently, tens of thousands of dollars have been spent annually to advertise the area through the efforts of a single hotel. During the last few years, however, millions of dollars have been expended by the North and South Kohala resorts and hotels--resulting in a concentration of promotional programs that will likely modify the historical patterns of tourism activity on the Big Island. In the future, it is anticipated that a larger segment of the island's market will consist of the luxury and super-luxury components. This shift in market characteristics began with completion of the Sheraton Royal Waikoloa and has been accentuated by each major development since.

### 3.3.5 Forecast of Demand for Resort Multifamily Units

Resort multifamily units may be used by owners as primary residences, used on a short-term basis as transient accommodations, rented on a long-term basis for year-round residents, or used occasionally as second or vacation homes by owners and their guests. It is likely that many resort multifamily units in the proposed South Kohala Resort could be made available for short-term rental purposes, and the hotel could handle the required management functions. Resort homes usually develop in proximity to hotels, as return visitors often choose to retire in the locale or at least acquire property for their own use. Because of their ease of maintenance and relative security, multifamily units have become a very popular means of responding to this type of demand.

#### 3.3.5.1 Market Indicators

To project the demand for multifamily units in the proposed South Kohala Resort, it was necessary to begin with an analysis of the experience of resort multifamily unit sales in North and South Kohala and other comparable regions, including Kona, West Maui, and Kihei-Makena. Four projects in the Kohala Coast Resort Region provide some indicators that have aided in the analysis:

**Mauna Lani Terrace.** This fee simple project fronting an old Hawaiian fishpond and newly created lagoon consists of 80 units on a 13.3 acre site, resulting in an average development density of six units per acre. Prices range from \$275,000 to \$345,000 for the 18 one-bedroom units, \$355,000 to \$555,000 for the 54 two-bedroom units, and \$705,000 to \$895,000 for the eight three-bedroom units. The average unit price initially was about \$450,000. Sales began in August 1982, and construction was completed in 1983. A buyer analysis indicates that most of the purchasers were California residents. About 80 to 85 percent of the buyers had visited Kohala before and were familiar with the area, suggesting that many had been guests at the Westin Mauna Kea.

**The Villas at Mauna Kea.** The Villas consists of 40 one-story leasehold units on a 29.9-acre site surrounded by fairways of the Mauna Kea golf course and overlooking the Westin Mauna Kea. Development density is 1.3 units per acre. Sales of 23 units in the first increment began in early 1983, and all were sold by the end of the year. At present, the two remaining unsold units in the second phase are reserved and scheduled to close in the near future. Leasehold prices of the two-bedroom units ranged from \$800,000 to \$1,250,000, and the four-bedroom units from \$1,225,000 to \$1,450,000. The average unit price was slightly over \$1,000,000.

**The Shores at Waikoloa Beach Resort.** Sales of the 72-unit first increment in the 120-unit fee simple project began in January 1984. By April 1987, 66 units were sold. The Shores occupies an 11.4-acre fairway site located near the golf clubhouse. Prices currently range from \$195,000 for a one-bedroom unit to \$680,000 for a three-bedroom unit. The average price of units in the first increment is about \$350,000.

**Mauna Lani Point.** Overlooking two oceanfront fairways, this 116-unit project is similar to the Mauna Lani Terrace in terms of density and unit size. Sales began in 1985; construction was completed about the end of 1986. At present, about one-third of the units have been sold. Prices are higher than original

prices at Mauna Lani Terrace due mainly to inflationary effects. The 34 one-bedroom fee simple units average \$387,000, the 76 two-bedroom units average \$545,000, and the six three-bedroom units average \$835,000.

Ming Chew Associates has concluded that many of the Mauna Lani Terrace and Villas at Mauna Kea units were absorbed mainly by pent-up demand generated by the multiple return guests of the Westin Mauna Kea. Although the Westin Mauna Kea had been operating since 1965, no luxury units were offered for sale in the Kohala Coast Region until 1982.

To estimate the Kohala Coast market potential, the visitor plant inventory (accommodations available to visitors for transient use) in North and South Kohala and the other three resort regions (Kona, West Maui, and Kihei-Makena) was delineated into hotel units and multifamily units. The results show that North and South Kohala are just beginning to include multifamily units as a significant part of their inventory of transient accommodation.

### **3.3.5.2 Projected Demand for Multifamily Units in North and South Kohala**

Ming Chew Associates projects that the proportion of multifamily units used as transient accommodations will increase from about 29 percent in 1986, to 50 percent in 1990, and remain at that level to 2000. These projections are shown in Table II-7.

The table also shows the projected net demand in excess of the actual 1986 inventory. The North and South Kohala market appears to be in balance at present. By 1990, it is projected that there will be a net new demand for 1,500 hotel units and 700 multifamily units for transient use over and above the existing 1986 inventory. Thereafter, projected net new demand for both types of transient accommodations will continue to increase.

### **3.3.5.3 Projected Demand for Multifamily Units in the Proposed South Kohala Resort**

Earlier, it was estimated that the proposed South Kohala Resort could capture 20 percent of the potential demand for transient accommodations in the region. Ming Chew Associates assumes that this factor is applicable for both hotel and multifamily unit demand. Applying this capture rate to the North and South Kohala demand projections produces the results shown in Table II-8. Hence, there will be an estimated demand for 300 multifamily units at South Kohala Resort in 1990, 800 in 1995, and 1,400 in 2000.

Projections of achievable prices for multifamily units in the proposed project have been based largely on the prices achieved for properties in the three existing Kohala resorts. Table II-9 shows selected characteristics of these projects. In general, the Mauna Kea properties are the lowest in height and density, smallest in number, largest in area, and highest in price.

The South Kohala Resort land use concept plan shows multifamily projects on the golf fairways mauka of the Queen Kaahaumanu Highway. Although they will be removed from the ocean, their higher elevation and rolling terrain will provide these units with very attractive panoramic views of the ocean and coastline. Further, the proposed projects will be part of an integrated resort with a full range of resort amenities. The concept is similar to that

Table II-7

FORECAST OF NORTH AND SOUTH KOHALA  
MULTIFAMILY UNIT DEMAND  
County of Hawaii  
1986-2000

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| <u>Gross Demand Forecast</u>  | <u>Delineation of Projected Transient Accommodations Demand</u> |                |                    |             |                 | <u>Projected Total MF(1) Units</u> |                              |
|-------------------------------|-----------------------------------------------------------------|----------------|--------------------|-------------|-----------------|------------------------------------|------------------------------|
|                               | <u>Total Trans. Units</u>                                       | <u>% Hotel</u> | <u>Hotel Units</u> | <u>% MF</u> | <u>MF Units</u> | <u>in Trans. Use</u>               | <u>Projected Total Units</u> |
| 1986                          | 1,400                                                           | 88%            | 1,200              | 12%         | 200(2)          | 29%                                | 600                          |
| 1990                          | 3,600                                                           | 75             | 2,700              | 25          | 900             | 50                                 | 1,800                        |
| 1995                          | 5,900                                                           | 65             | 3,800              | 35          | 2,100           | 50                                 | 4,200                        |
| 2000                          | 7,900                                                           | 55             | 4,300              | 45          | 3,600           | 50                                 | 7,200                        |
| Actual Units in 1986(3)       | 1,400                                                           |                | 1,200              |             | 200             |                                    | 600                          |
| <u>Net Demand Forecast(4)</u> |                                                                 |                |                    |             |                 |                                    |                              |
| 1986                          | 0                                                               |                | 0                  |             | 0               |                                    | 0                            |
| 1990                          | 2,200                                                           |                | 1,500              |             | 700             |                                    | 1,200                        |
| 1995                          | 4,500                                                           |                | 2,600              |             | 1,900           |                                    | 3,600                        |
| 2000                          | 6,500                                                           |                | 3,100              |             | 3,400           |                                    | 6,600                        |

(1) Multifamily

(2) Rounded

(3) Rounded. Based upon inventory reported in February 1987.

(4) Gross demand forecast, less actual units in 1986.

SOURCE: Ming Chew Associates

Table II-8

FORECAST OF SOUTH KOHALA RESORT HOTEL AND  
MULTIFAMILY UNIT DEMAND(1)  
Kohala Coast Resort Region  
County of Hawaii, State of Hawaii  
1990-2000

| <u>Net Increase<br/>From 1986</u> | <u>Projected Transient<br/>Accommodations Demand</u> |                        | <u>MF(2)<br/>Units<br/>For Other<br/>Uses</u> |     | <u>Total<br/>MF Units<br/>For Trans.<br/>Accom. and<br/>Other Uses</u> |
|-----------------------------------|------------------------------------------------------|------------------------|-----------------------------------------------|-----|------------------------------------------------------------------------|
|                                   | <u>Total</u>                                         | <u>Hotel<br/>Units</u> | <u>MF<br/>Units</u>                           |     |                                                                        |
| 1990                              | 450                                                  | 300                    | 150                                           | 150 | 300                                                                    |
| 1995                              | 900                                                  | 500                    | 400                                           | 400 | 800                                                                    |
| 2000                              | 1,300                                                | 600                    | 700                                           | 700 | 1,400                                                                  |

(1) Estimated to be 20 percent of North and South Kohala Demand.

(2) Multifamily

SOURCE: Ming Chew Associates

Table II-9

SELECTED RESORT MULTIFAMILY  
PROJECT CHARACTERISTICS  
Kohala Coast Resort Region  
County of Hawaii, State of Hawaii

| <u>Project</u>                         | <u>Frontage</u>        | <u>Height</u>      | <u>Density</u><br><u>un./ac.</u> | <u>Number</u><br><u>of</u><br><u>Units</u> | <u>Average</u><br><u>Size</u><br><u>Sq.Ft.(1)</u> | <u>Average Price</u>     |
|----------------------------------------|------------------------|--------------------|----------------------------------|--------------------------------------------|---------------------------------------------------|--------------------------|
| <u>Mauna Kea Resort</u>                |                        |                    |                                  |                                            |                                                   |                          |
| The Villas                             | Golf Fairway           | 1-Story            | 1.3                              | 40                                         | 4,100                                             | \$1,000,000(LH)          |
| The Estates(2)                         | Golf Fairway           | 1-Story            | 0.5-0.6                          | 27-30                                      | 4,700                                             | not established          |
| <u>Mauna Lani Resort</u>               |                        |                    |                                  |                                            |                                                   |                          |
| Mauna Lani Terrace                     | Lagoon                 | 3-Story            | 6.0                              | 80                                         | 1,800                                             | \$450,000                |
| Mauna Lani Point                       | Ocean/<br>Golf Fairway | 3-Story            | 6.3                              | 116                                        | 1,750                                             | \$514,000                |
| <u>Waikoloa Beach Resort</u>           |                        |                    |                                  |                                            |                                                   |                          |
| The Shores                             | Golf Fairway           | 1-, 2-,<br>3-Story | 10.5                             | 120                                        | 1,700(3)                                          | \$350,000(3)             |
| <u>Proposed South Kohala Resort(4)</u> |                        |                    |                                  |                                            |                                                   |                          |
| Mauka Projects                         | Golf Fairway           | 2-Story            | 4-5                              | Vari-<br>ous                               | 2,000                                             | \$500,000 -<br>\$600,000 |

(LH) - Leasehold

(1) Includes lanai and deck areas.

(2) Preliminary data.

(3) Increment 1 (72 units).

(4) Recommended characteristics and potential prices.

SOURCE: Ming Chew Associates

of the Mauna Kea Resort. As a result, it is estimated that condominium units averaging about 2,000 square feet in area, including lanais, with a recommended overall density of about four to five units per acre, could potentially achieve prices averaging \$500,000 to \$600,000 in fee simple. These prices are higher than The Shores at Waikoloa, which has a higher density and less panoramic views. They are about the same as the average for resales at Mauna Lani Terrace and Mauna Lani Point, both of which are closer to the ocean, but which have higher densities.

### **3.3.6 Forecast of Demand for Subdivision Houselots**

Resort subdivision houselots respond to market demands for vacation homes, investment properties, and permanent residences. They may be improved with houses shortly after purchase or held for many years before being improved. Thus, this segment consists not only of the demand for houselots but also for house and lot packages.

#### **3.3.6.1 Market Indicators**

Currently, the only resort subdivision houselots in the Kohala Coast Resort Region are The Fairways at Mauna Kea South (33 lots) and The Fairways at Mauna Kea North (32 lots). Fairways South consists of lots ranging in size from 10,000 to 15,000 square feet, with an overall project density slightly less than 0.5 lots per acre. These lots were initially offered in the early 1970s and have all been sold on a leasehold basis. Over two-thirds are improved and other homes are being planned. About 25 percent of the homes are occupied full-time. Fairways North lots, a minimum of 22,000 square feet, are clustered together, with each cluster surrounded by extensive open space. Overall density is about 0.8 lots per acre. The leasehold lots were offered for sale beginning in late 1982 for prices ranging from \$175,000 to \$500,000, or an average price of \$365,000. As of early May 1987, only 13 lots remained unsold.

#### **3.3.6.2 Projected Demand for Houselots**

Ming Chew Associates forecasts a demand in the proposed South Kohala Resort for 30 houselots in 1990, 80 in 1995, and 140 in 2000. The demand analysis is based mainly on the general experience of the Mauna Kea Resort, including the results of a study which evaluated the marketability of The Villas and The Fairways at Mauna Kea North (Hastings, Martin, Chew & Associates, Ltd., March 1981). See Table II-10 where Ming Chew Associates projects a 10 percent demand for houselots.

Achievable prices are estimated to be \$300,000 to \$350,000 for the makai subdivision lots and \$175,000 to \$225,000 for the mauka lots (both fee simple). This assumes a development density of about one unit per acre in the makai subdivision and two units per acre in the mauka subdivision. Thus, the proposed subdivision projects will be more dense and less expensive than the existing Mauna Kea Resort projects.

#### **3.3.6.3 Projected Demand for House and Lot Packages**

It is anticipated that a number of buyers will seek pre-designed and pre-constructed houses; they may want customized houses but will prefer to bypass the design and construction phases. The survey of persons interested in



Table II-10

FORECAST OF SOUTH KOHALA RESORT  
SUBDIVISION HOUSELOT DEMAND  
Kohala Coast Resort Region  
County of Hawaii, State of Hawaii  
1990-2000

|      | <u>Projected Total<br/>Multifamily<br/>Unit Demand(1)</u> | <u>Estimated Ratio<br/>of Resort<br/>Houselot Demand</u> | <u>Estimated Resort<br/>Houselot Demand</u> |
|------|-----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------|
| 1990 | 300                                                       | 0.1                                                      | 30                                          |
| 1995 | 800                                                       | 0.1                                                      | 80                                          |
| 2000 | 1,400                                                     | 0.1                                                      | 140                                         |

(1) Increase from 1986.

SOURCE: Ming Chew Associates

properties at Mauna Kea indicated that twice as many were interested in a "detached home and lot" as were interested in a "house/lot." However, as the choice of resort residential properties in the region increases, it is likely that the relative proportion of buyers seeking a house and lot package will decline to approximately the same portion that would purchase house/lots alone.

Therefore, the projections appearing in Table II-10 would also represent, numerically, the demand estimates for house and lot packages: 30 houses by 1990, 80 by 1995, and 140 by 2000. The estimated average fee simple prices for house and lot packages in the makai subdivision is \$800,000 to \$1,200,000, and from \$600,000 to \$800,000 in the mauka subdivision. This is based on the assumption that prices for house and lot packages will be, in general, about one-fourth to one-third more than for similar-sized attached multifamily units.

### **3.3.7 Forecast of Demand for Golf Course**

To support the golf demand generated in the proposed South Kohala Resort by 1990, an associated 18-hole high-quality championship golf course will be needed within the resort by the time the proposed beach hotel begins operation. Ming Chew Associates forecasts a demand for 43,000 annual rounds by 1990, 72,000 annual rounds by 1995, and 128,000 annual rounds by 2000. The golf course demand analysis was accomplished by examining the Mauna Kea experience, since the South Kohala Resort is to be a self-contained resort with high-quality amenities similar to those at Mauna Kea Resort.

As shown in Table II-11, the number of rounds at the Mauna Kea golf course declined steadily from 1978 to 1982, and then rebounded sharply by 1986. Since 1982, both the number of rounds of golf at Mauna Kea and the number of westbound intended visitors have increased, but the number of Mauna Kea golf rounds has increased more rapidly.

Representatives of Mauna Kea have indicated that for the image and character desired of the golf course, the number of annual rounds should not exceed 45,000. Thus, Mauna Kea reached its maximum desired level in 1985, and exceeded it in 1986. Playing capacity may be currently available at Waikoloa and Mauna Lani, but it will soon be filled as occupancies increase in the associated hotels and as more accommodations are constructed at each resort.

Many guests are at the Mauna Kea Resort largely for golf, due to the golf course's reputation developed over the years (it is ranked in the top 100 by Golf Digest). Therefore, the ratio of golf rounds per room at the resort is thought to be unusually high. Ming Chew Associates estimates that the golf activity generated by the proposed South Kohala Resort might be about one-third less than at Mauna Kea. At this level of activity, the proposed hotel will generate 100 annual rounds per room. Assuming 350 rooms, there will be a demand for about 35,000 rounds of golf per year when the hotel achieves normal operations.

In addition, the proposed multifamily units and detached homes are expected to produce a demand of about 8,000 annual rounds of golf -- about one-fourth of that generated by hotel units in the type of resort proposed. Thus, the total golf demand by 1990 will be about 43,000 annual rounds.

Table II-11

MAUNA KEA GOLF COURSE ACTIVITY  
 MAUNA KEA RESORT  
 Kohala Coast Resort Region  
 County of Hawaii, State of Hawaii  
 1978 - 1986

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| <u>Year</u> | <u>Annual<br/>Number<br/>of Rounds</u> | <u>Annual Rounds<br/>Per Room(1)</u> | <u>Average<br/>Daily<br/>Rounds</u> |
|-------------|----------------------------------------|--------------------------------------|-------------------------------------|
| 1978        | 51,100                                 | 165                                  | 140                                 |
| 1979        | 47,600                                 | 154                                  | 130                                 |
| 1980        | 47,500                                 | 153                                  | 130                                 |
| 1981        | 43,700                                 | 141                                  | 120                                 |
| 1982        | 38,800                                 | 125                                  | 106                                 |
| 1983        | 39,700                                 | 128                                  | 109                                 |
| 1984        | 40,300                                 | 130                                  | 110                                 |
| 1985        | 47,200                                 | 152                                  | 129                                 |
| 1986        | 53,500                                 | 173                                  | 147                                 |

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(1) At the Westin Mauna Kea

SOURCE: Westin Mauna Kea; Ming Chew Associates

This amount of activity could not be accommodated at the adjacent Mauna Kea golf course, which is already beyond its desired maximum capacity. In fact, due to general increases in the demand for golf at Mauna Kea and the inability of the existing courses in the region to absorb the demand, it is conceivable that the overflow will go to the proposed South Kohala Resort course.

### **3.4 PROJECT SCHEDULE AND CONSTRUCTION COST**

The proposed construction schedule for South Kohala Resort is shown in Table II-12. Construction of the golf course, beach club, and tennis complex is scheduled to start in 1990 and to be completed by 1992. It has been determined that a simultaneous opening of the hotel, golf course, and club house is critical to the success of the resort. Therefore, the proposed golf facility is scheduled to be completed within the year prior to the hotel opening. (The hotel will be constructed between 1991 and 1993).

The estimated construction cost for the proposed resort is \$328,825,000, including an estimated \$105,000,000 for the luxury hotel, tennis club, and hotel grounds landscaping, and \$12,250,000 for the golf course and clubhouse. The remainder of the projected cost is for the residential units, beach club, community recreation center, resort offices, infrastructure, and landscaping. No land cost is included. Estimates are based on 1987 dollars. See Table II-13 for a breakdown of estimated construction costs.

Table II-12

Development Schedule  
Proposed South Kohala Resort

| <u>Project</u>                             | <u>Number of Units Completed<br/>by Time Period</u> |                    | <u>Total Proposed<br/>Units/Holes</u> |
|--------------------------------------------|-----------------------------------------------------|--------------------|---------------------------------------|
|                                            | <u>1988 - 1993</u>                                  | <u>1993 - 1998</u> |                                       |
| Golf Course and Clubhouse                  | 18 Holes <sup>1</sup>                               |                    | 18 Holes                              |
| Beach and Tennis Club                      | Complete                                            |                    | NA                                    |
| Infrastructure - Makai                     | Complete                                            |                    | NA                                    |
| Infrastructure - Mauka                     | Complete                                            |                    | NA                                    |
| Hotel                                      | 350 <sup>2</sup>                                    |                    | 350                                   |
| The High Bluffs - Makai<br>(Single-Family) | 5                                                   | 5                  | 10                                    |
| Single-Family Residential - Mauka          | 10                                                  | 90                 | 100                                   |
| Multifamily Residential - Mauka            |                                                     | 450                | 450                                   |

<sup>1</sup> Construction of golf course and beach and tennis club is projected to be completed in 1992.

<sup>2</sup> Construction of hotel is projected to be completed in 1993.

Source: Mauna Kea Properties, Inc., Ming Chew Associates, and Belt Collins & Associates.

Table II-13

Construction Cost Estimates<sup>1</sup>  
South Kohala Resort

| P r o j e c t                                            | Estimated<br>Construction<br>Cost |
|----------------------------------------------------------|-----------------------------------|
| Hotel (350 rooms) and Tennis Club, Including Landscaping | \$105,000,000                     |
| High Bluffs SF Residential (10 units) <sup>2</sup>       | 6,000,000                         |
| Mauka MF Residential (450 units)                         | 138,000,000                       |
| Mauka SF Residential (100 units) <sup>2</sup>            | 39,000,000                        |
| Golf Course, Driving Range & Golf Course Irrigation      | 9,750,000                         |
| Golf Clubhouse                                           | 2,500,000                         |
| Beach Club                                               | 1,000,000                         |
| Halfway Station                                          | 500,000                           |
| Recreation Center                                        | 2,500,000                         |
| Resort Offices                                           | 500,000                           |
| Infrastructure, Including Roads and Utilities            | 18,550,000                        |
| Water                                                    | 4,800,000                         |
| Landscaping for Roadways and Resort Entry                | <u>725,000</u>                    |
| TOTAL                                                    | \$328,825,000                     |

<sup>1</sup> All costs are order-of-magnitude in 1987 dollars.

<sup>2</sup> Although some lots will be sold without improvements, estimated costs are for house and lot packages.

SOURCE: Mauna Kea Properties, Inc. and Belt Collins & Associates.

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## *CHAPTER III*

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## CHAPTER III

### ALTERNATIVES TO THE PROPOSED ACTION

#### 1.0 INTRODUCTION

Chapter 200 of Title 11, Department of Health Environmental Impact Statement Rules, states that "The draft EIS shall contain any known alternatives for the action. These alternatives which could feasibly attain the objectives of the action (emphasis added) -- even though more costly -- shall be described and explained as to why they were rejected."

The proposed action is to provide shoreline improvements as an integral part of the proposed South Kohala Resort, a luxury resort development to be constructed both mauka and makai of Queen Kaahumanu Highway. A Shoreline Setback Variance permit is being sought to allow these shoreline improvements and a Special Management Area permit is being sought concurrently for the development of that portion of the resort in the SMA area, seaward of Queen Kaahumanu Highway.

A distinction should be made between the proposed action and the proposed project, which is the development of the entire South Kohala Resort. The objective of the action is to make improvements to the shoreline area which would enhance the resort and be in keeping with the prevailing character of the resort. The overall long-term objective is to develop an economically viable luxury resort community on the proposed South Kohala Resort site.

Various alternatives were considered but most were rejected as not attaining the objectives of the action and the project. One alternative which would not attain the objective of the action, but which would essentially allow the attainment of the objective for the project at the proposed site (although not as effectively) is the development of the resort without shoreline improvements in the 40-foot shoreline setback area. This alternative as well as those considered but rejected are described below.

#### 2.0 ALTERNATIVES CONSIDERED

##### 2.1 **PROPOSED ACTION: DEVELOPMENT OF SHORELINE IMPROVEMENTS AS PART OF TOTAL RESORT DEVELOPMENT**

The proposed action, as well as the South Kohala Resort project are described in detail in Chapter II of this report. The project consists of a luxury-class hotel, tennis complex, 18-hole championship golf course and clubhouse, multifamily and single-family residential units, unimproved lots, beach club, community recreation center, support and maintenance facilities, shoreline improvements, and roadway improvements including those in the public right-of-way.

The applicant proposes to extend the resort landscaping into the 40-foot shoreline setback area to provide a visual transition between developed sites and the natural shoreline. Work will include clearing, grubbing, grading, and planting, as well as installation of an irrigation system. Portions of the



existing public beach access nature trail, also within the setback, will be improved to include low-level lighting for night-time safety, paving and steps where appropriate (also for safety), and overhead trellises. Ancillary features -- such as signage, rubbish receptacles, seating, and planters -- are proposed to facilitate maintenance of the shoreline area and enhance its use.

This action is considered the best alternative for viable use of the South Kohala Resort lands. It is expected that any potential significant adverse impacts can be reduced to minimal levels through implementation of the proposed mitigation measures.

## **2.2 "NO ACTION" ALTERNATIVES**

### **2.2.1 Resort Development Without Shoreline Improvements**

Under this alternative, the project would proceed without the Shoreline Setback Variance permit necessary for implementing the proposed shoreline improvements. The effect would be to maintain the "natural" character of the shoreline, but pedestrian access along the shoreline would not be as safe and access to the beach from the adjacent hotel parcel would be more difficult. Visually, there would be an abrupt change from kiawe growth to the landscaped hotel grounds. The overall resort impacts would be almost the same as those of the "proposed action" alternative described above. The developer would still be able to achieve its objective in general, albeit without an enhanced shoreline transition.

From an operational viewpoint, maintenance of the existing overgrown kiawe would be less desirable. From a marketing viewpoint, the more difficult path to the beach for hotel guests would again be less desirable.

### **2.2.2 No Shoreline Setback Variance Granted and State Condemns Hotel Parcel**

This alternative entails condemnation of the hotel parcel adjacent to the sand beach, which precludes private resort development on the site. Without the possibility of development on the parcel planned for hotel development, it is unlikely that development of South Kohala Resort on the remainder of the land would be economically feasible. A luxury resort/residential community without an oceanfront hotel as a focal point has not proven to be a viable concept in Hawaii.

Under this alternative, if the hotel site were to remain undeveloped, existing views from the beach would be preserved, and the possibility of "intrusion" impacts on Hapuna Beach would be eliminated (although congestion of Hapuna Beach State Park may still become a problem, given other developments in the region). The resort would lack a focal point and would not be able to achieve its objective and no further expenditures would be required. At the same time, any economic benefits to be derived from development of the hotel site (as well as the other resort parcels) would not be realized, and the State would incur considerable cost to condemn the property. No additional sand beach area would be available to the State for park development, whereas the alternate governmental expenditure of funds for providing access to and developing a beach area elsewhere would achieve an increase in the island inventory of publicly accessible sand beach.

This alternative is highly unlikely since the resort lands are appropriately zoned on both the State and County levels and planning permits have been obtained.

### **2.2.3 Project Abandoned and Land Left Vacant**

There would be no physical impacts from this alternative. Views would be preserved and impacts on Hapuna Beach avoided. However, Mauna Kea Properties, owner of the currently resort zoned hotel lands, would be adversely affected economically. Likewise, revenues that would otherwise have been generated by the development would be lost to the State and County, and benefits related to increased employment opportunities would not be realized.

### **2.2.4 Project Abandoned and Land Sold to State or County**

Impacts would be similar to alternative 2.2.3 above, except that the landowner would be able to recoup the fair market value of its investment. The State or County would incur the added cost of acquiring, developing, and maintaining the property.

### **2.2.5 Project Abandoned and Land Sold to Another Private Entity**

Since the property is designated in the County General Plan for resort use, and all the appropriate zoning approvals have been obtained, any buyer would most likely proceed with plans for resort development. The impacts would be essentially the same as those of the proposed action. If the buyer decided to develop a higher density resort, then many of the impacts would be more severe (see 2.3 below).

## **2.3 HIGHER DENSITY RESORT DEVELOPMENT WITH OR WITHOUT SHORELINE SETBACK VARIANCE**

County zoning allows development of the project site at a much higher density than proposed; the maximum number of rooms allowed is 1,100. Although more jobs would be created, this alternative was rejected for a number of reasons. It would be contrary to the objective of developing an economically viable luxury resort. A high-density, non-luxury resort would not be in character with the neighboring resorts in South Kohala. The impacts would be more severe: higher population growth, increased housing needs, amplified effects on views and beach use, larger requirements for public services, higher water demand, possible degradation of coastal water quality, etc.

## **2.4 DIFFERENT RESORT LAYOUT**

Another alternative is to site the hotel and amenities away from the shoreline area. Under this alternative, views and beach use may still be altered but the impacts of having the hotel closer to the beach would be lessened. Under this alternative, there would be impacts on makai views from Queen Ka'ahumanu Highway. While the hotel would be further from the shoreline, it would be more prominent because of the higher elevation. This alternative was rejected because it is not viable for a luxury resort in Hawaii to be located away from the ocean. To be competitive with other luxury hotels, South Kohala Resort requires shoreline views and access to a beach area. There is no other parcel within the South Kohala Resort boundaries which would meet this requirement.

Two other layouts for the hotel have been considered and rejected; it has been suggested that the hotel site be relocated either to the elevated rocky shoreline between Hapuna and Kauna'oa Bays or to the south end of Kauna'oa Bay.

First, locating the hotel between Hapuna and Kauna'oa Bays would not be a viable alternative for the same reasons given above. The buildings would have a much greater visual impact, affecting views from both the beach park and the highway, and the hotel would be located away from the beach. Furthermore, the view of the ocean from lands mauka of the hotel would be blocked. The parcel in question is no longer part of the South Kohala Resort project. It is zoned for residential use, not for resort use.

The second suggestion is not viable for several reasons. The site is not part of the project application. The south end of Kauna'oa Bay, currently occupied by the golf course and other Mauna Kea Resort facilities, does not have the 32 acres required to accommodate the planned hotel, parking, tennis complex, and other amenities. Even if there was sufficient space in that site, a hotel located there would not relate to the planned golf course and clubhouse, which are considered an integral part of the hotel complex.

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## CHAPTER IV

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## CHAPTER IV

### DESCRIPTION OF THE AFFECTED ENVIRONMENT AND PROBABLE ENVIRONMENTAL CONSEQUENCES -- PHYSICAL ENVIRONMENT

#### 1.0 PHYSIOGRAPHY, GEOLOGY, SOILS AND CLIMATE

#### 1.1 EXISTING CONDITIONS

##### 1.1.1 Physiography

The site of the proposed South Kohala Resort is located on the lower northwest flank of Mauna Kea (13,796 feet), the second oldest of the Big Island's five volcanoes. The gently sloping form of a prehistoric flow is interspersed with a few scattered erosional gulches, and elevations range from sea level to approximately 600 feet above sea level near the mauka boundary. Running mauka-makai, slopes average 6 to 12 percent.

Kauna'oa and Hapuna Bays, two coastal features adjacent to the project site, have substantial beach sand deposits. The rest of the shoreline is either rocky or has a thin veneer of beach sand overlying rocks. The shoreline area at Hapuna is characterized by low sea cliffs of approximately 10 to 20 feet and low-lying, almost flat sandy areas.

##### 1.1.2 Geology

The Island of Hawaii was formed by lava flows from the Kohala Mountains (5,480 feet), Mauna Kea (13,796 feet), Hualalai (8,271 feet), Mauna Loa (14,677 feet), and Kilauea (4,040 feet). Kohala Volcano is considered by many to be extinct. Mauna Kea, whose flows cover the area south of the Kohala Mountains, has not erupted in historic times and is considered dormant rather than extinct. The probability of eruption is considered slight. Hualalai, located in the North Kona District, last erupted in 1800 and 1801. Mauna Loa and Kilauea, located on the southern half of the island, are both highly active volcanoes. Mauna Loa has had 36 eruptions in historic times, the most recent in 1984. Only the 1859 eruption flowed to the South Kohala coastline and reached the sea just south of Anaeho'omalua Bay. Currently active Kilauea has had more than 50 to 60 eruptions in historic times.

The site of the proposed South Kohala Resort is underlain primarily by pahoehoe lava from Mauna Kea's Hamakua Volcanic Series.

The United States Geological Survey (USGS) has assessed the relative risk from volcanic hazards for areas on the Island of Hawaii (Mullineaux and Peterson, 1974). Their classification includes six degrees of risk labeled "A" through "F", with "A" representing the lowest risk and "F" the highest. The South Kohala Resort site is within the USGS Relative Risk Zone B, and the probability of Mauna Kea erupting is very low.

In terms of seismicity, the entire Big Island is susceptible to earthquakes originating in fault zones under and adjacent to it. For the purpose of structural design, the island is classified as a Zone 3 area. The Hawaii

County building code requires that all new structures be designed to resist forces that might be expected in Zone 3 areas.

### 1.1.3 Soils

Soil on the project site is of the Red Desert Great Soils Group in the Kawaihae soil series. Derived from volcanic ash, it is dark brown, medium textured, moderate deep to deep, rocky, and well drained. Kawaihae soils are used mainly for pasture, recreation areas, wildlife habitats, and homesites. Annual rainfall is low -- 5 to 20 inches -- most of which falls in the winter months, and the natural vegetation includes kiawe, piligrass, ilima, and fingergrass.

Specifically, the soil at the project site is classified by the United States Department of Agriculture Soil Conservation Service (USDA-SCS) as "Kawaihae extremely stony very fine sand loam, 6 to 12 percent slope (KNC)" (USDA-SCS, December 1973). This soil type typically has a very thin surface layer, about two inches, of dark reddish-brown, extremely stony, very fine sandy loam. Beneath this layer is dark reddish-brown and dusky-red stony silt loam and loam, and at a depth of about 33 inches is a hard pahoehoe lava bedrock. The surface layer is neutral, and the subsoil is neutral to mildly alkaline. Certain areas, about 20 percent of the mapping unit, may be underlain by fragmented a'a lava. Permeability of the upper layer soil is moderate, runoff is medium, and the erosion hazard is moderate. Roots can penetrate to bedrock.

According to the USDA-SCS, soil on the property is not suited for agricultural use. The capability classification of the soil type is "VIIIs" in a classification system which rates the suitability of soils for most field crops on a scale of I to VIII. A rating of VII indicates a soil with severe limitations that make it unsuited to cultivation; the subscript "s" indicates that the main limitation is shallow, droughty, or stony conditions. Class VII soils are usually restricted to pasture or range, woodland, or wildlife. The USDA-SCS assigns soils in the Kawaihae series to Pasture Group 1, among the least productive of the 14 pasture groups.

The proposed South Kohala Resort will have about 600 feet of frontage adjacent to Hapuna Beach. Beaches are classified "VIIIw" by the Soil Conservation Service; this means that they have limitations which preclude their use for commercial plants. The limitation is water in or on the soil that interferes with plant growth.

The University of Hawaii Land Study Bureau classifies soils on the project site as Land Type 93, Kawaihae soils series (H.L. Baker et.al., November 1965). This land type is rocky, very well drained, arid, and unsuitable as to machine tillability. Its Master Productivity Rating, which is an indicator of overall land productivity, is "E" on a scale ranging from "A" to "E". An "E" rating signifies that the land type is very poorly suited for agricultural use. In terms of grazing use for pasture, it is assigned to Class "e", which designates lands with the lowest carrying capacity -- more than 30 acres per AUY (animal unit year), or estimated live beef gains of nine pounds or less per acre per year. (Compare this with Class "a": carrying capacity less than 2.5 acres per AUY or estimated live beef gains 110 lbs. per acre per year or greater.)

The Hapuna Beach portion of the resort site is classified as Land Type 327, Sands (regasols), by the Land Study Bureau. Its Master Productivity Rating is "E."

Thus, development of the South Kohala Resort will not have an impact on the actual or potential agriculture productivity of the site, which is currently unused and not suited to agricultural production.

#### 1.1.4 ALISH Classification

Three classes of agriculturally important lands have been established within the Agricultural Lands of Importance to the State of Hawaii (ALISH) system: (1) Prime Agricultural Land, (2) Unique Agricultural Land, and (3) Other Important Agricultural Land. Due to its unsuitability for agriculture, none of the land within the proposed project site is classified in the ALISH system.

#### 1.1.5 Climate

The Kawaihae area of South Kohala, where the proposed project site is situated, is one of Hawaii's driest localities. Average annual rainfall at the Weather Bureau's Puako gauge is about nine inches. Most of this rainfall typically occurs during a few storms in the October-to-April winter season, with one or two unseasonable rains at other times. Intense storms along the Kohala coast are rare. More than 90 percent of the days in the year are sunny and free of cloud cover. Low humidity levels (commonly under 40 percent) and cooling breezes maintain a consistent level of comfort throughout the year. The humidity is relatively constant year-round, showing a significantly smaller summer-winter difference than is common elsewhere.

The mean annual temperature is about 78 degrees Fahrenheit, with relatively small daily and seasonal fluctuations. Daytime highs above 90 degrees F. or nighttime lows below 63 degrees F. are extremely rare. The mauka lands, at a higher elevation than the lands makai of the Queen Ka'ahumanu Highway, should be cooler during nighttime hours.

Airflow is most commonly onshore from mid-morning until just before sunset and offshore from early evening until the following morning. This diurnal pattern contrasts with the relatively constant northeast tradewinds prevalent in most other areas of the State. The average wind velocity is also less -- 7 to 8 mph for the land-to-sea breeze compared with 12 to 14 mph for the tradewinds. However, gusty winds blowing through the saddle between the Kohala Mountains and Mauna Kea do reach the shoreline under certain atmospheric conditions.

### 1.2 **PHYSIOGRAPHIC CHANGES**

Development of the South Kohala Resort will not require major changes to the existing landforms. Minor changes in surface contours will be made to improve drainage, provide adequate building sites, set road alignments, and establish desirable golf fairway topography.

Because of the shallow soil cover, construction of the golf course and the landscaping of areas around the hotel and home sites will require imported soil material and irrigation.

### 1.3 IMPACT ON SOILS AND THEIR USE FOR AGRICULTURAL ACTIVITIES

As explained previously, none of the land at the project site has agricultural potential, so development of the resort will have no impact on the actual or potential agricultural productivity of the site. The only agricultural activity known to have existed in the project area is limited grazing, but the site is currently unused. There are other areas on the Big Island with soils more suitable for agricultural production and where the surrounding land uses are more compatible with agricultural activities. Development of the proposed resort-residential project will have no adverse impact on suitable agricultural lands or agricultural activity on the Island of Hawaii.

In fact, construction of the South Kohala Resort may actually increase agricultural production elsewhere on the island due to increased demand for local agricultural products such as fruit, nuts, vegetables, meat, and fish. The Westin Mauna Kea makes regular purchases of substantial quantities of the above local products, and it is expected that the planned South Kohala Resort hotel will do likewise.

## 2.0 TSUNAMIS AND FLOOD HAZARD

### 2.1 EXISTING CONDITIONS

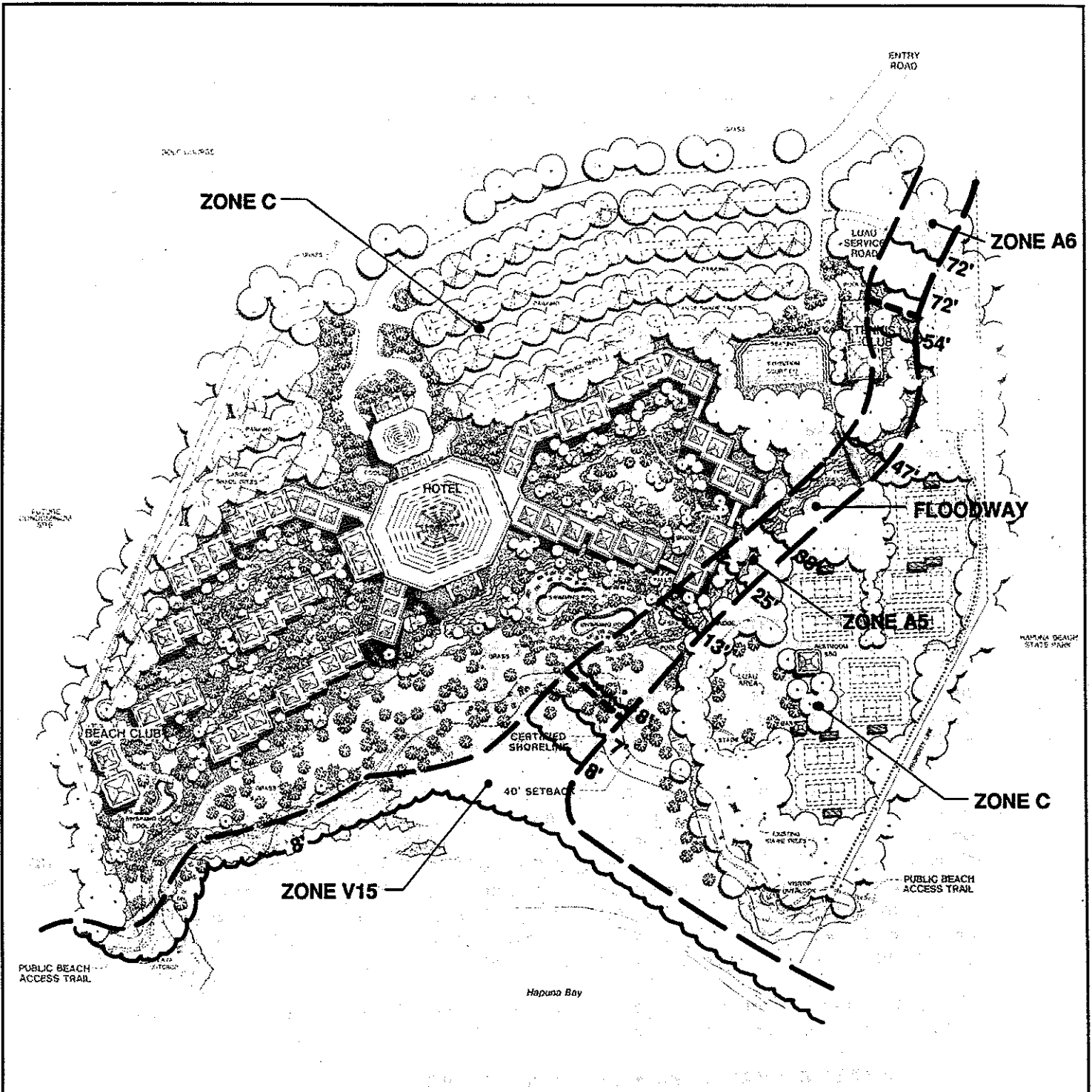
Development along the South Kohala coastline must take into account the possibility that a tsunami will strike. There are also hazards of hurricanes and high surf caused by passing storms. (See Section 4.1.4 in this chapter for a description of storm waves.) Tsunami runup information for the area is scarce due to the infrequency of tsunamis and the paucity of shoreline development in South Kohala until recent years. Of the 85 tsunamis observed in Hawaii since 1813, the one occurring in 1946 was the largest. It reached an elevation of approximately 12 feet above mean low low water (MLLW) at Kawaihae, a few miles to the north of the proposed resort site.

The South Kohala Resort shoreline lies within the special flood hazard area as indicated in the Flood Insurance Rate Map for the area (Federal Emergency Management Agency, May 3, 1982). The flood insurance rate maps, which define hazard areas, are based on the Federal Flood Insurance Administration's scientific and engineering report, The Flood Insurance Study for the County of Hawaii, dated February 1, 1982. A seaward portion of the project lies within the flood hazard boundary for the 100-year coastal flood (see Figure IV-1). The 100-year tsunami elevation at the project site is eight feet at the shoreline and declines slightly with distance inland. A 100-year flood has a one percent chance of being equaled or exceeded in any given year.

The coastal area of the property falls into designated zone V15. Areas zoned V1 to V30 (the "V" stands for velocity -- a measure of wave action) are termed "coastal high hazard" (tsunami) zones, or V zones, in the County Code. Structures built within these zones must meet specified construction standards.

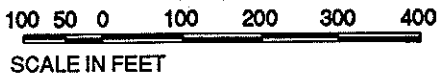
As shown in Figure IV-1, most of the South Kohala Resort property is in Zone C, defined as an area of minimal flooding.





**LEGEND:**

- 8' Base Flood Elevation Line
- ZONE A5/A6** Areas of 100-Year Flood; Base Flood Elevations and Flood Hazard Factors Determined.
- ZONE V15** Areas of 100-Year Coastal Flood Velocity (Wave Action); Base Flood Elevations are Flood Hazard Factors Determined.
- ZONE C** Areas of Minimal Flooding



NORTH

**Figure IV-1  
FLOOD INSURANCE RATE MAP**

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

## 2.2 PROBABLE IMPACTS AND MITIGATION MEASURES

Resort structures on the property will be sited taking into consideration hazardous coastal zones. Should a facility be in a hazard zone, design will comply with all applicable County requirements. In compliance with the Hawaii County Civil Defense Agency, an emergency response plan will be prepared, specifying the warning, evacuation, and securement procedures for the resort during emergencies.

## 3.0 SURFACE WATER AND DRAINAGE

### 3.1 EXISTING CONDITIONS

Drainageways on the project site are fairly well defined despite the dryness of the area. Due to low rainfall, drainageways and gulches experience only intermittent flow. During rainstorms, runoff concentrates in the gulches and can move down the 6 to 12 percent slopes at high velocity.

The project site's drainage areas and their characteristics are described in Table IV-1. There are six major land area tributaries or basins, all covered by a single soil type -- Kawaihae extremely stony, very fine sandy loam -- which is rated by the U.S. Department of Agriculture, Soil Conservation Service, as Class C soil. This rating indicates that the soil has a low infiltration rate when thoroughly wetted. The soil layer is capable of retaining little moisture, and the underlying lavas are massive and relatively impermeable. As a result, interflow between rock and soil is significant and tends to rapidly carry water into the drainageways.

At present, about half of the project site has a grass cover and half consists of bare soil or rock. The curve number (CN) used by the Soil Conservation Service for estimating surface runoff from rainfall is estimated to be between 75 and 80, on a scale of 0 to 100. Runoff CNs for Class C soil ranges from 70 to 91. Numbers are assigned on the basis of the hydrologic characteristics of the soil and the type of ground cover. The higher the CN, the more likely that there will be surface runoff. (U.S. Department of Agriculture, Soil Conservation Service, 1972, p. 10-2.)

Locations of the drainage basins, existing culverts, and general course of flow are shown in Figure IV-2.

## 3.2 PROBABLE IMPACTS AND MITIGATION MEASURES

One of the existing culverts, 36 inches in diameter and located south of the Westin Mauna Kea entry road, lies at the bottom of an 885-acre drainage basin that generates several hundred cubic feet per second of runoff. During a recent severe storm (exceeding 100-year frequency), storm runoff overtopped the Queen Ka'ahumanu Highway, causing damage to the drainageways and the beach south of the Westin Mauna Kea. Schematically, a retention basin is proposed to be located upstream of this culvert to dampen the peak flow and lessen downstream damage. Detailed studies at a later stage will be required to determine solutions to this problem.

Table IV-1

Characteristics of the Drainage Areas  
Proposed South Kohala Resort

| Basin | Tributary Area (acres) | Average Drainage Slope (ft./ft.) | Total Watershed Length (ft.) | Soil and Groundcover Rating |                           |                            | Runoff From the 100-Year, 6-Hour Storm* |                           | Change (cfs per Acre) |
|-------|------------------------|----------------------------------|------------------------------|-----------------------------|---------------------------|----------------------------|-----------------------------------------|---------------------------|-----------------------|
|       |                        |                                  |                              | Hydrologic Soil Class       | Existing Rated "CN" Value | Developed Rated "CN" Value | Existing Peak Rate (cfs)                | Developed Peak Rate (cfs) |                       |
|       |                        |                                  |                              |                             |                           |                            |                                         |                           |                       |
| A     | 580                    | 0.06                             | 18,000                       | C                           | 76                        | 79                         | 490                                     | 530                       | 0.07                  |
| B     | 885                    | 0.057                            | 23,000                       | C                           | 76                        | 79                         | 660                                     | 705                       | 0.05                  |
| C     | 16                     | 0.07                             | 1,150                        | C                           | 76                        | 81                         | 33                                      | 37                        | 0.25                  |
| D     | 35                     | 0.05                             | 2,600                        | C                           | 76                        | 79                         | 59                                      | 61                        | 0.06                  |
| E     | 46                     | 0.08                             | 2,800                        | C                           | 76                        | 76                         | 79                                      | 79                        | 0.00                  |
| F     | 4,680                  | 0.07                             | 40,000                       | C                           | 76                        | 76                         | 2,570                                   | 2,570                     | 0.00                  |

\* Based on "runoff-curve number" method presented in Erosion and Sediment Control, Guide for Hawaii, U.S. Department of Agriculture, Soil Conservation Service, March 1981.

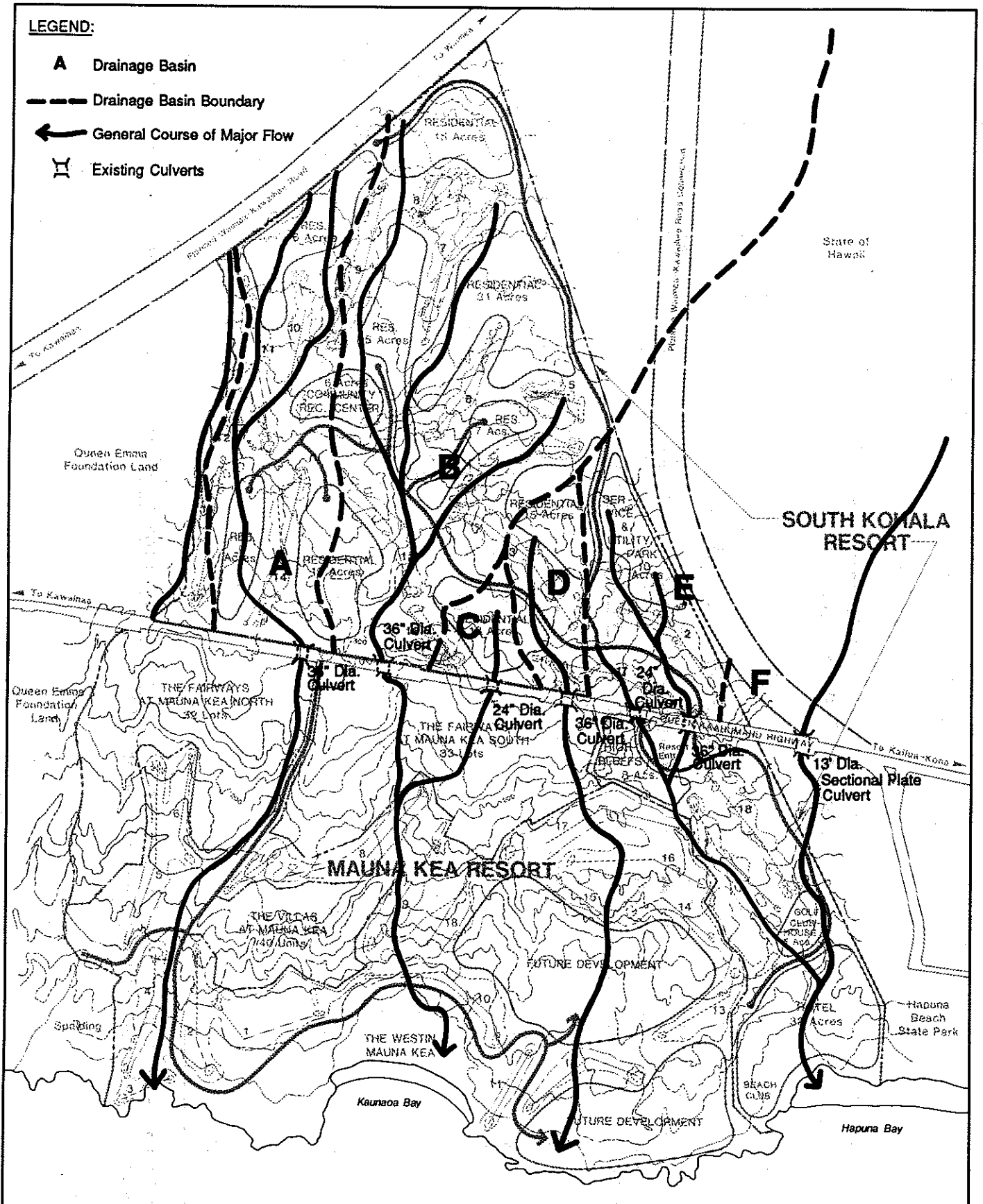
**LEGEND:**

**A** Drainage Basin

--- Drainage Basin Boundary

← General Course of Major Flow

⌘ Existing Culverts



800 400 0 800 1600

SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES

Honolulu, Hawaii

September 1987



NORTH

**Figure IV-2  
DRAINAGE**

**SOUTH KOHALA RESORT**  
Kohala Coast Resort Region • South Kohala, Hawaii

The drainage system for the proposed South Kohala Resort will be designed to avoid affecting the basic drainage patterns of the area. Swales and conduits will intercept runoff from developed areas and direct them to drainageways which run downslope to the ocean. A major drainageway runs just south of the tennis club and between the hotel complex and tennis courts. In other cases, dry wells will be employed to dispose of stormwater. Where possible, retention basins and depressions in the golf course will be used to store stormwater and sediment. The drainage system will be designed to County of Hawaii standards.

A detailed discussion of the impact of runoff on the ocean environment is contained in the next section.

#### **4.0      NEARSHORE AND MARINE ENVIRONMENT**

##### **4.1      EXISTING CONDITIONS**

This summary of nearshore and marine environmental conditions is primarily drawn from a baseline assessment of the marine environment in the vicinity of the proposed South Kohala Resort, undertaken by Steven Dollar of Marine Research Consultants in May and July of 1987. The report is included in Appendix B.

An earlier baseline survey of the same site was conducted by Dollar in February 1984, and data from that survey has been compared with the more recent data to determine seasonal variability in the marine environment adjacent to the project site.

##### **4.1.1    Coastal Morphology**

The entire development parcel, situated adjacent to Hapuna Bay, is characterized by a basaltic shoreline which terminates at the waterline in a shallow sea cliff. The sea floor near the shoreline is composed of sand channels, boulder channels, and basaltic extrusions. These extrusions create unique topographical features in the form of arches, shallow caves, and pillars -- preferred habitats for settlement of attached benthos (bottom-dwelling species), as well as shelter for fish and other motile organisms. Beyond the shoreline cliff region, the majority of the area is a flat sand plain. Interspersed throughout the area are small patch reefs composed of basaltic and limestone finger-like extrusions, which provide settling sites for living coral colonies and other attached benthic species. Flat areas of bare limestone, apparently former living coral reefs killed by excessive sediment scour during winter months, occur in many areas adjacent to the extrusions.

##### **4.1.2    Sand Deposits and Other Littoral Material**

A reasonable estimate is that 75 percent of the bottom is covered with sand, while 25 percent is solid basalt or limestone. This relatively large proportion of sandy bottom cover on nearshore areas is atypical of most of the west coast of Hawaii, which is characterized by a narrow reef zone of basaltic substratum which terminates in a sharp dropoff to abyssal depths, and coral cover in the range of 40 to 75 percent. The extensive sand cover is a result of both the topographically flat plateau off the development area, as well as movement of sand between the shoreline beaches at both the north and south ends of the property.

#### 4.1.3 Prevailing Waves

Islands to the northwest and the land mass of the Big Island itself provide substantial shielding from waves, limiting the direct wave exposure of Hapuna Bay to the sector from bearing 225 to 300 degrees. For this exposure, only relatively small segments of the spectrum of North Pacific swell and Kona storm waves can reach the bay without significant loss of height and energy.

Data on the actual waves off Hapuna are not available, but hindcasting and wave measurements done for the OTEC coldwater pipe testing program off Keahole Point provide data which are reasonably indicative of prevailing conditions. Wave heights less than two feet occurred 47 percent of the time, wave heights less than four feet occurred 94 percent of the time, and higher waves occurred 6 percent of the time. Wave periods were generally less than 12 seconds. (Edward K. Noda and Associates, 1986.) Conditions at Hapuna are expected to be even calmer than Keahole Point, which has a wider exposure to both the north and south.

#### 4.1.4 Storm Waves

Storm waves approach Hapuna Bay on occasion in winter and very infrequently in other seasons. The heights and frequencies of occurrence as listed in previous studies of the Kona coast are summarized below. North Pacific swells from west-northwest are considerably more significant than Kona storm waves. Their expected heights for a given recurrence interval are greater, and localized effects of refraction provide less protection than for Kona storm waves.

Summary of Storm Wave Heights and Frequencies of Occurrence  
West Hawaii

| Return<br>Period<br>(Years) | Evans-Hamilton, Inc.<br>(Undated) |                      | Sea Engineering<br>(1984) |                      | Rocheleau<br>(1977)              |
|-----------------------------|-----------------------------------|----------------------|---------------------------|----------------------|----------------------------------|
|                             | WNW Swells<br>(Feet)              | Kona Storm<br>(Feet) | WNW Swells<br>(Feet)      | Kona Storm<br>(Feet) | All Deepwater<br>Waves<br>(Feet) |
| 2                           | 17.0                              | 10.2                 | 10 to 15                  |                      | 15.7                             |
| 10                          | 19.7                              | 13.1                 | 20 to 25                  |                      | 25.2                             |
| 25                          | 21.6                              | 14.8                 | 25 to 30                  | 17.0                 | 29.8                             |
| 50                          | 22.6                              | 16.2                 | 30+                       |                      | 33.0                             |
| 100                         | 23.8                              | 17.5                 | ---                       |                      | 36.5                             |

The high surf caused by winter storms pose a serious hazard at Hapuna. As high surf strike the beach, dangerous shorebreak waves and extremely fast-flowing, shifting rip currents are generated.

#### 4.1.5 Ocean Water Quality

State water quality standards for ocean water are specified in Chapter 54 of Title 11, Administrative Rules of the Department of Health. The open coastal waters adjacent to the proposed project site are designated Class AA. Waters so classified are intended to remain in their natural state as nearly as possible and subjected to a minimum of pollution or other form of water quality alteration as a result of human actions (State of Hawaii, Department of Health, November 12, 1982).

Planning for the proposed resort has focused on maintaining a high level of environmental quality by addressing the potential for undesirable habitat changes that could result from shoreline development. Specific objectives of the marine surveys were to (a) establish a quantitative baseline to accurately depict water quality characteristics that could potentially affect biota, and (b) provide baseline descriptions of community structure of the indigenous marine populations inhabiting the subject area.

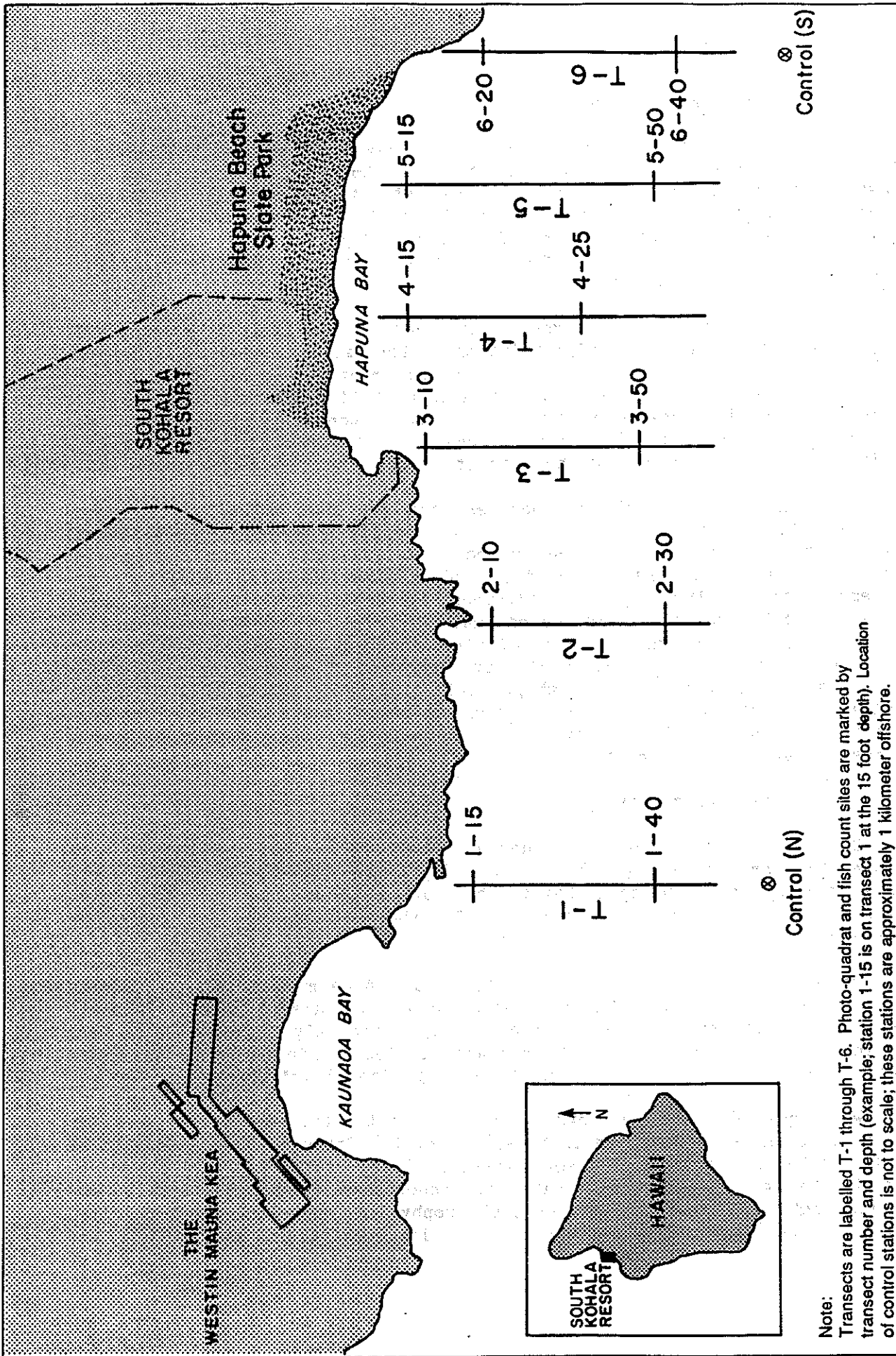
From the surveys, Dollar concludes that the area around the proposed South Kohala Resort is one of the most physically stressed and sub-optimal (with respect to reef associated marine biota) regions on the entire west coast of Hawaii. During a period of moderate swell, water conditions are extremely turbid. These turbid conditions, in combination with the dominance of sandy substratum, result in sub-optimal environmental conditions from both an aesthetic and biophysical point of view. During the summer months, when swell activity is minimal, water clarity improves and is equal to neighboring areas that do not possess the high proportion of sandy substratum. Although biological communities are not as rich as other areas with more complex substratum, the shoreline region, when accessible, does afford enjoyable snorkeling and diving conditions.

##### 4.1.5.1 Water Chemistry

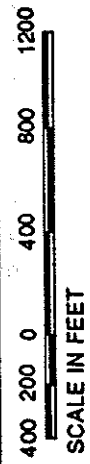
During a baseline survey conducted on May 27-28, 1987, water chemistry sample stations were spaced 10, 50, and 150 meters from the shoreline along three transects between Hapuna Bay to the south and Kauna'oa Bay to the north. These are the same transects selected for the earlier baseline survey in February 1984.

On July 21, 1987, samples were taken at three more transects located within Hapuna Bay itself. Figure IV-3 shows these transect sites. In addition, two ocean control stations located approximately 1 km offshore were sampled to compare water chemistry characteristics within the study area with that of the oceanic environment unaffected by coastal influence.

Water quality parameters evaluated included the thirteen criteria designated for open coastal waters in S11-54-06 of the State of Hawaii Department of Health Water Quality Standards. These include: total Kjeldahl nitrogen, ammonia nitrogen, nitrate + nitrite, orthophosphate phosphorus, total phosphorus, light extinction coefficient, chlorophyll a, nephelometric turbidity, and nonfilterable residue (NFR), salinity, dissolved oxygen, temperature, and pH.



Note:  
 Transects are labelled T-1 through T-6. Photo-quadrat and fish count sites are marked by transect number and depth (example; station 1-15 is on transect 1 at the 15 foot depth). Location of control stations is not to scale; these stations are approximately 1 kilometer offshore.



Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii September 1987

Figure IV-3  
 MARINE SURVEY TRANSECT SITES

SOUTH KOHALA RESORT  
 Kohala Coastal Resort Region • South Kohala, Hawaii

Control (S)

Control (N)



Table IV-2 shows the various limits specified for the 13 water quality parameters in the Department of Health Water Quality Standards. Table IV-3 indicates the values of these parameters measured at the ten locations off the proposed South Kohala Resort. Most of the water chemistry measurements fall within the specified limits set by DOH standards, and there is relatively little difference between most of the measurements taken on the transects compared to the ocean controls. The single exception is nitrate + nitrite (NO<sub>3</sub>- + NO<sub>2</sub>-), which is substantially higher at the nearshore stations. NO<sub>3</sub>- + NO<sub>2</sub>- is the most abundant type of nitrogen in groundwater, while normally the least abundant in open ocean waters. The high levels are a result of groundwater extrusion at the shoreline. Calm sea conditions allow the formation of a surface lens of lower salinity groundwater that extends some distance offshore. Salinity decreases moving offshore and is lower on the transects than at the ocean control station, while an inverse pattern occurs for NO<sub>3</sub>- + NO<sub>2</sub>-.

All nutrient parameters at Station 4, located 10 meters offshore at about the midway point of Hapuna Bay, were anomalously high and may reflect some beach-related input. Because the high concentrations do not extend to any of the other sampling sites, it appears that whatever is responsible for the condition is very localized.

Table IV-4 compares the chemical parameters measured during both the 1984 and 1987 surveys. The only parameter that is substantially different between the 1984 survey and the two 1987 surveys is NO<sub>3</sub>- + NO<sub>2</sub>-. During the winter survey (1984), high wave action stirred the surface waters to an extent that the surface lens of groundwater was obliterated. It is worth noting that with this one exception, water chemical parameters are very similar between the extremes of seasonal conditions.

In addition to the surveys described above, sampling and testing of shoreline waters were also conducted for the purpose of determining the potential for contamination of shoreline or groundwaters by agricultural chemicals. See section 4.2.2.1 in this chapter for a detailed discussion of this study.

#### 4.1.6 Groundwater

Groundwater along the South Kohala coast occurs as a basal lens in hydraulic continuity with the ocean. Calculations of the total groundwater flow have established a probable range of from 3.0 to 7.0 mgd per coastal mile (Bowles, 1974; Nance, 1981; and Kanehiro and Peterson, 1977). At distances of four or more miles inland of the shoreline, groundwater is of potable quality and wells have been developed to supply the domestic water requirements of the coastal region. Closer to the shoreline, groundwater is brackish, but a number of wells have been successfully developed for golf course irrigation. Shoreline discharge of groundwater tends to concentrate at cracks and other small-scale, localized fissures. For example, groundwater seepage is known to take place at the north end of Hapuna Bay (see Figure IV-4). The discharge is noticeable by temperature difference and visually by the refraction effects. When the coastal waters are extremely calm, a surface layer of brackish groundwater is formed.

Table IV-2

Specific criteria specified by DOH water quality standards for open coastal waters

| Parameter                                                              | Geometric mean not to exceed the given value | Not to exceed the given value more than 10% of the time | Not to exceed the given value |
|------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------|-------------------------------|
| Total Kjeldahl Nitrogen (ug N/l)                                       | 150.00*<br>110.00**                          | 250.00*<br>180.00**                                     | 350.00*<br>250.00**           |
| Ammonia Nitrogen (ug NH <sub>4</sub> -N/l)                             | 3.50*<br>2.50**                              | 8.50*<br>5.00**                                         | 15.00*<br>9.00**              |
| Nitrate +Nitrite Nitrogen (ug [NO <sub>3</sub> +NO <sub>2</sub> ]-N/l) | 5.00*<br>3.50**                              | 14.00*<br>10.00**                                       | 25.00*<br>20.00**             |
| Orthophosphate Phosphorus (ug PO <sub>4</sub> -P/l)                    | 7.00*<br>5.00**                              | 12.00*<br>9.00**                                        | 17.00*<br>13.00**             |
| Total Phosphorus (ug P/l)                                              | 20.00*<br>16.00**                            | 40.00*<br>30.00**                                       | 60.00*<br>45.00**             |
| Light Extinction Coefficient (k units)                                 | 0.20*<br>0.10**                              | 0.50*<br>0.30**                                         | 0.85*<br>0.55**               |
| Chlorophyll a (ug/l)                                                   | 0.30*<br>0.15**                              | 0.90*<br>0.50**                                         | 1.75*<br>1.00**               |
| Turbidity (Nephelometric Turbidity Units)                              | 0.50*<br>0.20**                              | 1.25*<br>0.50**                                         | 2.00*<br>1.00**               |
| Nonfilterable Residue (ng/l)                                           | 20.0*<br>10.0**                              | 30.0*<br>15.0**                                         | 40.0*<br>20.0**               |

\*"Wet" criteria apply when the open coastal waters receive more than three million gallons per day of fresh water discharge per shoreline mile.

\*\*"Dry" criteria apply when the open coastal waters receive less than three million gallons per day of fresh water discharge per shoreline mile.

Applicable to both wet and dry conditions:

pH units shall not deviate more than 0.5 units from a value of 8.1.

Dissolved oxygen - Not less than 75% saturation.

Temperature - Shall not vary more than 1 deg. C from ambient conditions.

Salinity - Shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

Table IV-3

Water chemistry parameters measured at stations offshore of proposed South Kohala Resort.  
For Station locations, see Figure 1.

| STATION       | DISTANCE FROM SHORE (M) | TOTAL KJELDRAHL NITROGEN (ug N/L) | AMMONIA NITROGEN (ug N/L) | NITRATE + NITRITE NITROGEN (ug N/L) | ORTHO-PHOSPHORUS (ug P/L) | TOTAL PHOSPHORUS (ug P/L) | LIGHT EXTINCTION COEFFICIENT (k units) | CHLOROPHYLL a (ug/L) | TURBIDITY (Nephelometric turbidity units) |
|---------------|-------------------------|-----------------------------------|---------------------------|-------------------------------------|---------------------------|---------------------------|----------------------------------------|----------------------|-------------------------------------------|
| 1             | 10                      | 5.93                              | 0.12                      | 1.43                                | 0.14                      | 0.52                      | 0.13                                   | 1.00                 | 0.39                                      |
|               | 50                      | 14.82                             | 0.08                      | 1.30                                | 0.12                      | 0.50                      | 0.11                                   | 0.71                 | 0.24                                      |
|               | 150                     | 6.27                              | 0.10                      | 0.65                                | 0.11                      | 0.57                      | 0.12                                   | 0.68                 | 0.23                                      |
| 2             | 10                      | 6.44                              | 0.17                      | 2.59                                | 0.19                      | 0.67                      | 0.06                                   | 0.28                 | 0.36                                      |
|               | 50                      | 6.97                              | 0.31                      | 2.88                                | 0.19                      | 0.53                      | 0.08                                   | 0.94                 | 0.20                                      |
|               | 150                     | 5.75                              | 0.01                      | 0.94                                | 0.10                      | 0.49                      | 0.09                                   | 2.30                 | 0.20                                      |
| 3             | 10                      | 6.53                              | 0.17                      | 9.23                                | 0.32                      | 0.64                      | 0.10                                   | 0.32                 | 0.25                                      |
|               | 50                      | 5.25                              | 0.08                      | 6.78                                | 0.24                      | 0.57                      | 0.10                                   | 0.49                 | 0.22                                      |
|               | 150                     | 5.69                              | 0.03                      | 3.94                                | 0.19                      | 0.57                      | 0.06                                   | 0.98                 | 0.29                                      |
| 4             | 10                      | 20.68                             | 1.44                      | 1.98                                | 2.05                      | 2.49                      | 0.10                                   | 1.01                 | 0.75                                      |
|               | 50                      | 6.56                              | 0.32                      | 0.26                                | 0.15                      | 0.48                      | 0.09                                   | 0.97                 | 0.40                                      |
|               | 150                     | 5.77                              | 0.30                      | 0.05                                | 0.16                      | 0.57                      | 0.08                                   | 0.65                 | 0.27                                      |
| 5             | 10                      | 5.25                              | 0.35                      | 1.91                                | 0.20                      | 0.48                      | 0.11                                   | 2.97                 | 0.42                                      |
|               | 50                      | 9.52                              | 1.74                      | 0.21                                | 0.37                      | 0.75                      | 0.10                                   | 1.63                 | 0.32                                      |
|               | 150                     | 5.77                              | 0.30                      | 0.08                                | 0.16                      | 0.52                      | 0.10                                   | 0.24                 | 0.18                                      |
| 6             | 10                      | 5.75                              | 0.46                      | 2.14                                | 0.22                      | 0.53                      | 0.11                                   | 0.74                 | 0.54                                      |
|               | 50                      | 5.77                              | 0.42                      | 0.32                                | 0.15                      | 0.51                      | 0.09                                   | 1.74                 | 0.26                                      |
|               | 150                     | 5.67                              | 0.30                      | 0.11                                | 0.15                      | 0.52                      | 0.09                                   | 0.59                 | 0.25                                      |
| OCEAN CTL (N) | 1500                    | 6.44                              | 0.05                      | 0.10                                | 0.10                      | 0.52                      | 0.08                                   | 0.45                 | 0.23                                      |
| OCEAN CTL (S) | 1500                    | 5.79                              | 0.30                      | 0.05                                | 0.20                      | 0.51                      | 0.08                                   | 1.11                 | 0.31                                      |

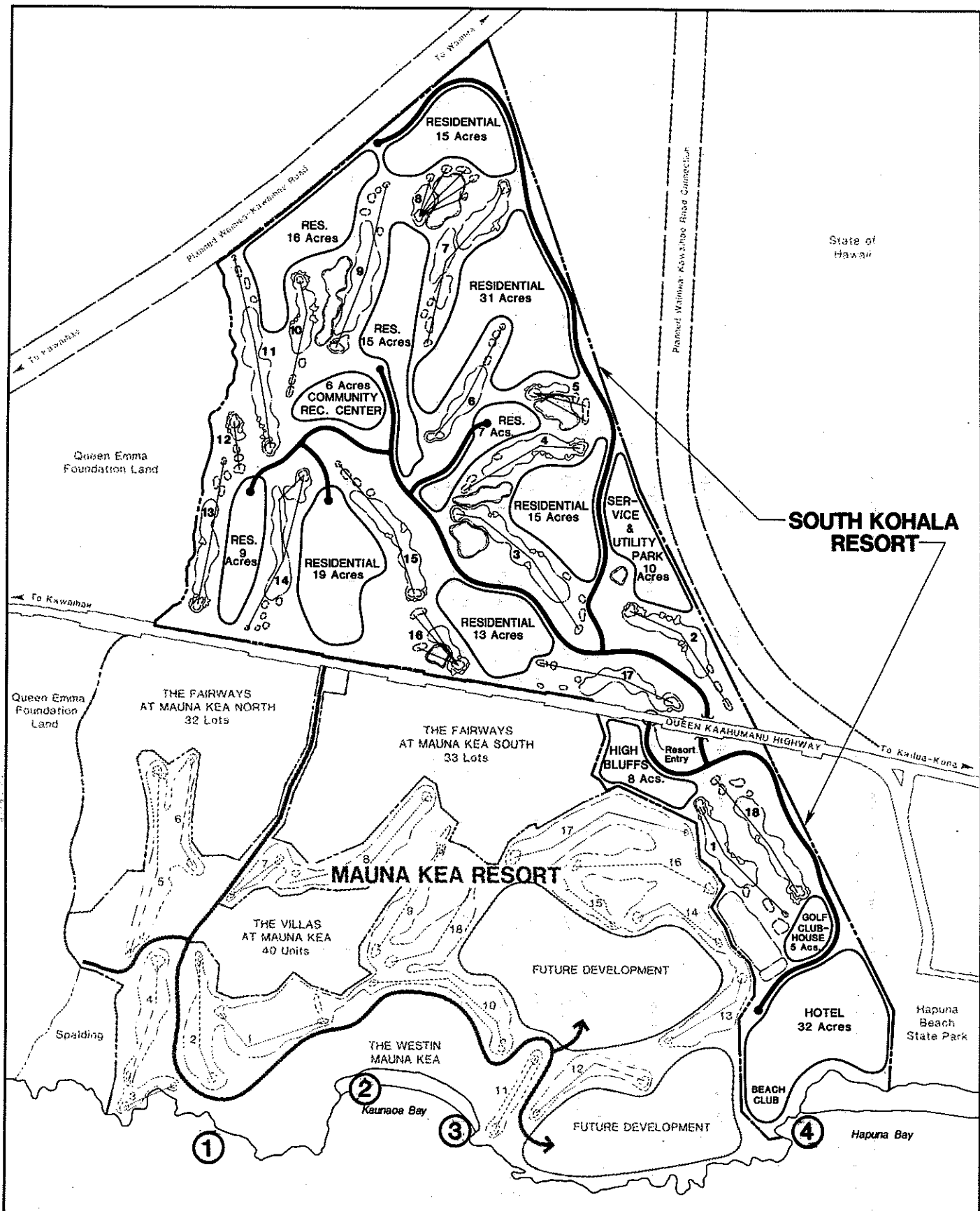
Table IV-3 (continued)

| TRANSECT      | DISTANCE FROM SHORE (m) | NON-FILTERABLE RESIDUE (mg/L) | DISSOLVED OXYGEN (% sat.) | DISSOLVED OXYGEN (mg/l) | SALINITY (ppt) | pH    | TEMPERATURE (deg. C) |
|---------------|-------------------------|-------------------------------|---------------------------|-------------------------|----------------|-------|----------------------|
| 1             | 10                      | 2.2                           | 102.8                     | 6.84                    | 33.915         | 8.112 | 26.0                 |
|               | 50                      | 1.6                           | 95.1                      | 6.33                    | 34.207         | 8.098 | 25.6                 |
|               | 150                     | 9.5                           | 92.6                      | 6.21                    | 34.536         | 8.099 | 25.7                 |
| 2             | 10                      | 1.2                           | 95.5                      | 6.37                    | 33.660         | 8.113 | 25.7                 |
|               | 50                      | 2.3                           | 94.0                      | 6.26                    | 33.746         | 8.113 | 25.7                 |
|               | 150                     | 1.8                           | 94.5                      | 6.32                    | 34.329         | 8.098 | 25.6                 |
| 3             | 10                      | 2.7                           | 95.4                      | 6.38                    | 31.121         | 8.114 | 25.6                 |
|               | 50                      | 13.3                          | 94.5                      | 6.32                    | 32.334         | 8.113 | 25.8                 |
|               | 150                     | 3.1                           | 94.5                      | 6.31                    | 33.178         | 8.113 | 25.8                 |
| 4             | 10                      | 5.9                           | 95.6                      | 6.4                     | 33.717         | 8.113 | 26.0                 |
|               | 50                      | 5.9                           | 95.1                      | 6.33                    | 34.390         | 8.114 | 25.8                 |
|               | 150                     | 3.9                           | 95.0                      | 6.30                    | 34.536         | 8.113 | 25.6                 |
| 5             | 10                      | 6.7                           | 101.1                     | 6.78                    | 33.589         | 8.112 | 25.7                 |
|               | 50                      | 7.8                           | 95.6                      | 6.38                    | 34.438         | 8.114 | 25.7                 |
|               | 150                     | 4.2                           | 94.7                      | 6.35                    | 34.506         | 8.115 | 25.4                 |
| 6             | 10                      | 3.5                           | 99.0                      | 6.71                    | 33.648         | 8.110 | 25.7                 |
|               | 50                      | 1.8                           | 95.5                      | 6.37                    | 34.223         | 8.112 | 25.6                 |
|               | 150                     | 4.4                           | 95.6                      | 6.38                    | 34.503         | 8.122 | 25.6                 |
| OCEAN CTL (N) | 1500                    | 2.1                           | 93.9                      | 6.36                    | 34.746         | 8.098 | 25.9                 |
| OCEAN CTL (S) | 1500                    | 2.2                           | 94.1                      | 6.38                    | 34.574         | 8.116 | 25.8                 |

Table IV-4

Comparison of water quality parameters measured in March, 1984, and June 1987 offshore of proposed South Kohala Resort. For Station locations see Figure 1.

| STATION       | DISTANCE FROM SHORE (m) | AMMONIA NITROGEN (µM) |      | NITRATE + NITRITE NITROGEN (µM) |      | ORTHO-PHOSPHATE (µM) |      | CHLOROPHYLL a (µg/L) |      | NON-FILTERABLE RESIDUE (mg/L) |      | DISSOLVED OXYGEN (mg/L) |      | SALINITY (ppt) |       |
|---------------|-------------------------|-----------------------|------|---------------------------------|------|----------------------|------|----------------------|------|-------------------------------|------|-------------------------|------|----------------|-------|
|               |                         | 1987                  | 1984 | 1987                            | 1984 | 1987                 | 1984 | 1987                 | 1984 | 1987                          | 1984 | 1987                    | 1984 | 1987           | 1984  |
| 1             | 10                      | 0.12                  | 0.09 | 1.43                            | 0.21 | 0.14                 | 0.13 | 1.00                 | 0.52 | 2.20                          | 2.77 | 6.84                    | 6.90 | 33.91          | 32.00 |
|               | 50                      | 0.08                  | 0.10 | 1.30                            | 0.49 | 0.12                 | 0.18 | 0.71                 | 0.40 | 1.60                          | 0.31 | 6.33                    | 6.70 | 34.21          | 32.80 |
|               | 150                     | 0.10                  | 0.05 | 0.65                            | 0.18 | 0.11                 | 0.15 | 0.68                 | 0.32 | 9.50                          | 0.00 | 6.21                    | 6.80 | 34.54          | 32.00 |
| 2             | 10                      | 0.17                  | 0.18 | 2.59                            | 0.17 | 0.19                 | 0.13 | 0.28                 | 0.45 | 4.20                          | 2.27 | 6.37                    | 6.80 | 33.66          | 32.50 |
|               | 50                      | 0.31                  | 0.21 | 2.88                            | 0.45 | 0.19                 | 0.18 | 0.94                 | 0.33 | 2.30                          | 0.55 | 6.26                    | 6.90 | 33.75          | 32.10 |
|               | 150                     | 0.01                  | 0.10 | 0.94                            | 0.36 | 0.10                 | 0.15 | 2.30                 | 0.47 | 1.80                          | 0.41 | 6.32                    | 6.50 | 34.33          | 32.00 |
| 3             | 10                      | 0.17                  | 0.29 | 9.23                            | 0.43 | 0.32                 | 0.16 | 0.32                 | 0.38 | 2.70                          | 0.90 | 6.38                    | 6.50 | 31.12          | 32.10 |
|               | 50                      | 0.08                  | 0.32 | 6.78                            | 0.36 | 0.24                 | 0.17 | 0.49                 | 0.32 | 13.30                         | 0.34 | 6.32                    | 6.80 | 32.33          | 32.00 |
|               | 150                     | 0.03                  | 0.13 | 3.94                            | 0.02 | 0.19                 | 0.09 | 0.98                 | 0.41 | 3.10                          | 0.71 | 6.31                    | 6.50 | 33.18          | 32.00 |
| OCEAN CONTROL | 1500                    | 0.05                  | 0.03 | 0.10                            | 0.01 | 0.10                 | 0.05 | 0.45                 | 0.34 | 2.40                          | 0.00 | 6.36                    | 6.70 | 34.75          | 32.00 |



800 400 0 800 1600

SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES

Honolulu, Hawaii

September 1987



NORTH

**Figure IV-4**  
**SAMPLE COLLECTION SITES**

**SOUTH KOHALA RESORT**  
Kohala Coast Resort Region • South Kohala, Hawaii

#### 4.1.7 Marine Biological Community

Marine community structure can be defined as the abundance, diversity, and distribution of stony and soft coral; other attached benthic fauna and flora such as algae and sponges; motile benthos such as echinoderms, mollusks, and crustacea; and species such as reef fish and sea turtles.

The most useful biological communities for direct evaluation of environmental impacts are benthic (bottom dwelling) communities. Because benthos are generally long-lived, immobile, and intimately affected by exogenous input of sediments and other potential pollutants, these organisms must either tolerate the surrounding conditions within the limits of adaptability or die. Stony corals are of particular importance in nearshore Hawaiian environments. They contribute a large portion of the reef biomass and their skeletal structures are vital in providing a complex of habitat space, shelter, and food for other species. Therefore, coral community structure is considered the most relevant as a means of evaluating past and potential impacts associated with land development, especially since alterations in coral communities are easy to identify.

Along each transect (see Figure IV-3), two quantitative survey sites containing relatively large components of coral reef were selected. The methodology followed is explained in detail in Appendix B, but in general, the percent cover of various species of coral was determined and other organisms were counted and identified through the analysis of photos taken at the sites and in situ estimates made by a diver.

**Coral.** Table IV-5 shows percent cover of each coral species, total coral cover, and coral species diversity on each of the 12 photo-transect surveys. Twelve coral species were encountered, and coral cover ranged from 3 to 58 percent. However, since transect locations were selected to traverse regions of maximal coral cover, the estimates cannot be extrapolated to represent coral cover for the entire region. As described previously, the regions of hard substrata where corals are found comprise about 25 percent of the bottom, while about 75 percent of the bottom is shifting sand.

Three zones, each characterized by a dominant coral species can be identified. The zone nearest to shore is dominated by the hemispherical branching species Pocillopora meandrina and P. eydouxi. The second and most abundant zone is dominated by the encrusting species Porites lobata, which comprises the majority of most reefs in Hawaii. The deepest zone is dominated by the "finger coral", Porites compressa.

**Other Benthic Invertebrates and Algae.** Besides coral, the dominant benthic organisms in the nearshore surge zone were encrusting coralline algae (primarily of the genera Porolithon and Peyssonellia) and sea urchins (Echinometra matheai and Echinostrephus aciculatus). In some areas densities of the urchins is on the order of 50 individuals per square meter.

Less abundant, but ubiquitous across the entire reef, were the larger species of urchins (Tripneustes gratilla, Echinothrix diadema, and Heterocentrotus mammillatus). Most common of the sea cucumbers are the species Holothuria atra and H. mauritiana. The design of the reef survey was such that only readily visible individuals were included in the census, so no

Table IV-5

Figure 1. Percent cover of each coral species and non-coral substrata on transects in the vicinity of South Kohala Resort. See Figure 1 for transect locations.

| CORAL SPECIES                                | TRANSECT DEPTH |         |         |         |         |         |       |       |       |       |       |       |     |
|----------------------------------------------|----------------|---------|---------|---------|---------|---------|-------|-------|-------|-------|-------|-------|-----|
|                                              | 1<br>15        | 2<br>40 | 3<br>10 | 4<br>30 | 5<br>20 | 6<br>40 |       |       |       |       |       |       |     |
| <u>Porites lobata</u>                        | 21.0           | 13.4    | 27.8    | 7.5     | 13.5    | 14.0    | 10.4  | 2.1   | 9.7   | 37.7  | 29.2  |       |     |
| <u>Porites compressa</u>                     | 1.0            | 41.0    | 0.7     | 0.8     | 1.2     | 2.0     | 0.4   | 14.2  | 18.1  | 0.3   | 32.2  |       |     |
| <u>Porites brighami</u>                      |                |         |         |         |         |         |       |       |       |       | 2.3   |       |     |
| <u>Porites (Synarea) convexa</u>             |                |         |         |         |         |         |       |       |       |       | 0.2   |       |     |
| <u>Pocillopora meandrina</u>                 | 3.9            | 0.2     | 0.5     | 2.2     | 0.1     | 0.1     | 0.1   | 0.1   | 0.2   | 0.1   | 4.4   | 0.4   |     |
| <u>Pocillopora eydouxi</u>                   |                |         | 2.1     |         | 2.1     |         |       |       |       |       |       | 0.5   |     |
| <u>Montipora verrucosa</u>                   | 5.8            | 0.5     | 5.3     | 1.5     | 2.0     | 0.6     | 2.2   | 0.4   | 0.1   | 0.9   | 3.3   | 2.6   |     |
| <u>Montipora patula</u>                      | 0.6            |         | 1.5     |         | 0.1     |         |       |       | 0.1   | 0.3   | 3.7   | 0.2   |     |
| <u>Pavona varians</u>                        |                |         | 0.4     |         | 0.1     |         |       |       |       |       |       | 0.5   |     |
| <u>Pavona (Pseudocolunnastrea) pollicata</u> |                |         |         |         | 0.2     |         |       |       |       |       |       |       |     |
| <u>Leptastrea purpurea</u>                   | 0.1            |         |         |         |         |         |       |       |       |       |       | 0.2   |     |
| <u>Paluþoa tuberculosa</u>                   |                |         |         |         | 0.4     |         |       |       |       |       |       | 1.7   | 0.1 |
| NON-CORAL BOTTOM COVER                       |                |         |         |         |         |         |       |       |       |       |       |       |     |
| Limestone                                    | 47.6           | 1.9     | 56.1    | 11.6    | 14.0    | 34.0    | 61.2  |       | 0.5   | 1.6   | 24.4  | 26.3  |     |
| Sand                                         | 20.0           | 40.0    | 5.6     | 78.6    | 70.0    | 49.8    | 22.1  | 74.9  | 97.0  | 69.3  | 6.0   | 8.3   |     |
| Basalt                                       |                |         |         |         |         |         |       |       |       |       |       | 18.0  |     |
| NUMBER OF CORAL SPECIES                      | 6              | 5       | 7       | 3       | 10      | 5       | 1     | 1     | 1     | 5     | 7     | 8     |     |
| PERCENT CORAL COVER                          | 32.4           | 58.1    | 38.3    | 9.8     | 16.0    | 18.5    | 16.7  | 25.1  | 2.5   | 29.1  | 51.6  | 65.4  |     |
| CORAL SPECIES DIVERSITY                      | 1.043          | 0.609   | 0.970   | 0.697   | 1.614   | 0.869   | 0.180 | 0.775 | 0.606 | 0.836 | 0.991 | 0.950 |     |



attempt was made to enumerate cryptic organisms or species sheltered within the coral. No dominant communities of mollusks or crustacea, the majority of which live within interstitial spaces of the reef, were observed during the surveys at any of the study stations.

None of the assemblages of these organisms constitute any unusual or rare community. Moreover, none of the algal communities associated with early successional states of recolonization following denudation of substrate by wave action were observed.

**Reef Fish.** In general, fish encountered during the reef transecting were neither abundant nor diverse compared to other areas of West Hawaii (see Table IV-6). The greatest number of species on a transect was 21, while maximum number of individuals was 97. By comparison, transects off the Mauna Lani Resort, approximately 5 km south of the proposed South Kohala Resort, averaged about 40 species and 300 to 500 individuals.

The most abundant species were the fan tailed filefish, Pervagor spilosoma; the saddleback wrasse, Thalassoma duperreyi; and the surgeonfishes, Acanthurus nigrofuscus and Ctenochaetus strigosus. The sparse fauna is largely a consequence of the scarcity of good habitat in the area. Sites with rich coral growth were inhabited by well developed fish communities, but such areas were rare overall.

Fish were most abundant in the shallow areas by the shoreline cliff, which are characterized by numerous rocky ledges, spurs, and caves. Several large parrotfish and surgeonfish were seen in this habitat, as well as a large school of small omilu and a single manta ray. Fair numbers of aholehole, aweoweo, and menpachi inhabited the caves.

The area does not appear to offer major opportunities for spear or shoreline fishing, due to the relative scarcity of adequate sized "food fish."

**Threatened or Endangered Species.** Three species of marine mammals that occur in Hawaiian waters have been declared threatened or endangered: green sea turtle (Chelonia mydas), hawksbill turtle (Eretmochelys imbricata), and humpback whale (Megaptera novaeangliae). It is not common for whales to occupy very shallow nearshore areas such as those around Hapuna Bay. The green sea turtle occurs commonly along the coast, while the hawksbill turtle is seen infrequently. No turtles were observed during the surveys, although they undoubtedly occur in the area. The cliffed and rocky area fronting the proposed project is unsuitable as a turtle nesting site, as are the heavily used sandy beaches.

## 4.2 PROBABLE IMPACTS AND MITIGATION MEASURES

### 4.2.1 Temporary Effects of Construction

#### 4.2.1.1 Sedimentation

One potential impact resulting from nearshore development is increased sediment loading during the construction period, as a result of either wind or runoff. While corals and other reef organisms are capable of removing sediment suspended by natural phenomena, there are threshold levels of deposition where cleaning mechanisms are overwhelmed and organisms become buried.

Table IV-6

Reef fish community abundance on transect surveys of South Kohala Resort  
Resort offshore area. See Figure 1 for location of survey sites.

| TRANSECT NUMBER              | 1   | 1   | 2   | 2   | 3   | 3   | 4   | 4   | 5   | 5   | 6   | 6   |
|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| TRANSECT DEPTH               | 15' | 40' | 10' | 30' | 10' | 30' | 25' | 40' | 20' | 50' | 20' | 40' |
| FISH SPECIES                 |     |     |     |     |     |     |     |     |     |     |     |     |
| CIRRHITIDAE                  |     |     |     |     |     |     |     |     |     |     |     |     |
| Paracirrhites arcatus        | 1   |     | 2   |     | 2   | 1   | 1   | 1   |     |     | 4   | 3   |
| P. fosteri                   | 1   |     |     |     |     |     |     |     |     |     | 1   |     |
| MULLIDAE                     |     |     |     |     |     |     |     |     |     |     |     |     |
| Mulloidichthys flavolineatus |     |     | 1   |     |     |     | 3   |     |     |     |     |     |
| M. vanicolensis              |     |     |     |     | 1   |     |     |     |     |     |     |     |
| Parupaneus pleurostigma      |     | 1   |     |     |     |     |     |     |     |     |     |     |
| P. multifasciatus            | 8   |     | 4   | 2   | 2   | 3   |     |     |     | 2   |     |     |
| P. cyclostomus               |     | 1   |     |     |     | 1   | 1   | 1   |     |     |     |     |
| CHAETODONTIDAE               |     |     |     |     |     |     |     |     |     |     |     |     |
| Chaetodon lunula             |     |     |     |     |     | 1   |     |     |     |     |     |     |
| C. quadrimaculatus           |     |     |     |     | 1   |     |     |     |     | 1   |     |     |
| C. milliaris                 |     |     |     |     |     | 2   |     | 1   |     | 1   | 1   |     |
| C. ornatissimus              | 2   |     | 2   | 1   |     |     |     |     |     |     | 2   | 4   |
| C. unimaculatus              |     |     | 1   |     |     |     |     |     |     |     | 1   |     |
| C. multicinctus              | 2   | 4   | 4   |     |     | 2   | 2   | 2   |     | 1   | 2   | 6   |
| Forcipiger flavissimus       |     | 2   |     | 1   |     |     |     |     |     | 1   | 1   | 2   |
| POMACANTHIDAE                |     |     |     |     |     |     |     |     |     |     |     |     |
| Centropyge potteri           |     | 3   |     |     |     |     |     |     |     |     |     |     |
| POMACENTRIDAE                |     |     |     |     |     |     |     |     |     |     |     |     |
| Abedefduf abdominalis        |     |     |     |     |     |     |     |     |     |     |     | 1   |
| Stegastes fasciolatus        | 2   |     | 4   |     | 8   | 2   | 2   | 1   |     |     | 2   |     |
| Dascyllus albisella          |     |     |     | 2   |     | 1   | 3   | 1   |     | 6   | 4   | 4   |
| Chromis agilis               |     | 8   |     |     |     |     |     |     |     |     | 2   | 9   |
| C. hanui                     |     | 15  |     |     |     |     |     |     |     |     |     |     |
| C. vanderbilti               | 5   |     |     |     |     | 5   |     |     |     |     | 5   | 5   |
| LABRIDAE                     |     |     |     |     |     |     |     |     |     |     |     |     |
| Cheilinus unifasciatus       |     | 2   |     | 1   |     | 1   |     |     |     |     |     |     |
| Pseudocheilinus octotaenia   |     |     |     | 1   |     |     |     |     |     |     |     |     |
| Coris gaimard                |     |     | 1   |     |     |     |     |     |     |     |     |     |
| Thalassoma duperreyi         | 18  | 6   | 12  | 6   | 11  | 9   | 3   | 2   | 2   | 2   | 5   | 6   |
| Gomphosus varius             |     |     | 1   | 1   |     |     |     |     |     |     |     |     |
| Stethojulis balteata         |     |     |     | 2   | 1   |     |     |     |     |     |     |     |
| Halichoeres ornatissimus     |     |     | 2   |     | 1   |     |     |     |     |     | 1   |     |
| SCARIDAE                     |     |     |     |     |     |     |     |     |     |     |     |     |
| Scarus sordidus              |     |     |     |     |     | 1   |     |     |     |     |     |     |
| S. perspicillatus            |     | 1   |     |     |     |     |     |     |     |     |     |     |
| S. rubroviolaceus            | 1   |     | 6   |     | 2   |     |     |     |     |     | 1   |     |
| Juvenile Scarus              |     |     | 12  | 3   |     |     |     |     |     |     |     |     |
| ACANTHURIDAE                 |     |     |     |     |     |     |     |     |     |     |     |     |
| Zebrasoma flavescens         |     | 19  | 2   |     |     |     | 1   | 3   |     | 2   | 1   | 6   |

Table IV-6 (continued)

|                                 | 1     | 1     | 2     | 2     | 3     | 3     | 4     | 4     | 5     | 5     | 6     | 6     |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| TRANSECT NUMBER                 | 1     | 1     | 2     | 2     | 3     | 3     | 4     | 4     | 5     | 5     | 6     | 6     |
| TRANSECT DEPTH                  | 15'   | 40'   | 10'   | 30'   | 10'   | 30'   | 25'   | 40'   | 20'   | 50'   | 20'   | 40'   |
| FISH SPECIES                    |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Acanthurus achilles</i>      | 1     |       |       | 1     | 1     |       |       |       |       | 1     |       |       |
| <i>A. leucopareus</i>           | 1     |       |       |       |       |       |       |       |       |       |       |       |
| <i>A. olivaceus</i>             | 1     |       |       |       |       |       |       |       |       |       | 2     |       |
| <i>A. dussumieri</i>            | 2     |       |       |       | 4     |       |       |       |       |       |       |       |
| <i>A. blochii</i>               | 4     |       |       |       | 2     |       |       |       |       |       |       |       |
| <i>A. nigrofuscus</i>           | 17    |       | 19    | 11    | 17    | 4     | 5     | 1     |       |       |       |       |
| <i>Ctenochaetus strigosus</i>   |       | 24    | 6     | 4     | 3     | 11    | 4     | 4     | 3     | 4     | 5     | 15    |
| <i>Naso litteratus</i>          | 1     |       | 7     |       | 3     |       | 1     |       |       | 6     | 10    | 3     |
| <i>N. unicornis</i>             |       |       |       |       | 1     |       | 1     |       |       |       | 1     |       |
| ZANCLIDAE                       |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Zanclus canescens</i>        | 2     | 2     |       |       |       | 2     |       | 1     |       |       | 2     | 4     |
| MONOCANTHIDAE                   |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Pervagor spilosoma</i>       | 12    | 8     | 6     | 26    | 21    | 18    | 15    | 28    | 8     | 15    | 15    | 12    |
| <i>P. aspricaudus</i>           | 1     |       |       |       | 1     |       |       |       |       |       |       |       |
| BALISTIDAE                      |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Rhinecanthus rectangulus</i> | 3     |       | 3     |       | 1     |       | 1     | 1     |       |       | 2     |       |
| <i>Suffalamem bursa</i>         |       | 1     | 1     |       |       | 2     |       |       |       |       |       |       |
| <i>Melichthys vidula</i>        |       |       | 1     |       | 1     |       |       |       |       |       |       |       |
| <i>M. niger</i>                 |       |       |       |       |       | 1     |       |       |       |       |       |       |
| OSTRACIONTIDAE                  |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Ostracion meleagris</i>      | 1     |       |       |       |       |       |       |       |       |       |       |       |
| NUMBER SPECIES                  | 21    | 15    | 21    | 15    | 20    | 19    | 13    | 13    | 3     | 12    | 22    | 14    |
| NUMBER INDIVIDUALS              | 86    | 97    | 97    | 63    | 84    | 70    | 40    | 47    | 13    | 42    | 70    | 80    |
| SPECIES DIVERSITY               | 2.472 | 2.205 | 2.647 | 2.002 | 2.373 | 2.458 | 2.099 | 1.617 | 0.925 | 2.027 | 2.697 | 2.442 |

The high proportion of sand cover at Hapuna Bay points to a low potential for impact. Organisms in the area are capable of withstanding the stress associated with large natural sediment loads due to the natural conditions of sea and swell which result in the frequent suspension of large amounts of sediment in the water column. According to Dollar, the communities existing in Hapuna Bay are adapted to these extreme conditions and will undoubtedly be unaffected by additional input from land-based development.

Likewise, runoff during construction is not expected to increase sediment loads since the climate is extremely dry. In the event of heavy rainfall, most of the water will percolate through the porous soil and surface rock layers to the water table, followed by groundwater extrusion at the shoreline. Such groundwater flow will not transport sediment to the ocean since the basal rock acts as a filter.

In fact, the only major impact of rain during grading might be to significantly decrease the amount and distribution of airborne dust -- a beneficial side effect.

#### **4.2.1.2 Impact on Endangered or Threatened Marine Species**

Because there are no plans for modification of the shoreline, potential impacts to marine mammals and turtles are negligible. A literature review conducted by Darby-Ebisu & Associates (1984) for the Waikoloa Beach Resort EIS indicated that the noise from heavy construction equipment has no apparent adverse effects on major marine mammals.

Likewise, short term changes in water quality resulting from construction will not be of a magnitude to affect the behavior of sea turtles who might inhabit the area. Because access to the shoreline is presently unrestricted, any human-induced effects to turtle populations have probably already occurred. The potential for additional impact must be considered very slight.

#### **4.2.2 Permanent Impacts**

Because the proposed project will not involve any shoreline modification, permanent impacts on the nearshore and marine environment will be minimal. Concerns have been raised regarding the effects of agricultural chemicals and the use of treated sewage effluent for irrigation, so these are specifically addressed below. Other potential impacts discussed include the possible increase in groundwater extrusion and changes in shoreline access and recreational use.

##### **4.2.2.1 Impact of Agricultural Chemicals**

The proposed development of South Kohala Resort will require application of fertilizers to supply essential plant nutrients to turf and ornamental plants, as well as pesticides to control their associated weed and insect pests. In response to concerns that these chemicals may adversely impact the quality of groundwater and/or offshore waters, studies were conducted by Richard E. Green, Ph.D., and Charles L. Murdoch, Ph.D. (see Appendix C and D), to address the following:

- a. What is the likelihood that significant quantities of chemicals applied to the golf course and to landscaped areas of hotel and housing areas would reach the coastline at any time during or after completion of the development?
- b. What is the likelihood that significant quantities of chemicals would reach the groundwater aquifer at any time during or after completion of the development?
- c. What is the likelihood that chemicals used would, by drift during application or by volatilization after application, be a source of contamination of the environment that would pose a health hazard?

To provide answers to these questions, Green and Murdoch examined the Mauna Kea Resort experience. This resort has been in existence for 23 years. Development, construction, and management of the adjacent South Kohala Resort will likely be quite similar. Climate, soils, geology, topography, hydrology, vegetation, and other environmental conditions are essentially the same in the two sites. By studying the impact of fertilizers, pesticides, and herbicides applied in the maintenance of the Mauna Kea Resort, a reasonable assessment of the effect of such chemicals applied to the proposed development on the quality of shoreline and groundwaters should be possible.

#### 4.2.2.1.1 Hydrology

Of particular interest is the likelihood of runoff and deep percolation which would carry chemicals to beach areas. However, the South Kohala coastal area is the driest in the state: mean annual rainfall at the proposed development is less than 10 inches (250 mm); monthly averages range from 0.4 inches (10 mm) or less in the summer, to about 2 inches (50 mm) in January; and the mean rainfall for most months is 1 inch (25 mm) or less. Moreover, evapotranspiration (ET) from frequently irrigated turf in this area is probably close to pan evaporation. On clear, sunny days, pan evaporation is approximately 0.3 inches (8 mm) per day or 9.4 inches (240 mm) per month. Thus, the monthly potential ET is nearly 10 times the monthly rainfall, so there would seldom be any deep percolation in this area unless it results from over-irrigation.

A review of irrigation practices for the Mauna Kea Golf Course shows that the fairways are irrigated with 1 inch of water per week, and tees and greens with 2 inches per week. This is not excessive. Additionally, the dry soils take in water rapidly, so runoff is not a frequent occurrence. Mr. Robert Itamoto, Golf Course Superintendent at Mauna Kea Resort, confirms that water seldom flows in the natural drainageways, even during the rainy season. The grassed areas of the fairways also apparently intercept runoff from adjacent steep areas, thereby decreasing the quantity of runoff water reaching the coastline.

Figure IV-2 shows the drainage patterns for the proposed South Kohala Resort; only two out of six drainage areas reach the coastline at Hapuna Bay. The other four all drain through the Mauna Kea Resort. Of these four, two drainage areas reach the coastline in rough, undeveloped areas. The other two reach the coastline at Kauna'oa Bay. Water flowing from one of the two drainage areas that do reach Hapuna Bay comes almost entirely from undeveloped

property outside the South Kohala Resort site. An analysis of runoff volume shows that the proposed development accounts for only approximately one percent of the total area drained and approximately three percent of the volume of water during peak flow (100 year, 6 hour storm) in drainageways which reach the Hapuna coastline. In the event that surface runoff of fertilizers or pesticides did occur, it would likely be sufficiently diluted by runoff from undeveloped areas and rendered unmeasurable.

Groundwater now pumped by Mauna Kea Resort from two wells is brackish and not used for human consumption. Continuous application of nitrogen-containing fertilizers to the golf course could result in leaching of nitrate to the brackish aquifer under conditions of high rainfall or over-irrigation. However, given the low rainfall, high rate of evapotranspiration, conservative irrigation practices, and low application rates of herbicides and insecticides, not much penetration to the groundwater is expected. Also, chemicals which are likely to be mobile in the soil with infiltrating water (such as 2,4-D and metribuzin) are readily degraded in the soil.

#### **4.2.2.1.2 Management Practices**

Information about fertilization, pesticide application, and irrigation for the golf course, hotel grounds, and housing areas was obtained from the Mauna Kea Resort Golf Course Superintendent and Hotel Grounds Superintendent. It is assumed that maintenance of the proposed South Kohala Resort will be very similar to that of the existing resort.

Chemicals used are listed in Table IV-7. Note that pesticides are used in relatively small amounts. The total nitrogen (N) applied in fertilizers is given in the table because it is the only nutrient element in fertilizers which is both mobile and could possibly have a negative environmental impact.

There is little chance that drift or volatilization of chemicals applied would pose a hazard to guests or the general public. Drift hazards are usually associated with aerial applications, and all chemical applications on the proposed resort (as is the case at Mauna Kea Resort) will be from low pressure, ground spray equipment, which are relatively free from drift hazards. In addition, chemicals are normally applied during early mornings, when guests or the public are not present and when wind conditions are the calmest.

With the exception of dicamba, which is a minor component of a herbicide used in small quantities on the golf course, the chemicals used in maintenance at Mauna Kea Resort are of low volatility.

#### **4.2.2.1.3 Analysis of Water Samples at Kauna'oa Bay**

As part of their study, Green and Murdoch recommended that shoreline water samples be taken from brackish water seepage sites at opposite ends of Kauna'oa Bay to assess the movement of agricultural chemicals from the Mauna Kea Resort to shoreline waters via groundwater. Quantitative data could then be obtained on the potential for contamination of shoreline or groundwaters by agricultural chemicals at the proposed South Kohala Resort.

Table IV-7

## Agricultural Chemicals Used at Mauna Kea Resort

FERTILIZERS:

| <u>Location</u>           | <u>Total Area</u> | <u>Material</u>       | <u>Frequency</u> | <u>Rate/Appli.</u> | <u>Total N/Year</u> |
|---------------------------|-------------------|-----------------------|------------------|--------------------|---------------------|
| Golf Course Fairways      | 70 acres          | 16-4-8<br>or 16-4-4   | Every<br>6 weeks | 250 lb./ac.        | 12.1 tons           |
| Golf Course Greens & Tees | 6 acres           | 16-4-8                | Every<br>4 weeks | 270 lb./ac.        | 1.7 tons            |
| Hotel Grounds and Housing | 60 acres          | 14-14-14<br>or 16-4-6 | Every<br>7 weeks | 167 lb./ac.        | 6.0 tons            |
|                           |                   | 6-20-20               | --               | --                 | 0.25 tons           |
|                           |                   | Osmocote<br>14-14-14  | --               | --                 | 0.56 tons           |

HERBICIDES:

| <u>Location</u>           | <u>Total Area</u> | <u>Material</u>                                                                                    | <u>Frequency</u>         | <u>Rate/Appli.</u> | <u>Total Per Year</u> |
|---------------------------|-------------------|----------------------------------------------------------------------------------------------------|--------------------------|--------------------|-----------------------|
| Golf Course Perimeter     | 18 acres          | Paraquat                                                                                           | Every 4 mo.              | 1 qt./ac.          | 13.5 gal.             |
|                           |                   | Roundup                                                                                            | Every 4 mo.              | 1 qt./ac.          | 13.5 gal.             |
| Golf Course Fairways      | 70 acres          | WeedHoe                                                                                            | Spot sprays<br>as needed | 1.3 qt./ac.        | 50 gal.               |
|                           |                   | Sencor                                                                                             | Spot sprays<br>as needed | 0.5 lb./ac.        | 75 lbs.               |
|                           |                   | 33 Plus                                                                                            | Spot sprays<br>as needed | 1 pint/ac.         | 4 gal.                |
|                           |                   | Surflan                                                                                            | Spot sprays<br>as needed | 1 pint/ac.         | 5 gal.                |
| Golf Course Greens & Tees | 6 acres           | None (Greens are hand weeded, herbicides for tees are included in the spot sprays as needed above) |                          |                    |                       |
| Hotel Grounds and Housing | 60 acres          | Roundup                                                                                            | Spot sprays              | 1.0 qt./ac.        | 20 gal.               |
|                           |                   | Weedhoe                                                                                            | Spot sprays              | 1.3 qt./ac.        | 16 gal.               |
|                           |                   | Surflan                                                                                            | Spot sprays              | 1 pint/ac.         | 10 gal.               |

INSECTICIDES:

| <u>Location</u>           | <u>Total Area</u> | <u>Material</u> | <u>Frequency</u>     | <u>Rate/Appli.</u> | <u>Total Per Year</u> |
|---------------------------|-------------------|-----------------|----------------------|--------------------|-----------------------|
| Golf Course Fairways      | 70 acres          | None            |                      |                    |                       |
| Golf Course Greens & Tees | 6 acres           | Sevin           | 2 to 3<br>times/year | --                 | 100 lbs.              |
| Hotel Grounds and Housing | 60 acres          | Isotox          | As needed            | --                 | 9.0 gal.              |
|                           |                   | Volk Oil        | As needed            | --                 | 15.0 gal.             |
|                           |                   | Pyronon         | As needed            | --                 | 4.5 gal.              |

Note: Some of the key properties of environmental significance of these chemicals are given in Appendix C, Table 2.

Because of the quantities applied (much higher than herbicides or insecticides), solubility, and potential movement from the site, total nitrogen and nitrates were the most logical chemicals to test. The assumption was that in the absence of evidence of enrichment of shoreline waters with inorganic nitrogen, it was highly unlikely that any pesticides applied to the golf course, hotel grounds, or housing areas would have moved to shoreline waters.

All samples were collected in the early morning at low tide on a day with minimal wind and wave mixing activity, at a depth of about 10 centimeters, about 3 meters from the shoreline. Location of the four stations is shown in Figure IV-4. Station 1, about a quarter mile north of Kauna'oa Bay, and Station 4, at the north end of Hapuna Bay, represent areas where ground water seepage is from areas not subject to contamination by agricultural chemicals. Stations 2 and 3, at the north and south ends of Kauna'oa Bay, are sites of brackish water seepage from the Mauna Kea Resort.

Concentrations of inorganic nitrogen (nitrate plus nitrite and ammonium) and total dissolved nitrogen (TDN) in samples taken at the four sites are given in Table IV-8. These results indicate that nitrogen from the Mauna Kea Resort has not enriched the groundwater and subsequently shoreline waters in areas where brackish water seeps to the ocean.

In general, TDN is about two times the level of the inorganic nitrogen constituents and is a satisfactory indicator of N level in the water. The very low TDN level at Station 3 and relatively low level at Station 2 suggest negligible movement of fertilizer nitrogen from where it is applied to groundwater and subsequently to shoreline waters. Given the relative amounts applied and relative solubility, there is even less likelihood of pesticide contamination of shoreline waters.

Comparison of the TDN data in Table IV-8 with those for shoreline waters in other areas in Hawaii provides additional evidence that the waters of Kauna'oa Bay are not enriched by fertilizer nitrogen. Lau et. al. have reported a mean TDN of 0.11 mg/l for samples taken from Kahana Bay on Oahu, with a high of 0.30, a low of 0.05, and a standard deviation of 0.057 mg/l (Lau, L.S. et. al., 1973). Kahana Bay receives discharge from an undeveloped, non-agricultural watershed. It is suggested that this coastal area may represent a good standard for class AA waters in Hawaii. Note that the TDN values for Stations 2 and 3 at Kauna'oa Bay are within the range of values measured for the Kahana Bay samples.

Additionally, the TDN concentrations in the Kauna'oa Bay samples can be compared with Waihole Ditch water on Oahu, derived principally from high elevation groundwater not subject to agricultural contamination. Hufen et. al. found that it contained 0.4 mg/l nitrate -- exceeding the TDN concentrations of any of the shoreline water samples from Kauna'oa and Hapuna Bays (Hufen, T.H., D. Eyre, and W. McConachie, 1980).

Therefore, Green and Murdoch conclude that development of the South Kohala Resort in a manner similar to that of the Mauna Kea Resort is unlikely to cause contamination of Hapuna Bay by agricultural chemicals used in accordance with established practices.



TABLE IV-8

Concentrations (mg/l) of Inorganic N and Total  
Dissolved Nitrogen (TDN) in Shoreline Waters Near Apparent  
Groundwater Seepage Areas Along the South Kohala Coast, Hawaii\*

| <u>Station</u> | <u>Location</u>        | <u>Nitrate +<br/>Nitrite N</u> | <u>Ammonium N<br/>mg/l</u> | <u>TDN</u> |
|----------------|------------------------|--------------------------------|----------------------------|------------|
| 1              | North of Kauna'oa Bay  | 0.075                          | 0.002                      | 0.151      |
| 2              | North end Kaunaoa Bay  | 0.121                          | 0.001                      | 0.204      |
| 3              | South end Kaunaoa Bay  | 0.008                          | 0.003                      | 0.092      |
| 4              | North end Hapuna Beach | 0.160                          | 0.002                      | 0.255      |

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\* Sampling and analysis by Dr. Steven Dollar; letter and report of results of chemical analysis are contained in Appendix D. The original data, reported in micromoles per liter, were transformed and presented here in milligrams per liter (mg/l) (approximately equal to parts per million) for ease of comparison with values from other areas.

This conclusion is supported by the findings of Richard W. Grigg and Steven J. Dollar in a review of the literature on coral reef pollution, in which they found no documented examples of pesticide problems anywhere in the world. Furthermore, there has been no substantial evidence of pesticide damage of coral reefs on the Kona coast or the Big Island. (Reference: Grigg, R.W. and S.J. Dollar. (In press). Natural and anthropogenic disturbance on coral reefs.)

#### 4.2.2.2 Impact of Irrigation with Treated Sewage Effluent

The South Kohala Resort plans call for construction of a golf course that can be irrigated with treated sewage effluent, thus conserving potable water. Potential impact on aquatic ecosystems owing to high rates of nutrient loading must be considered. Eutrophication -- that is, the increased growth of a portion of the community that is able to directly utilize the nutrients -- sometimes occurs under these conditions, generally at the expense of the normal community. The overall result of this process is usually a degradation of environmental quality.

At Hapuna Bay, however, no such impacts whatsoever are anticipated, primarily due to tides, currents, eddies, wind, and wave action which promote rapid dilution and water exchange. With this unrestricted circulation, buildup of nutrient materials is unlikely.

Moreover, much of the nutrient load will be taken up by the golf course vegetation. In a study of a golf course on Oahu irrigated with treated sewage effluent, Chang and Young reported that essentially none of the nutrient load reached the marine environment through groundwater runoff; 98 percent of the total nitrogen and 100 percent of the total phosphorus was taken up by the soil-plant surface layer (Chang, S.Y.K., and R.H.F. Young, 1977).

Adverse impact is also unlikely because of the secondary level of sewage treatment commonly used by resort developments. Studies of several ocean discharges on Oahu of much greater volume than that anticipated for the proposed project indicate no detrimental effects whatsoever.

It should be noted that, should it be used, only a minimal amount of treated effluent will be available for irrigation, and it will have to be mixed with brackish water to provide enough water to irrigate the golf course. Furthermore, the likelihood of the effluent posing any hazards to residents will be extremely low due to the fact that it will be chlorinated at the wastewater treatment plant prior to being used for irrigation purposes. Sufficient precautions will be taken to minimize the probability of malfunction in the proposed resort's waste treatment system, including the installation of backup pumps and an emergency power generator. Plant operation procedures, such as the daily monitoring of effluent to detect any discharge of micro-organisms, will provide additional margins of safety against the release of pathogens into the environment at unacceptable levels. In addition, proper buffering between the proposed residential units and areas irrigated with treated wastewater will be provided. Condition 7 imposed upon SMA Use Permit (SMA 85-1b) states: "All proposed buildings shall observe a minimum setback of 100 feet from the edge of the fairways/greens/tee area of the abutting golf course."

#### 4.2.2.3 Impact of Increased Volume of Groundwater Extrusion

Dollar concludes that the increase in the volume of groundwater extrusion, and resulting change in water chemistry owing to changes in shoreline characteristics, is likely to be insignificant. Normal volumes of groundwater extrusion in South Kohala range in the neighborhood of 5-6 mgd per mile, causing a surface lens during periods of calm weather. At Waikoloa, a much larger development than the proposed South Kohala Resort, it is estimated that the annual discharge of stormwater runoff is roughly equivalent to the amount of groundwater which enters the ocean each day (U.S. Army Corps of Engineers, 1985).

#### 4.2.2.4 Changes to Shoreline Access and Recreational Use

Construction of the South Kohala Resort at the north end of Hapuna Bay will not affect public access to the shoreline. Currently, most users reach the shoreline through Hapuna Beach State Recreation Area. This is the most convenient access since parking is situated close to the beach and facilities are available at the park. A few users choose to walk from Mauna Kea Resort to the north end of Hapuna Beach via public shoreline access trail dedicated in perpetuity by Mauna Kea Properties.

The beach fronting the proposed project will remain available for recreational use by the public. Observations during both the peak winter season and the summer indicate that public use of the north end of Hapuna Beach is relatively light compared to the beach park portion of the bay. Most likely, the convenient parking and amenities provided at the beach park account for this. It is possible that with development of the resort, recreational use of the north portion of the beach will be enhanced.

A complete discussion of shoreline access and recreational use is contained in Chapter V, Section 6, of this EIS.

## 5.0 TERRESTRIAL FLORA

### 5.1 EXISTING CONDITIONS

Earthwatch, environmental resource investigators, undertook a botanical survey of the project site in March 1984 (see Appendix E). The objectives were to survey existing vegetation types, inventory the flora, and search for any endangered plant species, in order to assess the probable impacts of development. Intensive field surveys were conducted throughout three study areas: the uplands mauka of the Queen Ka'ahumanu Highway, The High Bluffs and golf course site makai of the highway, and the site of the hotel, beach club, and tennis complex along the shoreline. Those areas likely to support important native plant species were surveyed more intensely.

Results of the field survey indicate the presence of four major vegetation cover types:

**Open Scrub Grassland.** Characterized predominantly by grasses and forbs, with scattered shrubs and trees generally composing less than 25 percent of the cover. Predominant cover type in the mauka uplands and The High Bluffs

site. Important species: buffelgrass, pili grass, feathery pennisetum, 'emo-loa, pa'u-o-hi'i-aka, 'ilima, hi'aloa, koa-haole, and kiawe.

**Kiawe Woodland.** Composed of trees and shrubs (15-25 feet tall) which form a dense canopy (greater than 60% cover) near the coast and in gulches or depressions. Occurs to some extent in all areas; predominant cover type of the hotel site. Important species: feathery pennisetum, nettle-leaved goosefoot, koali-'awania, sisal, and kiawe.

**Coastal Strand.** Characterized by strand vegetation associated with beaches and rocky cliffs; trees, shrubs, and vines in sand substrate; low-lying forbs and grasses in lava rock substrate. Occurs in the hotel site. Important species: pohuehue, beach dropseed, nena, nohu, naupaka-kahakai, kiawe, hau, tree heliotrope.

**Disturbed/Landscaped.** Characterized by exotic weeds and ornamentals typical of disturbed areas such as roadsides, golf course fringes, and trails; occurs in all three areas. Important species: fountain grass, bristly foxtail, garden spurge, Asiatic pennywort, castor bean, bougainvillea, coconut palm.

No proposed, listed, or candidate endangered or threatened plant species were observed in the survey areas. The vegetation is typical of dry leeward areas where kiawe and exotic weeds and grasses have replaced most native species. No remnant patches of native dry forest (wiliwili or 'ohe) were observed. Although remnants of native grasslands (pili grass and 'emo-loa) were observed, some are still commonly found throughout the islands while others, although not rare, are found less commonly today, such as those species observed along the shoreline (nena, nohu, pa'u-o-hi'i-'aka).

## 5.2 PROBABLE IMPACTS AND MITIGATION MEASURES

The study concludes that although there will be an initial loss of vegetation, no significant adverse environmental impacts relative to flora are anticipated as a result of the development. Plants observed at the project site are primarily exotic species commonly found throughout Hawaii, and none are endangered or threatened plant species.

Clearing, grading, and construction will have varying degrees of probable impact on the existing vegetation. Certain guidelines will be followed as a means of lessening adverse impacts on existing vegetation:

**Use of Native Species.** In all three survey areas, it is anticipated that some portions will be left intact where possible, allowing the incorporation of natural landscape elements, including existing endemic trees and shrubs, into the development.

**Conservation of Limited Resources.** Selection of drought-tolerant plants for landscaped areas will reduce water needs, although overall increases in water use are anticipated to support the landscaping. Depending on the selection of plant species, landscaping could result in an increase in the occurrence of native plant species.

## 6.0 BIRDS AND WILDLIFE

### 6.1 EXISTING CONDITIONS

Biologist Phillip Bruner conducted an ornithological and feral mammal field survey of the South Kohala Resort lands during a two-day period in February 1984. The survey covered the same three sites studied by Earthwatch in its botanical survey. No endangered species of birds or mammals were observed.

#### 6.1.1 Birds

**Mauka Lands.** The most abundant species found was the Japanese Quail, probably due to the extensive open grasslands which provide a suitable habitat. Noteworthy was the sighting of four Mourning Doves, an uncommon species in Hawaii. A single Pueo (Hawaiian Owl) was the only native bird observed during the survey.

**The High Bluffs/Golf Course Site.** This site harbors an abundance of Zebra Dove (formerly known as Barred Dove) and Warbling Silverbill. Gray Francolin and Spotted Dove are quite common.

**Hotel/Beach Club/Tennis Club Site.** Numerous sightings were made of Warbling Silverbill, Gray Francolin, and Zebra Dove. Along the rocky shoreline, the exposed shelf at low tide serves as an important foraging site for Pacific Golden Plover, Wandering Tattler, and Ruddy Turnstone.

#### 6.1.2 Mammals

The mongoose is the most common mammal in all three areas -- 2 were observed on the mauka lands, 9 on the High Bluffs site, and 13 on the hotel/beach club/tennis club site. Also observed in the latter site was one feral cat; the tracks of a feral cat were found on the mauka site.

The endangered Hawaiian hoary bat (Lasiurus cinereus semotus) occurs on the island of Hawaii. Most sightings have been recorded in Hilo and in the relatively wet forests at higher elevations. However, in September 1984, a dead specimen was found on the grounds of the Sheraton Royal Waikoloa Hotel. Since then, there have been no reports of Hawaiian hoary bats seen in the vicinity.

### 6.2 PROBABLE IMPACTS AND MITIGATION MEASURES

A wide assemblage of species, mostly exotic, was observed at all three survey areas. It is anticipated that the planned development will result in larger numbers of Pacific Golden Plover. An indigenous migratory bird, it does not currently occur on the mauka lands, but with development of the golf course, it will be attracted by the short grassy areas created along the fairways. On the other hand, establishment of the golf course is expected to decrease the populations of Gray Francolin, Japanese Quail, Zebra Dove, and Warbling Silverbill.

Other species expected to increase due to habitat alteration -- primarily the wetter conditions -- include the House Sparrow, Northern Cardinal, Common Mynah, and Japanese White-eye.

Mongoose and feral cats might become more common and have an impact on the small numbers of ground nesting birds, such as Japanese Quail and Gray Francolin. However, the mauka lands are not unique and these species can be expected to be found in similar habitats in the vast undeveloped areas of West Hawaii.

Regarding potential impacts on the Hawaiian hoary bat, the Fish and Wildlife Service of the U.S. Department of Interior stated the following opinion in a letter to the U.S. Army Engineer District (February 22, 1985):

Impacts of the Hawaiian hoary bat would not be expected to seriously harm the bat population on the island of Hawaii. It does not seem likely that the construction and operation of the resort complex would change the environment to the bats' detriment unless insecticides are used heavily. If such pesticides are used, bats may be affected due to decrease in their food supply and, possibly, secondary poisoning. Such negative impacts would not likely jeopardize the continued existence of the species as a whole.

This letter was written in response to the proposed resort development at Waikoloa Beach Resort. Since the South Kohala Resort is similar to the type of development planned for Waikoloa Resort, a similar conclusion can be drawn regarding its potential impacts on the Hawaiian hoary bat. And as discussed in a previous section, insecticides will not be heavily used, as is the practice at the existing Mauna Kea Resort.

## **7.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES**

### **7.1 EXISTING CONDITIONS**

#### **7.1.1 Historical Setting**

The South Kohala coastal region, an area of considerable historical interest and significance, has been the subject of numerous archaeological studies. The site of the proposed South Kohala Resort is situated in the ahupua'a of Ouli -- ahupua'a being the fundamental geographic unit of social and economic organization in the islands. Typically, the ahupua'a was a strip of land extending from the sea to the mountains. Fishing, agriculture, and other activities were carried out by the local community. Archaeological findings on Ouli lands show that the early residents subsisted mainly on fishing, the production of salt, and agriculture. In general, the population on the coast was sparse compared to the more habitable uplands.

The Hapuna coastal area was considered important to the early Hawaiians because of its ideal landing sites and excellent fishing grounds. Accounts of early voyagers to Hawaii in the 1800s indicate that nearby Kawaihae was a popular anchorage and heavily traveled area, important in terms of politics, economics, and religion. Three noteworthy heiau are located in the vicinity: Mo'okini Heiau at Upolu Point and Pu'ukohola Heiau and Mailekini Heiau at Kawaihae.

#### **7.1.2 Studies and Surveys**

The entire area of the proposed South Kohala Resort has undergone extensive archaeological investigation. Following is a summary of archaeological studies

conducted in relation to the subject project, as well as earlier studies of the site.

#### **7.1.2.1 Mauka Lands**

In January 1979, Archaeological Research Center Hawaii (ARCH) conducted an archaeological reconnaissance of approximately 400 acres of Olohana Corporation (Mauna Kea Properties' successor) property at Ouli. A small number of World War II era structures and other evidence of military occupation were discovered, but ARCH concluded that these remains are of no archaeological or historical significance. Further, it was found that the study area does not contain sites or structures giving evidence of historic or prehistoric occupation. ARCH recommended that archaeological clearance be granted to the mauka parcel and that no further investigation be conducted.

Extensive archaeological investigations of the proposed corridor and adjacent areas for the planned Waimea-Kawaihae Highway were performed in 1983 by the Bishop Museum (Clark and Kirch, 1983). The corridor constitutes the mauka boundary of the South Kohala Resort site. Although the majority of the structures located in the vicinity of the mauka border appeared to be of military origin, built during World War II, the Bishop Museum study concluded that Hawaiians probably made temporary use of the area for hunting and collecting. Two sites of possible Hawaiian origin were found near the South Kohala Resort site, but appear to be outside of its boundaries.

These two studies by ARCH and the Bishop Museum were reviewed by the Division of State Parks, Department of Land and Natural Resources, and to verify the results, staff archaeologists inspected the mauka lands in March 1984 (letter of April 11, 1984, to Belt, Collins & Associates). A number of cultural features which appear to represent a range of types classified in the Bishop Museum report were discovered, and some were thought to be of Hawaiian origin. The State archaeologists concluded that the sites are not of sufficient significance to warrant further archaeological testing and excavation. As part of the field inspection, the State archaeologists completed recordation of the sites, in accordance with accepted professional practice. Based on the results of the survey, the Division of State Parks recommended that no further archaeological work be done on the mauka parcel prior to development.

Archaeological surveys of the mauka lands, as well as those of the makai lands, have been reviewed by the County of Hawaii Planning Department and found "adequate as informational requirements for various land use permit applications." (Letter of January 6, 1984, to Belt, Collins & Associates.)

#### **7.1.2.2 Makai Lands**

Most of the work to date has concentrated on the traditionally more heavily populated and widely used makai section of the South Kohala Resort project site. The most recent study was an archaeological reconnaissance, intensive survey, and testing of the project area makai of Queen Kaahumanu Highway, conducted by Alan T. Walker and Paul H. Rosendahl of Paul H. Rosendahl, Ph.D., Inc. (PHRI) during September 1985 (see Appendix G). This study was carried out specifically for the subject project.

Twenty-five sites were identified within the study area, of which 19 were newly recorded. The range of formal feature types encountered included the following: platform/enclosure, L-shaped terrace, L-shaped wall segment, wall segment, surface artifact/midden concentration, trail, road, terrace wall, double C-shape, C-shape, rectangular mound, cairn, boulder alignment, recent historic refuse, and historic wooden structure. See Table IV-9 for a summary of identified sites and features.

### 7.1.2.3 Summary of Findings, Impacts and Mitigation Measures

PHRI determined that 23 of the 25 identified archaeological sites are significant solely for their information content. (See Table IV-10 for a summary of general significance assessments and recommended general treatments for all identified archaeological sites.) PHRI states that sufficient data were collected from the 23 sites during their reconnaissance, intensive survey, and testing. These sites are deemed to no longer contain endangered significant information and therefore PHRI states that no further data collection or other mitigative measures can be justifiably recommended for the sites. See Figure 2 in Appendix G for the site location map of all identified archaeological sites.

Two sites are recommended for preservation. Site 5629, the Kauna'oa Point Complex (shown in Figure IV-5), is located partially within the project site. The complex consists of nine features and three are situated within the hotel parcel: a platform/enclosure (F), an L-shaped terrace (probably a habitation feature) (H), and a surface artifact and midden concentration (I). PHRI determined that the Kauna'oa Point Complex is significant for its information content and is an excellent example of a site type. It recommends that the site be preserved, with some level of interpretive development, including appropriate further data collection. The developer intends to preserve the Kauna'oa Point Complex and to include it in its overall site and landscaping plan.

A second site, a portion of Trail 9, was determined to be significant for its information content, as an excellent type of a site type, and for its cultural value. It is a coastal-oriented foot trail consisting of a worn depression without kerbstones or rock alignments. Although there are limited physical remains, the trail is visible in the vicinity of Kauna'oa Point Complex; it continues off the project site, along the coast toward Kauna'oa Bay. The trail appears to follow a route similar to that of the Kawaihae-Puako Trail, a pre-historic/early history foot trail. The visible portion of Trail 9 near the Kauna'oa Point Complex is recommended for preservation, with some level of interpretive development. PHRI states that no further data collection is necessary for this site. The developer intends to preserve identifiable portions of this trail.

The recommendations made by PHRI will be followed to minimize impacts of development on the two significant sites identified. These sites will be accessible to the public via the shoreline trail. It is recognized that there is always the possibility, however remote, that previously unidentified archaeological sites may be discovered during construction. Should this occur, work in the immediate area would stop and not resume until the County Planning Department and State Department of Land and Natural Resources have been contacted and given clearance to proceed.



Table IV-9

SUMMARY OF IDENTIFIED SITES AND FEATURES  
SOUTHERNMOST PORTION OF SOUTH KOHALA RESORT  
(TMK:3-6-6-02:37; 3-6-2-02:12)

| Site &<br>Feature<br>Number  | Formal<br>Site/Feature<br>Type                  | Tentative<br>Functional<br>Interpretation | *Significance<br>Evaluation |   |   | Recommended<br>Action | Comments                                                                                                                                                    |
|------------------------------|-------------------------------------------------|-------------------------------------------|-----------------------------|---|---|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                                                 |                                           | R                           | I | C |                       |                                                                                                                                                             |
| <u>Previously Identified</u> |                                                 |                                           |                             |   |   |                       |                                                                                                                                                             |
| 5629<br>F                    | Complex (3)#<br>Platform/<br>enclosure          | Habitation                                | H                           | H | L | Int.Sur.<br>Testing   | Portable remains<br>include marine shell<br>midden, coral, water-<br>worn basalt, and vol-<br>canic glass arti-<br>facts; excellent<br>excavation potential |
| H                            | L-shaped terrace                                |                                           |                             |   |   |                       |                                                                                                                                                             |
| I                            | Surface artifact<br>and midden<br>concentration |                                           |                             |   |   |                       |                                                                                                                                                             |
| Trail 9                      | Foot trail                                      | Transportation                            | M                           | H | M | Preserve              | Preserve for shore-<br>line access; pres-<br>ently utilized by<br>hikers and fisher-<br>men                                                                 |
| Road 10                      | Road                                            | Transportation                            | L                           | L | L | None                  | Historic Kawaihae-<br>Puako Road                                                                                                                            |
| T-113                        | Cairn                                           | Boundary marker                           | L                           | L | L | None                  | Located near <u>ahupua'a</u><br>boundary                                                                                                                    |
| T-114                        | Cairn                                           | Boundary marker                           | L                           | L | L | None                  | Located near <u>ahupua'a</u><br>boundary                                                                                                                    |
| T-115                        | Cairn                                           | Boundary marker                           | L                           | L | L | None                  | Located near <u>ahupua'a</u><br>boundary                                                                                                                    |
| <u>Newly Identified</u>      |                                                 |                                           |                             |   |   |                       |                                                                                                                                                             |
| T-101                        | Terrace<br>wall                                 | Building<br>foundation                    | L                           | L | L | None                  | Recently constructed;<br>associated with<br>recreation facilities                                                                                           |
| T-102                        | Terrace<br>wall                                 | Road<br>foundation                        | L                           | L | L | None                  | Recently constructed;<br>associated with<br>recreation facilities                                                                                           |

\*Significance Evaluation--Nature: R = scientific research, I = interpretive,  
C = cultural;  
Degree: H = high, M = moderate, L = low.

#Number of component features within complex.

Table IV-9  
(continued)

| Site &<br>Feature<br>Number | Formal<br>Site/Feature<br>Type | Tentative<br>Functional<br>Interpretation | Significance<br>Evaluation |   |   | Recommended<br>Action | Comments                                                                                 |
|-----------------------------|--------------------------------|-------------------------------------------|----------------------------|---|---|-----------------------|------------------------------------------------------------------------------------------|
|                             |                                |                                           | R                          | I | C |                       |                                                                                          |
| T-103                       | Terrace<br>wall                | Barbecue area<br>foundation               | L                          | L | L | None                  | Recently constructed;<br>associated with<br>recreation facilities                        |
| T-104<br>A                  | Complex (2)<br>Double C-shape  | Habitation                                | M                          | L | L | None                  | Central wall divides<br>Fea. A into two<br>"rooms"; shell midden                         |
| B                           | Collapsed<br>C-shape           |                                           |                            |   |   |                       |                                                                                          |
| T-105                       | L-shaped wall                  | Shelter                                   | L                          | L | L | None                  | Partially altered by<br>bulldozing; very<br>sparse shell midden                          |
| T-106                       | Rectangular<br>mound           | Habitation                                | L                          | L | L | None                  | Partially altered by<br>bulldozing; very<br>sparse shell midden                          |
| T-107                       | C-shape                        | Shelter                                   | L                          | L | L | None                  | Recently constructed<br>military shelter                                                 |
| T-108                       | Collapsed<br>C-shape           | Shelter                                   | L                          | L | L | None                  | No shell midden                                                                          |
| T-109                       | C-shape                        | Shelter                                   | L                          | L | L | None                  | No shell midden                                                                          |
| T-110                       | Cairn                          | Boundary marker                           | L                          | L | L | None                  | Located near <u>ahupua'a</u><br>boundary                                                 |
| T-111                       | Cairn                          | Undetermined                              | L                          | L | L | None                  | No portable remains<br>or trail visible in<br>area                                       |
| T-112                       | Cairn                          | Boundary marker                           | L                          | L | L | None                  | Recently constructed<br>on property boundary;<br>contains wood pole<br>and wire supports |
| T-116                       | Cairn                          | Undetermined                              | L                          | L | L | None                  | No portable remains<br>or trail visible in<br>area                                       |
| T-117                       | Boulder<br>alignment           | Undetermined                              | L                          | L | L | None                  | Stacked boulders form<br>short north-south<br>alignment                                  |

Table IV-9  
(continued)

| Site &<br>Feature<br>Number | Formal<br>Site/Feature<br>Type | Tentative<br>Functional<br>Interpretation | Significance<br>Evaluation |   |   | Recommended<br>Action | Comments                                               |
|-----------------------------|--------------------------------|-------------------------------------------|----------------------------|---|---|-----------------------|--------------------------------------------------------|
|                             |                                |                                           | R                          | I | C |                       |                                                        |
| T-118                       | Cairn                          | Undetermined                              | L                          | L | L | None                  | No portable remains<br>or trail visible in<br>area     |
| T-119                       | Wall segment                   | Shelter                                   | L                          | L | L | None                  | No portable remains                                    |
| T-120                       | Enclosure                      | Habitation                                | M                          | L | L | None                  | Interior soil area<br>has shell midden                 |
| T-121                       | Historic<br>refuse             | Habitation                                | L                          | L | L | None                  | Historic glass,<br>ceramic, and metal<br>items present |
| T-122                       | Historic<br>structure          | Habitation                                | L                          | L | L | None                  | Wood and corrugated<br>iron platform<br>and animal pen |

Table IV-10

**SUMMARY OF GENERAL SIGNIFICANCE ASSESSMENTS  
AND RECOMMENDED GENERAL TREATMENTS**

| Site or<br>Feature No. | Significance Category |          |          |          | Recommended Treatment |          |          |          |
|------------------------|-----------------------|----------|----------|----------|-----------------------|----------|----------|----------|
|                        | A                     | X        | B        | C        | FDC                   | NFW      | PID      | PAI      |
| 5629                   | +                     | -        | +        | -        | +                     | -        | +        | -        |
| <b>Subtotal: 1</b>     | <b>1</b>              | <b>0</b> | <b>1</b> | <b>0</b> | <b>1</b>              | <b>0</b> | <b>1</b> | <b>0</b> |
| Trail 9                | -                     | +        | +        | +        | -                     | -        | +        | -        |
| <b>Subtotal: 1</b>     | <b>0</b>              | <b>1</b> | <b>1</b> | <b>1</b> | <b>0</b>              | <b>0</b> | <b>1</b> | <b>0</b> |
| Road 10                | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-101                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-102                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-103                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-104                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-105                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-106                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-107                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-108                  | -                     | +        | -        | -        | -                     | +        | -        | -        |
| T-109                  | -                     | +        | -        | -        | -                     | +        | -        | -        |

**General Significance Categories:**

- A=Important for information content, further data collection necessary (PHRI=research value);  
 X=Important for information content, no further data collection necessary (PHRI=research value, SHPO=not significant);  
 B=Excellent example of site type at local, region, island, state, or national level (PHRI=interpretive value); and  
 C=Culturally significant (PHRI=cultural value).

**Recommended General Treatments:**

- FDC=Further data collection necessary (intensive survey, test excavations, and/or data recovery [mitigation excavations]);  
 NFW=No further work of any kind necessary, sufficient data collected, archaeological clearance recommended, minimal preservation potential (possible inclusion into landscaping suggested for consideration);  
 PID=Preservation, with some level of interpretive development recommended (including appropriate related data recovery work); and  
 PAI=Preservation "as is," with no further work (possible inclusion into landscaping suggested for consideration).

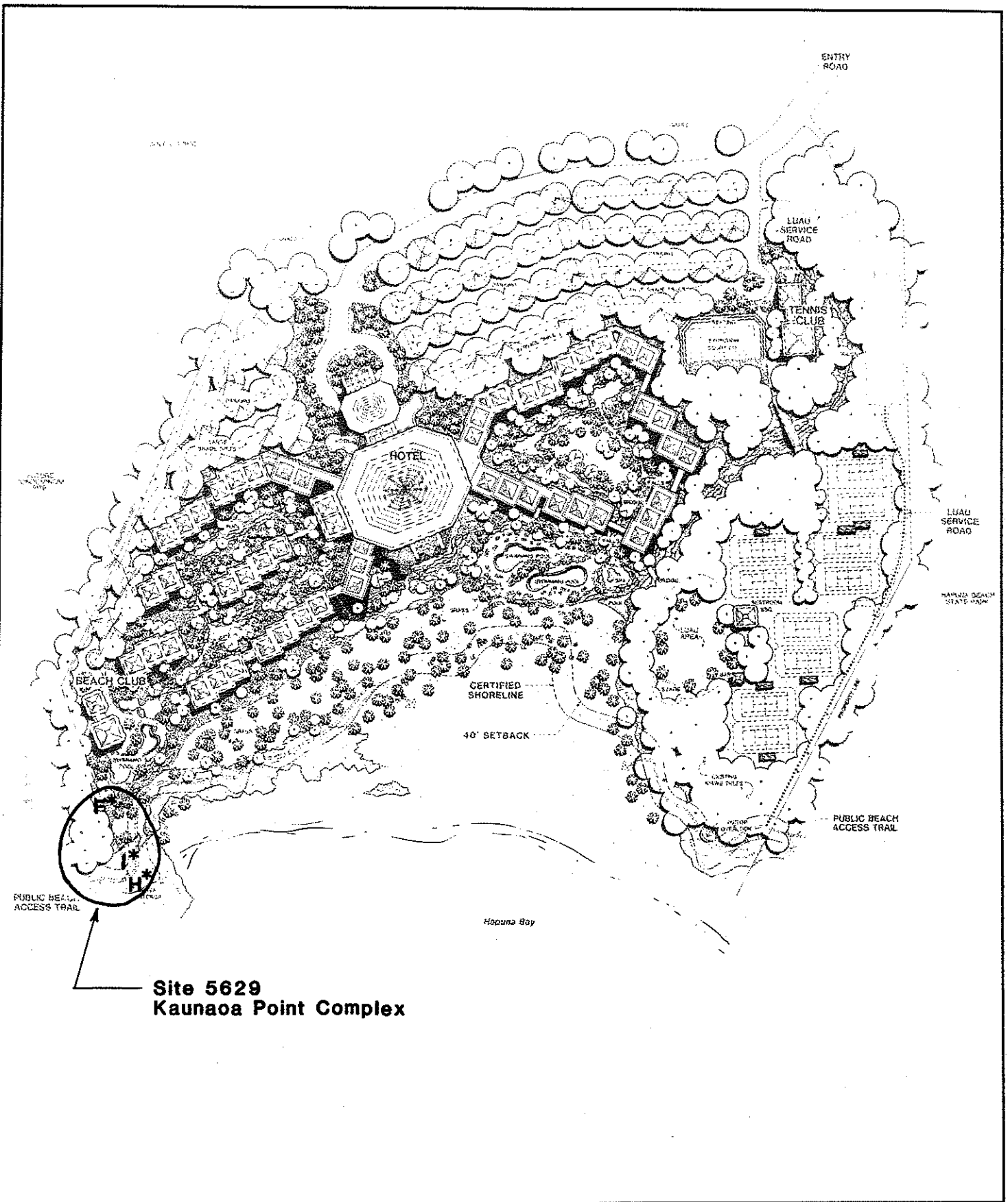
Table IV-10  
(continued)

| Site or<br>Feature No. | Significance Category |           |          |          | Recommended Treatment |           |          |          |
|------------------------|-----------------------|-----------|----------|----------|-----------------------|-----------|----------|----------|
|                        | A                     | X         | B        | C        | EDC                   | NEW       | PID      | PAI      |
| T-110                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-111                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-112                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-113                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-114                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-115                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-116                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-117                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-118                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-119                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-120                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-121                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| T-122                  | -                     | +         | -        | -        | -                     | +         | -        | -        |
| <b>Subtotal: 23</b>    | <b>0</b>              | <b>23</b> | <b>0</b> | <b>0</b> | <b>0</b>              | <b>23</b> | <b>0</b> | <b>0</b> |
| <b>Total: 25</b>       | <b>1</b>              | <b>24</b> | <b>2</b> | <b>1</b> | <b>1</b>              | <b>23</b> | <b>2</b> | <b>0</b> |

Two sites are recommended for preservation. Site 5629, the Kauna'oa Point Complex (shown in Figure IV-5), is located partially within the project site. The complex consists of nine features and three are situated within the hotel parcel: a platform/enclosure (F), an L-shaped terrace (probably a habitation feature) (H), and a surface artifact and midden concentration (I). PHRI determined that the Kauna'oa Point Complex is significant for its information content and is an excellent example of a site type. It recommends that the site be preserved, with some level of interpretive development, including appropriate further data collection. The developer intends to preserve the Kauna'oa Point Complex and to include it in its overall site and landscaping plan.

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The recommendations made by PHRI will be followed to minimize impacts of development on the two significant sites identified. These sites will be accessible to the public via the shoreline trail. It is recognized that there is the possibility that previously unidentified archaeological sites may be discovered during construction. Should this occur, work in the immediate area would stop and not resume until the County Planning Department and State Department of Land and Natural Resources have been contacted and given clearance to proceed.



**Site 5629  
Kaunaoa Point Complex**

100 50 0 100 200 300 400  
SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987



**Figure IV-5  
LOCATION OF ARCHAEOLOGICAL SITES**

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

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## *CHAPTER V*

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## CHAPTER V

### DESCRIPTION OF THE AFFECTED ENVIRONMENT AND PROBABLE ENVIRONMENTAL CONSEQUENCES -- SOCIO-ECONOMIC ENVIRONMENT AND PUBLIC SERVICES

#### 1.0 SOCIO-ECONOMIC CONSIDERATIONS

#### 1.1 PAST AND PRESENT SOCIO-ECONOMIC CONDITIONS

The following sections examine the past and present socio-economic conditions on the Island of Hawaii, the primary study area, and the secondary study area. For the purposes of this report, the primary study area is identified as the North and South Kohala districts. The secondary study area consists of North and South Kona and Honoka'a.

##### 1.1.1 Island of Hawaii

The Island of Hawaii contains over 4,000 square miles of land area, representing 62 percent of the total area of the State. The U.S. Census Bureau reports that the island's resident population was 92,691 as of 1980. The estimated population for mid-1985 had grown to 109,159, an 18 percent increase (Hawaii State Department of Planning & Economic Development, 1986). In general, the economy of Hawaii has been on the upswing. During 1986, gross business receipts and tax collections showed gains over the previous year. The total labor force and the number of people employed also saw substantial increases of 10 percent and 9 percent, respectively (First Hawaiian Bank, September/October 1986). As a result, the number of jobs in the county jumped up by 8 percent during the year. The monthly average unemployment rate during 1986 was 7.8 percent.

##### 1.1.1.1 Economic Activities

Tourism is quickly becoming the major economic factor on the Island of Hawaii. After several years of decline, the industry has made significant progress since 1985 and the future appears to be even brighter. Total visitor expenditures reached \$285.9 million in 1985, an increase of 60 percent since 1981. The total inventory of hotel and resort condominium units in February 1986 was 5,226 and 2,041, respectively. During 1985, the monthly average hotel occupancy rate was 57.6 percent. The most recent figures (November 1986) show that the occupancy rate had risen to 64.4 percent (Pacific Business News, January 12, 1987, p. 9).

The result of the closing of the Puna Sugar Co. in September of 1984 was an 18 percent decrease in the island's production of sugar during 1985. The three remaining companies, Hamakua Sugar, Hilo Coast Processing Co., and Ka'u Agribusiness Co., are hoping for improvements in the sugar price support levels in order to maintain stable operations. In the meantime, they are exploring alternative activities such as the production of electricity, sugarcane syrups, macadamia nuts, and cattle feedlot operations (Hawaii Business, November 1986, p. 34).

In contrast to sugar production, diversified crops continued to increase in overall production and value. The \$79.1 million value of production in 1985 represents a 16 percent increase over the previous year. The livestock industry has remained stable during the 1980's, with production totaling over \$22 million in 1985 (Ibid, p. 36).

The importance of high tech industries to the county's economy is evidenced by the expansion of existing operations and the introduction of new ones. New observatories are under construction atop Mauna Kea, and additional support facilities are underway in Waimea and Hilo. The Natural Energy Laboratory of Hawaii (NELH), adjacent to the Ke-ahole Airport, is increasing the commercialization of aquaculture projects that have until recently been generally experimental in nature. Successful operations are expected to move or expand into the neighboring Hawaii Ocean Science Technology (HOST) Park, which began construction at the end of 1986.

These economic activities, plus others such as retail sales, construction, and the production of energy from alternative energy sources, all combine to form a broad foundation for the island's economy, although tourism remains clearly dominant.

#### **1.1.1.2 Settlement Patterns**

Hawaii Island is dominated by five large shield volcanoes (Mauna Kea, Mauna Loa, Hualalai, Kohala, and Kilauea), which create a great diversity in climate. This diversity has strongly influenced the settlement of the island. The eastern, or "windward," slopes of the island are wet, with rainfall exceeding 300 inches per year in some areas. The western, or "leeward," side of the island is largely very dry, with some locations considered to have true desert conditions.

With irrigation less of a requirement, agricultural lands on the windward side of the island became widely used for sugar production. The natural deep-water harbor at Hilo had for many years made the area a center of population on the island. Hilo became the natural port for the shipment of sugar to the west coast and the town grew along with the expansion of the industry. By 1980, Hilo's population of 35,269 represented nearly 40 percent of the entire county total. Many small communities along the windward side, from North Kohala all the way to the southern part of the island in Ka'u, originated due the influence of sugar production.

The dry conditions in leeward Hawaii create an ideal situation for ranching activities. Such activities have indeed played a major role in the area and are responsible for growth in the Waimea area. To the south in the Kona area, the production of coffee was a major force for settlement patterns until the 1960's when the area began to experience a tourist industry "boom."

#### **1.1.1.3 Demographic and Housing Data**

Tables V-1 through V-4 provide detailed demographic and housing data from the U.S. Census Bureau for years 1970 and 1980. Information is shown for the entire County of Hawaii and for individual districts or census tracts that are used for determining the primary and secondary study areas. Some noteworthy characteristics or changes that occurred during the decade of the 1970's in the county include the following:

Table V-1:  
Total Population and Demographic Breakdowns: County of Hawaii, and Primary and Secondary Study Areas, 1970 and 1980

|                                                   | COUNTY OF HAWAII |        | SOUTH KOHALA<br>(C.T. 217) |       | NORTH KOHALA<br>(C.T. 218) |       | NORTH KONA<br>(C.T. 215-216) |        | SOUTH KONA<br>(C.T. 213-214) |       | HONOKAA-<br>KUKUIHAELE<br>(C.T. 219) |       |
|---------------------------------------------------|------------------|--------|----------------------------|-------|----------------------------|-------|------------------------------|--------|------------------------------|-------|--------------------------------------|-------|
|                                                   | 1970             | 1980   | 1970                       | 1980  | 1970                       | 1980  | 1970                         | 1980   | 1970                         | 1980  | 1970                                 | 1980  |
| <b>TOTAL POPULATION</b>                           | 63,468           | 92,053 | 2,310                      | 4,607 | 3,326                      | 3,249 | 4,832                        | 13,748 | 4,004                        | 5,914 | 2,829                                | 3,287 |
| <b>ETHNICITY*</b>                                 | %                | %      | %                          | %     | %                          | %     | %                            | %      | %                            | %     | %                                    | %     |
| Caucasian                                         | 28.8             | 35.0   | 39.2                       | 46.5  | 25.6                       | 27.8  | 44.0                         | 53.8   | 17.7                         | 30.0  | 36.9                                 | 37.9  |
| Japanese                                          | 37.5             | 26.6   | 24.4                       | 14.6  | 23.8                       | 16.1  | 23.1                         | 11.8   | 39.6                         | 27.5  | 30.0                                 | 24.9  |
| Chinese                                           | 2.9              | 1.7    | 1.3                        | 1.4   | 4.3                        | 1.0   | 3.7                          | 1.6    | 0.8                          | 0.8   | 2.7                                  | 1.9   |
| Filipino                                          | 16.5             | 13.9   | 6.6                        | 5.6   | 29.2                       | 24.0  | 8.4                          | 7.2    | 26.2                         | 13.0  | 21.8                                 | 21.9  |
| Hawaiian                                          | 12.3             | 18.8   | 26.4                       | 28.5  | 15.3                       | 24.7  | 19.3                         | 22.1   | 14.7                         | 23.5  | 7.1                                  | 12.2  |
| Other                                             | 2.0              | 4.1    | 2.0                        | 3.4   | 1.7                        | 6.4   | 1.5                          | 3.5    | 1.0                          | 5.2   | 1.4                                  | 1.9   |
| <b>AGE</b>                                        |                  |        |                            |       |                            |       |                              |        |                              |       |                                      |       |
| Less than 5 yr.                                   | 8.6              | 9.1    | 9.3                        | 10.2  | 10.0                       | 9.2   | 9.1                          | 9.1    | 9.0                          | 9.8   | 7.6                                  | 9.4   |
| 5 - 17 yr.                                        | 27.8             | 21.5   | 28.3                       | 23.6  | 29.4                       | 22.9  | 27.0                         | 20.3   | 29.8                         | 20.7  | 27.1                                 | 22.3  |
| 18 - 64 yr.                                       | 54.4             | 59.2   | 56.1                       | 58.6  | 51.1                       | 54.4  | 55.7                         | 63.9   | 48.9                         | 58.8  | 55.0                                 | 54.5  |
| 65 or more yr.                                    | 9.2              | 10.2   | 6.4                        | 7.7   | 9.5                        | 13.6  | 8.2                          | 6.7    | 12.4                         | 10.6  | 10.3                                 | 13.8  |
| Median age (yr.)                                  | 28.9             | 29.4   | 28.1                       | 29.3  | 27.3                       | 31.9  | 28.6                         | 28.9   | 29.7                         | 29.7  | 31.6                                 | 32.2  |
| <b>PLACE OF BIRTH*</b>                            | %                | %      | %                          | %     | %                          | %     | %                            | %      | %                            | %     | %                                    | %     |
| Hawaii                                            | NC               | 70.5   | NC                         | 64.9  | NC                         | 75.6  | NC                           | 54.4   | NC                           | 71.2  | NC                                   | 77.2  |
| Other U.S.**                                      | NC               | 20.0   | NC                         | 30.4  | NC                         | 13.6  | NC                           | 39.9   | NC                           | 20.8  | NC                                   | 9.5   |
| Foreign country                                   | NC               | 9.4    | NC                         | 4.7   | NC                         | 10.8  | NC                           | 5.7    | NC                           | 7.8   | NC                                   | 13.3  |
| <b>RESIDENCE 5 YRS. AGO</b><br>(people aged 5+)   |                  |        |                            |       |                            |       |                              |        |                              |       |                                      |       |
| Same house                                        | 62.5             | 52.9   | 45.6                       | 50.7  | 49.9                       | 68.9  | 51.1                         | 38.8   | 56.1                         | 57.4  | 66.2                                 | 68.3  |
| Same island                                       | NC               | 24.9   | NC                         | 17.3  | NC                         | 12.1  | NC                           | 28.1   | NC                           | 22.9  | NC                                   | 16.5  |
| Different island                                  | NC               | 8.1    | NC                         | 14.9  | NC                         | 4.4   | NC                           | 7.0    | NC                           | 6.5   | NC                                   | 8.9   |
| Different state                                   | NC               | 11.1   | NC                         | 16.4  | NC                         | 11.6  | NC                           | 23.1   | NC                           | 10.7  | NC                                   | 4.3   |
| Different country                                 | NC               | 3.1    | NC                         | 0.7   | NC                         | 3.1   | NC                           | 3.0    | NC                           | 1.2   | NC                                   | 2.0   |
| <b>EDUCATION* (selected-<br/>people aged 25+)</b> |                  |        |                            |       |                            |       |                              |        |                              |       |                                      |       |
| 0-8 years only                                    | 37.2             | 20.1   | 24.1                       | 8.6   | 44.2                       | 29.0  | 28.9                         | 8.0    | 26.1                         | 23.6  | 45.7                                 | 30.3  |
| Hi school only                                    | 31.6             | 35.5   | 34.2                       | 37.0  | 30.0                       | 39.0  | 66.0                         | 40.9   | 21.9                         | 33.8  | 27.5                                 | 35.7  |
| College, 4+ yr.                                   | 7.5              | 15.2   | 13.1                       | 20.7  | 5.9                        | 8.1   | 8.8                          | 18.8   | 6.4                          | 12.4  | 5.3                                  | 9.8   |

Notes: \*Figures based on 15% sample; hence, numbers represent estimate.

\*\*Including persons born in U.S. territories, and persons born abroad or at sea to American parent/s.

"NC" = 1970 categories or bases "Not Comparable" to 1980 (1970 Census kept a "non-response" category, while 1980 Census allocated non-responses to other categories shown).

Sources: U.S. Bureau of the Census, 1970 Census of Population and Housing--Census Tracts--Honolulu, Hawaii, PHC(1)-88; 1980 Summary Tape Files 1-A and 3-A; State of Hawaii, 1973, Community Profiles for Hawaii.

Table V-2:  
Family Characteristics and Income Levels: County of Hawaii, and Primary and Secondary Study Areas, 1970 and 1980

|                            | COUNTY OF HAWAII |          | SOUTH KOHALA<br>(C.T. 217) |          | NORTH KOHALA<br>(C.T. 218) |          | NORTH KONA<br>(C.T. 215-216) |        | SOUTH KONA<br>(C.T. 213-214) |       | HONOKAA-<br>KUKUIHAELE<br>(C.T. 219) |       |
|----------------------------|------------------|----------|----------------------------|----------|----------------------------|----------|------------------------------|--------|------------------------------|-------|--------------------------------------|-------|
|                            | 1970             | 1980     | 1970                       | 1980     | 1970                       | 1980     | 1970                         | 1980   | 1970                         | 1980  | 1970                                 | 1980  |
| POPULATION IN FAMILIES     | N/A              | 81,728   | N/A                        | 4,114    | N/A                        | 2,961    | N/A                          | 11,543 | N/A                          | 5,235 | N/A                                  | 3,042 |
| as % of total population   | N/A              | 88.8%    | N/A                        | 89.3%    | N/A                        | 91.1%    | N/A                          | 84.0%  | N/A                          | 88.5% | N/A                                  | 92.4% |
| NUMBER OF FAMILIES         | 14,533           | 22,825   | 533                        | 1,204    | 741                        | 826      | 1,131                        | 3,339  | 848                          | 1,378 | 654                                  | 862   |
| HEAD                       | %                | %        | %                          | %        | %                          | %        | %                            | %      | %                            | %     | %                                    | %     |
| Husband/wife               | 87.1             | 82.1     | 90.1                       | 79.7     | 88.0                       | 84.0     | 87.4                         | 84.0   | 88.3                         | 83.4  | 87.8                                 | 91.1  |
| Male only                  | 5.2              | 5.2      | 3.6                        | 7.6      | 6.7                        | 6.2      | 4.1                          | 4.7    | 4.4                          | 6.1   | 7.3                                  | 2.4   |
| Female only                | 7.7              | 12.7     | 6.4                        | 12.7     | 5.3                        | 9.8      | 8.5                          | 11.4   | 7.3                          | 10.5  | 4.9                                  | 6.5   |
| WITH OWN CHILDREN UNDER 18 | 57.4             | 52.7     | 63.2                       | 51.6     | 58.0                       | 52.2     | 53.4                         | 54.4   | 59.3                         | 51.5  | 56.4                                 | 48.5  |
| Female head                | 4.0              | 7.4      | 4.5                        | 9.1      | 2.2                        | 5.9      | 5.0                          | 4.8    | 3.5                          | 5.4   | 3.1                                  | 4.3   |
| BELOW POVERTY LEVEL        | 9.7              | 10.3     | 11.8                       | 5.7      | 10.5                       | 12.2     | 13.0                         | 8.0    | 17.3                         | 9.8   | 10.4                                 | 9.4   |
| 1980 MEDIAN FAMILY INCOME  | \$19,132         | \$17,924 | \$15,7194                  | \$21,100 | \$19,128                   | \$19,107 |                              |        |                              |       |                                      |       |

Notes: All figures (except "Population in Families") based on 15% sample; hence, numbers represent estimates. "N/A" = "Not Available" in published form. However, other published 1970 and 1980 census data lead to the conclusion that families generally comprised a smaller percentage of Hawaii's 1970 population than of the 1980 total.

Sources: U.S. Bureau of the Census, 1970 Census of Population and Housing--Census Tracts--Honolulu, Hawaii, PHC(1)-88; 1980 Summary Tape File 3-A; State of Hawaii, 1973, Community Profiles for Hawaii.

Table V-3: Labor Force Size and Characteristics: County of Hawaii, and Primary and Secondary Study Areas, 1970 and 1980

|                                                      | COUNTY OF HAWAII |        | SOUTH KOHALA<br>(C.T. 217) |       | NORTH KOHALA<br>(C.T. 218) |       | NORTH KONA<br>(C.T. 215-216) |        | SOUTH KONA<br>(C.T. 213-214) |       | HONOKAHAU<br>KUKUIHALE<br>(C.T. 219) |       |
|------------------------------------------------------|------------------|--------|----------------------------|-------|----------------------------|-------|------------------------------|--------|------------------------------|-------|--------------------------------------|-------|
|                                                      | 1970             | 1980   | 1970                       | 1980  | 1970                       | 1980  | 1970                         | 1980   | 1970                         | 1980  | 1970                                 | 1980  |
| <b>POTENTIAL LABOR FORCE (aged 16+)</b>              | 43,075           | 67,205 | 1,446                      | 3,290 | 2,240                      | 2,286 | 3,632                        | 10,115 | 2,629                        | 4,265 | 2,092                                | 2,418 |
| not in lab. force                                    | 39.5             | 38.7   | 34.2                       | 35.9  | 38.4                       | 39.8  | 44.3                         | 27.8   | 41.6                         | 33.8  | 40.6                                 | 46.7  |
| armed forces                                         | 0.4              | 0.3    | 0.0                        | 0.0   | 1.1                        | 1.0   | 0.0                          | 0.1    | 0.0                          | 0.0   | 0.2                                  | 0.0   |
| civil. lab. force                                    | 60.1             | 61.0   | 65.8                       | 64.1  | 60.5                       | 59.3  | 55.7                         | 72.1   | 58.4                         | 66.2  | 59.2                                 | 53.3  |
| <b>CIVILIAN LABOR FORCE</b>                          | 25,889           | 41,006 | 951                        | 2,110 | 1,355                      | 1,355 | 2,022                        | 7,293  | 1,535                        | 2,823 | 1,238                                | 1,289 |
| % unemployed                                         | 2.7              | 7.0    | 4.1                        | 6.3   | 1.9                        | 9.2   | 4.8                          | 5.2    | 2.3                          | 5.7   | 1.9                                  | 5.4   |
| <b>TOTAL EMPLOYED</b>                                | 25,180           | 38,150 | 912                        | 1,978 | 1,330                      | 1,230 | 1,925                        | 6,913  | 1,500                        | 2,662 | 1,215                                | 1,220 |
| <b>OCCUPATION</b>                                    | %                | %      | %                          | %     | %                          | %     | %                            | %      | %                            | %     | %                                    | %     |
| service manager./profes. technical, sales & adminis. | 16.3             | 16.5   | 15.9                       | 18.0  | 25.9                       | 34.2  | 19.3                         | 21.5   | 16.0                         | 17.3  | 19.5                                 | 11.2  |
| farm/fish/forest                                     | NC               | 20.0   | NC                         | 20.6  | NC                         | 15.2  | NC                           | 21.2   | NC                           | 13.6  | NC                                   | 12.5  |
| precision, craft, repair                             | NC               | 26.1   | NC                         | 19.2  | NC                         | 13.7  | NC                           | 28.2   | NC                           | 24.8  | NC                                   | 18.9  |
| operators, fabri-                                    | NC               | 10.3   | NC                         | 14.0  | NC                         | 14.2  | NC                           | 7.1    | NC                           | 19.5  | NC                                   | 12.6  |
| cators, laborers                                     | NC               | 12.7   | NC                         | 16.5  | NC                         | 9.7   | NC                           | 12.1   | NC                           | 14.8  | NC                                   | 17.5  |
|                                                      | NC               | 14.4   | NC                         | 11.8  | NC                         | 12.9  | NC                           | 9.9    | NC                           | 10.0  | NC                                   | 27.3  |
| <b>INDUSTRY (selected)</b>                           |                  |        |                            |       |                            |       |                              |        |                              |       |                                      |       |
| agric., forest, fish, mining                         | 12.5             | 11.2   | N/A                        | 16.8  | N/A                        | 8.1   | N/A                          | 6.2    | N/A                          | 19.4  | N/A                                  | 16.2  |
| construction                                         | 10.6             | 9.1    | 13.6                       | 12.3  | 2.6                        | 5.0   | 23.6                         | 11.2   | 20.4                         | 14.3  | 9.9                                  | 8.0   |
| manufacturing                                        | 15.0             | 8.3    | 2.3                        | 5.1   | 29.3                       | 8.1   | 1.0                          | 1.9    | 3.2                          | 1.2   | 26.4                                 | 29.4  |
| retail trade                                         | 14.8             | 17.5   | 15.9                       | 13.8  | 2.9                        | 7.0   | 13.1                         | 23.6   | 8.9                          | 18.4  | 10.3                                 | 13.8  |
| financial, insur., real estate                       | 2.8              | 5.7    | 3.5                        | 7.6   | 1.1                        | 2.3   | 4.0                          | 8.6    | 3.5                          | 4.5   | 0.4                                  | 1.2   |
| personal, entert. & recreat. serv.                   | 11.2             | 10.9   | N/A                        | 16.0  | N/A                        | 31.4  | N/A                          | 20.7   | N/A                          | 15.2  | N/A                                  | 6.6   |
| health, educ. & professional                         | 14.1             | 16.7   | 13.9                       | 14.8  | 14.7                       | 20.5  | 7.8                          | 11.4   | 18.3                         | 13.1  | 5.9                                  | 7.1   |
| public adminis.                                      | 6.5              | 7.3    | 3.1                        | 2.1   | 5.5                        | 8.1   | 4.2                          | 2.7    | 3.7                          | 4.8   | 8.6                                  | 5.3   |
| <b>COMMUTE TO WORK</b>                               |                  |        |                            |       |                            |       |                              |        |                              |       |                                      |       |
| 45 minutes + (%)                                     | N/A              | 6.0    | N/A                        | 13.9  | N/A                        | 22.6  | N/A                          | 4.8    | N/A                          | 6.8   | N/A                                  | 13.4  |
| mean travel (min.)                                   | N/A              | 16.5   | N/A                        | 21.7  | N/A                        | 24.1  | N/A                          | 16.4   | N/A                          | 20.6  | N/A                                  | 17.6  |

Notes: All figures based on 15% sample; hence, numbers represent estimates. "N/A" = "Not Available" in published form. "NC" = 1970 categories or bases "Not Comparable" to 1980 Census. Sources: U.S. Bureau of the Census, 1970 Census of Population and Housing--Census Tracts--Honolulu, Hawaii, PHC(1)-88; 1980 Summary Tape File 3-A; State of Hawaii, 1973, Community Profiles for Hawaii.

Table V-4:  
Housing Stock and Characteristics: County of Hawaii and West Hawaii Study Area, 1970 and 1980

|                                        | COUNTY OF HAWAII |          | SOUTH KOHALA<br>(C.T. 217) |          | NORTH KOHALA<br>(C.T. 218) |          | NORTH KONA<br>(C.T. 215-216) |           | SOUTH KONA<br>(C.T. 213-214) |           | HONOKAA-<br>KUKUIHAELE<br>(C.T. 219) |          |
|----------------------------------------|------------------|----------|----------------------------|----------|----------------------------|----------|------------------------------|-----------|------------------------------|-----------|--------------------------------------|----------|
|                                        | 1970             | 1980     | 1970                       | 1980     | 1970                       | 1980     | 1970                         | 1980      | 1970                         | 1980      | 1970                                 | 1980     |
| <b>TOTAL YEAR-ROUND HOUSING UNITS</b>  | 18,939           | 33,954   | 798                        | 1,959    | 941                        | 1,121    | 1,975                        | 6,894     | 1,131                        | 2,052     | 880                                  | 1,114    |
| vacant (total)                         | % 9.0            | 13.9     | % 18.5                     | 24.3     | % 6.6                      | 8.8      | % 27.4                       | 33.3      | % 6.4                        | 9.7       | % 8.1                                | 6.5      |
| vacant for sale                        | 0.6              | 1.3      | 0.1                        | 2.9      | 0.7                        | 0.3      | 3.2                          | 3.2       | 0.0                          | 2.9       | 0.1                                  | 0.1      |
| vacant for rent                        | 2.0              | 5.5      | 1.9                        | 4.1      | 1.1                        | 1.8      | 8.3                          | 18.9      | 0.3                          | 2.1       | 0.7                                  | 1.1      |
| <b>TOTAL YEAR-ROUND OCCUPIED UNITS</b> | 17,260           | 29,237   | 650                        | 1,483    | 879                        | 1,022    | 1,431                        | 4,602     | 1,059                        | 1,853     | 809                                  | 1,042    |
| TENURE                                 | %                |          | %                          |          | %                          |          | %                            |           | %                            |           | %                                    |          |
| owner-occupied                         | 56.9             | 60.6     | 48.8                       | 59.3     | 66.6                       | 67.7     | 44.7                         | 55.1      | 36.9                         | 52.7      | 59.7                                 | 64.3     |
| renter-occupied                        | 43.1             | 39.4     | 51.2                       | 40.7     | 33.4                       | 32.2     | 55.3                         | 44.9      | 63.1                         | 47.3      | 40.3                                 | 35.7     |
| <b>SELECTED CONDITIONS</b>             |                  |          |                            |          |                            |          |                              |           |                              |           |                                      |          |
| lacking some or all plumbing           | 17.1             | 6.4      | 15.4                       | 2.0      | 17.6                       | 7.3      | 26.3                         | 7.3       | 55.8                         | 28.4      | 17.4                                 | 7.9      |
| 1.51 or more persons/room              | 6.5              | 5.0      | 8.2                        | 5.3      | 9.7                        | 3.1      | 14.1                         | 6.1       | 13.1                         | 10.1      | 4.2                                  | 4.6      |
| PERSONS/HOUSEHOLD                      | 3.61             | 3.09     | 3.51                       | 3.07     | 3.75                       | 3.16     | 3.36                         | 2.92      | 3.71                         | 3.14      | 3.4                                  | 3.1      |
| 1980 MEDIAN RENT (renter-occupied)     |                  | \$223    |                            | \$307    |                            | \$153    |                              | \$331     |                              | \$200     |                                      | \$128    |
| 1980 MEDIAN VALUE* (owner-occupied)    |                  | \$70,300 |                            | \$95,700 |                            | \$64,200 |                              | \$114,000 |                              | \$102,600 |                                      | \$60,600 |

Notes: \* Median values are for non-condominium housing units.

Sources: U.S. Bureau of the Census, 1970 Census of Population and Housing--Census Tracts--Honolulu, Hawaii, PHC(1)-88; 1980 Summary Tape File 1-A; State of Hawaii, 1973, Community Profiles for Hawaii.

- o The ethnic composition of the island's population made some relatively large changes during the 10-year period. The number of Hawaiians as a percentage of the total population increased from 12 to 19 percent, while the percentage of Caucasians increased from 29 to 35 percent. The percentage of Japanese in the population decreased from 38 to 27 percent.
- o The percentage of the population with four or more years of college doubled.
- o The percentage of families living below the poverty level rose slightly to over 10 percent.
- o The size of the civilian labor force grew by more than 15,000, representing a 58 percent increase.
- o The inventory of year-round housing units grew from 18,939 to 33,954, an increase of 79 percent.
- o Home ownership increased during the decade and the percent of units with sub-standard conditions was reduced significantly.

#### 1.1.2 Primary Study Area

The primary study area (North Kohala and South Kohala Districts) is comprised of a single mountain forming a large peninsula on the northern side of the island. The mountain divides the area into a "dry side" on the western slope and a "wet side" to the east. Although ancient Hawaiian society inhabited both portions of the terrain, modern residents have until very recently located most economic and residential activities in the "wet side," which is more suitable for agriculture. The population of the area in 1980 was 7,856. By 1985 it had increased by nearly 25 percent to an estimated 9,761. The increase in tourist activity is generating a growing economy, while creating some strains on the area's infrastructure. The 1986 average unemployment rate in the area was 8.3 percent (Hawaii State Department of Labor and Industrial Relations).

##### 1.1.2.1 Economic Activities

Largely during the last decade, the region's economy has been undergoing a transition from agriculture to tourism. This transition is specific to the South Kohala area, which has an economy very different from that in North Kohala. South Kohala's economy is experiencing rapid growth, while in North Kohala the growth is very limited.

Ranching continues to be a dominant factor shaping the physical character of the primary study area, but tourism has surpassed cattle operations as the leading economic activity during the 1980's. Three hotels along the South Kohala coastline -- the 310-room Westin Mauna Kea, the 543-room Sheraton Royal Waikoloa, and the 351-room Mauna Lani Bay Hotel -- incorporate the great majority of hotel rooms in the area. According to the Hawaii Visitor Bureau's Visitor Plant Inventory of February 1986, there was a total of 1,383 hotel and condominium units in North and South Kohala. A significant proportion of the \$285.9 million generated by the tourist industry in 1985 can be attributed to facilities located in the primary study area.

Diversified agricultural operations play an important role in the economy throughout the primary study area. In North Kohala, the cattle industry utilizes the bulk of the land area and represents a significant source of income for the area. The production of macadamia nuts has recently begun to utilize lands laid fallow with the closing of the sugar plantation in the mid-1970's. Today, there are several hundred acres of macadamia nuts in the area. Flower and nursery products, and to a lesser degree vegetables, are also produced in the area.

Parker Ranch maintains approximately 223,000 owned and leased acres of ranch land and 50,000 head of cattle. Waimea is the most productive area in the State for vegetable crops. Approximately 1,000 acres are used for production in the Lalamilo Homestead area. Major crops include cabbages, celery, lettuce, daikon (turnip), peppers, broccoli, and carrots. Waimea is also a major rose production area.

Kawaihae Harbor is a commercial deep water harbor located in South Kohala. The facility handles receipts and shipments of general cargo, shipments of bulk raw sugar, molasses, lava cinders, petroleum products, and bulk fertilizers. In 1985, the harbor handled 493 million tons of cargo (personal communication, Clement Uemura, Planner, Hawaii State Department of Transportation, August 27, 1986).

The construction industry has grown in the primary study area during recent years. The release of marginal lands by the Parker Ranch has opened the way for residential subdivisions on both the eastern and western sides of Waimea. The availability of Hawaiian Homestead lands has also generated growth. The construction of the Hawaii Belt Highway, the new highway between Kawaihae and Mahukona, and the Queen Kaahumanu highway to North Kona have all increased the accessibility throughout the entire primary study area.

Other diverse elements of the area's economy include the basecamp for the Canada-France-Hawaii Telescope Corporation, which operates an observatory on Mauna Kea, and the Hawaii Preparatory Academy.

#### **1.1.2.2 Settlement Patterns**

Until 1975, North Kohala was dominated by activities related to the cultivation and processing of sugarcane. The area is actually comprised of six villages (Hawi, Kapa'au, Halaula, Makapala, Halawa, and Niulii) and during the past 100 years hosted a number of sugar mills. As was the case with most sugar plantations throughout Hawaii, waves of immigrants were brought in to cultivate the cane in North Kohala, resulting in today's ethnically varied population.

South Kohala encompasses the high plains area of the Kohala mountain foothills, extending down to the dry coastal region which includes the small residential communities of Puako, Kawaihae Village, and Waikoloa Village. South Kohala is dominated by the Parker Ranch, which creates a ranching lifestyle that is still evident in the area, especially in the town of Waimea (also known as Kamuela).



Founded by John Palmer Parker in the early 1800's, the ranch grew under the supervision of Parker's descendants. Featuring a paternalistic provision of human services such as housing and health care similar to the sugar plantations in North Kohala, the ranch spawned a relatively homogeneous community in Waimea. This homogeneity was perpetuated by the relative absence of imported ethnic groups, other than the Spanish cowboys (Paniolos) originally brought to the ranch by its founder. In recent years, this homogeneity has been altered by an influx of second homeowners, young professional families, and resort workers.

### **1.1.2.3 Demographic and Housing Data**

During the 1970's, the most noticeable changes in the character of the primary study area occurred in South Kohala. The following list provides examples of some of the more important observations as seen in Tables V-1 to V-4:

- o While the resident population of South Kohala nearly doubled, the population in North Kohala actually declined slightly.
- o As observed in the county as a whole, Caucasian and Hawaiian populations grew significantly faster than other ethnic groups, while the Japanese population declined substantially.
- o The percentage of South Kohala's population having four or more years of college rose to over 20 percent, much higher than the County average or other areas of the West Hawaii region.
- o The percentage of families below the poverty level increased slightly in North Kohala, but significantly decreased in South Kohala. The 1980 median family income in both areas was well below that for the County as a whole.
- o The entire area experienced a 77 percent increase in year-round housing units between 1970 and 1980. A large proportion of this was in South Kohala, where a sizeable increase in home ownership was also observed.

### **1.1.3 Secondary Study Area**

The secondary study area is comprised of two physically and characteristically distinct regions. North and South Kona are located to the south of the primary study area, and Honoka'a is located to the east. During the 1970's, the North Kona District had the highest growth rate (185 percent) in the County. South Kona also showed significant growth (48 percent). These increases were due to the visitor industry "boom" which centered on the town of Kailua-Kona. Construction of new hotels is moving northward but Kailua-Kona continues to grow as West Hawaii's major economic center. The 1986 average unemployment rate in North and South Kona was 6.0 percent (Hawaii State Department of Labor and Industrial Relations, 1987).

Honoka'a is on the "wet" side of the island and strongly dependent on agricultural operations, primarily sugar. The population grew marginally during the 1970's (an increase of only 458), reflecting the general situation of the sugar industry. Unemployment in the area in 1986 was 6.0 percent.

### 1.1.3.1 Economic Activities

The town of Kailua-Kona in North Kona is the island's major tourist attraction and visitor destination area. It is characterized by an abundance of visitor-oriented activities and related support services for both visitors and residents. According to the Hawaii Visitor Bureau, there were 4,489 hotel and condominium units in the Kona area as of February 1986 (personal communication, Aqua Higa, Research Specialist, February 19, 1987). Recent growth has also occurred at the Keauhou Resort complex south of Kailua.

The Kona region (both North and South districts) has long been recognized for coffee production in its "coffee belt" area. The value of coffee sales during the 1984-85 season totaled \$4.8 million, down from \$6.3 million during the previous season. Despite this decrease, the future prospects of the industry in Kona appear to be promising. Macadamia nuts have become a significant factor in South Kona's economy. A majority of the island's 15,460 acres in crop in 1984 were located in the Honomalino area (Hawaii State Department of Agriculture, 1985). Other major agricultural activities in Kona include cattle ranching, the growing of fruits/citrus crops (avocados, bananas, oranges, and tangerines), and vegetable farming (particularly winter tomatoes).

The Natural Energy Laboratory of Hawaii (NELH) is a major research facility located on 328 acres of shorefront land adjacent to Ke-ahole Airport. It is the only research facility in the world offering both warm and deep cold ocean water for ocean thermal energy conversion (OTEC) research. Several years ago, cold water brought to the surface for OTEC systems was tested to determine if it could be used for growing abalone. The success of these tests led to the initiation of a major commercial demonstration project at NELH. More recently, the Cyanotech Corporation has begun the commercial production of algae for use as food supplements, fertilizers, and pharmaceuticals. Product sales amounted to \$93,000 in 1985. This figure is expected to rapidly increase in the coming years.

Transportation is an important economic activity in Kona. The Ke-ahole Airport, which receives direct scheduled passenger flights from the U.S. mainland, is planned for expansion to facilitate accommodation of return flights overseas and to the mainland. The number of aircraft operations (arrivals and departures) during 1984 totaled 83,320, handling over one million passengers.

In Honoka'a, sugar remains the primary economic activity, although an overall smaller source of employment due to mill consolidations and increased mechanization.

Macadamia nut growing and processing has also become an important agricultural activity in the area. The Hamakua Sugar Co. has also recently opened a feed lot on former sugar land for the production of cattle. Secondary wage earners (e.g., housewives) are also believed to commute to resort jobs in Kohala, although the proportion of the labor force in the Honoka'a-Kukuihaele census tract which was engaged in service occupations actually declined from 20 percent in 1970 to 11 percent in 1980 (see Table V-3).

The town of Honoka'a has, in recent years, undergone a revitalization of commercial activity. Although quantitative data are not readily available, it would appear that employment opportunities created by both an expanding visitor industry and the new "mac nut" operations, coupled with residential growth in the area, have injected new life into the economy.

#### 1.1.3.2 Settlement Patterns

Before the growth of tourism during the 1960's, the Kona region of the Big Island was primarily agricultural in both character and economy. A majority of all working persons were directly involved in agriculture and most others were employed in agricultural support services. Principal activities included coffee production and cattle ranching. Smaller fruit and produce operations also were important in the area.

Wide fluctuations in the world coffee market endangered the stability of the area until the introduction of tourism. Hotels flourished in North Kona, while the neighboring district of South Kona has remained primarily agricultural and little-populated.

The Honoka'a-Kukuihaele area is the most populous along the Hamakua coast. Honoka'a is the principal urban area, marking the northern end of what was once considered the gold coast of the Big Island. The cultivation of sugar has dominated life in this region from the mid-1900's to the present. The construction of the Hamakua ditch in 1876-77 ensured that water from Kohala's "wet side" would be available to irrigate land on the eastern slopes of Mauna Kea. Completion of the irrigation system, together with the development of an elaborate railway network along the Hamakua coast, secured the area as one of the prime cane production regions in the Hawaiian islands.

As with the plantations in Kohala, waves of immigrant laborers followed, contributing to the multi-ethnic composition of today's population. Also, as with the Kohala plantations, sugar production started becoming less profitable due to falling prices on the world market. However, unlike the Kohala plantations which eventually went out of business, operations on the Hamakua coast consolidated as mills began to close. Out of approximately a dozen mills, only two remain.

#### 1.1.3.3 Demographic and Housing Data

Significant demographic characteristics in the secondary study area in 1980 (as shown in Tables V-1 to V-4) include the following:

- o Changes in the ethnic makeup of the Kona region population were similar to those in the primary study area. The North Kona district became more than 50 percent Caucasian by 1980.
- o The North Kona population in particular became characterized by a high degree of transience. Nearly one-third of the 1980 population had been living off-island in 1975. In contrast, only 18 percent of residents in South Kona and 15 percent of those in Honoka'a had been living off-island in 1975.

- o Although there was improvement during the 1970's, the educational level of residents in Honoka'a remained low compared to the County average.
- o The residents of North Kona enjoyed the island's highest median income.

## 1.2 PROBABLE SOCIO-ECONOMIC IMPACTS

### 1.2.1 Introductory Statements

The following socio-economic impact Section 1.2 was prepared on a subcontract basis for Belt Collins & Associates by Community Resources, Inc. (CRI). Their work is based on data sources available as of April 1, 1987.

Many of the following passages -- particularly those applying to cumulative impacts and qualitative social impacts of resort development in general -- also appeared in the recent EIS for the proposed Ritz-Carlton hotel at the Mauna Lani Resort. This reflects a request from the County of Hawaii for consistency, since both EIS's are being prepared in roughly the same timeframe by Belt Collins & Associates and its socio-economic subcontractor CRI.

#### 1.2.1.1 Methodological Requests from County of Hawaii

This socio-economic impact assessment uses a number of new methodological approaches, based on several requests from the Hawaii County Planning Department.

Standardized County Methods: The County Planning Department recently contracted with Decision Analysts Hawaii, Inc. (1986) to recommend standard methodological approaches for estimating West Hawaii resort development impacts on employment, population, and housing. The Department requested that the Decision Analysts Hawaii, Inc. (DAHI) approach be utilized in this EIS unless reasons for alternative approaches could be justified.

CRI has generally followed this new DAHI approach for on-site population and islandwide employment estimates. As noted in later sections, variations of the DAHI approach are used for off-site population and housing impacts.

Cumulative Impacts Over Ten Years: The Planning Department also requested that impact work related to the South Kohala Resort be conducted in a cumulative context, taking into account other West Hawaii resort developments (and new non-resort development) projected to start up during the ten-year period from 1988 to 1998.

At the present time, exact resort developer schedules are available only for the South Kohala Resort, the Ritz-Carlton Mauna Lani, and the Hyatt Regency Waikoloa. A great number of other projects are planned and proposed, but the long lead time required for resort developments (related to permits, architectural plans, and financial factors) makes it unlikely that many other hotels will open during the initial half of the ten-year timeframe. However, to reflect the current push for new development in West Hawaii, a major 500-unit luxury "Hotel X" is assumed to come on-line in July 1991, between the Ritz-Carlton and South Kohala Resort hotel openings. Accordingly, only these projects, which are more likely to be built than others, were included in the analysis for the first five years.

For the second five years, CRI utilized official Hawaii State Department of Planning & Economic Development (1984) forecasts for Big Island resort development to generate a scenario for other new West Hawaii resort openings in the middle and late 1990's. The exact procedure is described in a technical document which has been submitted to the County (Community Resources, Inc., 1987). This method was used for the second five years because, with the exception of the South Kohala Resort residential units and the additional 200 Ritz-Carlton Mauna Lani hotel units, resort developer schedules are lacking.

Table V-5 summarizes the assumed cumulative West Hawaii resort development for the 1988-98 period. It should be noted that the scenario for 1994-98 (based on the official State figures) suggests a sustained level of new resort construction such as the Big Island has never actually historically experienced. This means that impacts for this period may well be overestimated in this report -- i.e., it is in some ways a "worst-case" scenario.

#### **1.2.1.2 Original Research Conducted for this Report**

**Hotel Employee Survey:** Community Resources, Inc. (and Datametric Research, 1987) surveyed employees in the existing two South Kohala luxury hotels -- the Mauna Lani Bay Hotel and the Westin Mauna Kea. Results of this survey (referred to as the "Employee Survey") will be used here to address issues such as housing impacts and social factors related to hotel employment. A copy of the survey report has been filed with the County Planning Department.

**Micro-Computer Modeling:** CRI has developed a number of inter-related new models in response to the County requests for new methods and a cumulative context. These models include population projection methods, employment forecasts, labor supply/demand analyses, and on-site housing impacts. Key features of each model will be briefly discussed in appropriate following sections, but more complete descriptions of the models are contained in a technical document submitted to the County Planning Department (Community Resources, Inc., 1987).

**Social Data for West Hawaii:** In Section 1.2.7, CRI presents results of an original analysis of data on social indicators (e.g., crime rates) vs. resort development, in order to explore possible relationships.

#### **1.2.2 On-Site Population**

On-site population includes both visitors and permanent residents of resort condominium and single-family units. The reason for addressing on-site population separately from off-site population (i.e., new employees and their families) is that the DAHI method requested by the County begins by calculating both on-site population and numbers of permanent jobs from a set of common assumptions about use of resort units (for visitors vs. residents), occupancy rates, and average party size.

These basic assumptions are presented in Table V-6. The following Table V-7 provides an example of the exact methods for calculating resort population (a procedure which also produces some information required for calculating total employment, which will be discussed in a later section). Finally, Table V-8 contains final results, both for the South Kohala Resort and for all cumulative new resort development.

Table V-5:

Assumptions About Total Resort Development

|                                         | Opening Date |           |           |              |           |           |              |           |           |             |             |             | Sub-Totals  |             |             | Total |
|-----------------------------------------|--------------|-----------|-----------|--------------|-----------|-----------|--------------|-----------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
|                                         | 1988 - 1993* |           |           | 1994 - 1998* |           |           | 1994 - 1998* |           |           | 1988 - 1993 | 1994 - 1998 | 1994 - 1998 | 1988 - 1998 |             |             |       |
|                                         | Dec. 1988    | July 1989 | July 1990 | July 1991    | July 1992 | July 1993 | July 1994    | July 1995 | July 1996 | July 1997   | July 1998   | July 1998   | July 1998   | 1988 - 1993 | 1994 - 1998 |       |
| <b><u>SOUTH KOHALA RESORT</u></b>       |              |           |           |              |           |           |              |           |           |             |             |             |             |             |             |       |
| Hotel Units                             | 0            | 0         | 0         | 0            | 0         | 350       | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 350         | 0           | 350   |
| Condominium                             | 0            | 0         | 0         | 0            | 0         | 0         | 90           | 90        | 90        | 90          | 90          | 0           | 0           | 0           | 450         | 450   |
| Single-Family                           | 0            | 0         | 0         | 0            | 0         | 15        | 20           | 20        | 20        | 20          | 20          | 15          | 15          | 15          | 95          | 110   |
| <b><u>OTHER IDENTIFIED PROJECTS</u></b> |              |           |           |              |           |           |              |           |           |             |             |             |             |             |             |       |
| <b><u>Hvatt Regency Waikoloa</u></b>    |              |           |           |              |           |           |              |           |           |             |             |             |             |             |             |       |
| Hotel Units                             | 1260         | 0         | 0         | 0            | 0         | 0         | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 1260        | 0           | 1260  |
| Condominium                             | 0            | 0         | 0         | 0            | 0         | 0         | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Single-Family                           | 0            | 0         | 0         | 0            | 0         | 0         | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| <b><u>Ritz-Carlton</u></b>              |              |           |           |              |           |           |              |           |           |             |             |             |             |             |             |       |
| Hotel Units                             | 0            | 0         | 450       | 0            | 0         | 0         | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 450         | 200         | 650   |
| Condominium                             | 0            | 0         | 0         | 0            | 0         | 0         | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Single-Family                           | 0            | 0         | 0         | 0            | 0         | 0         | 0            | 0         | 0         | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| <b><u>ASSUMED OTHER PROJECTS</u></b>    |              |           |           |              |           |           |              |           |           |             |             |             |             |             |             |       |
| Hotel Units                             | 0            | 0         | 0         | 500          | 0         | 0         | 440          | 440       | 440       | 440         | 440         | 500         | 2000        | 500         | 2000        | 2500  |
| Condominium                             | 0            | 0         | 0         | 0            | 0         | 0         | 280          | 280       | 280       | 280         | 280         | 0           | 1400        | 0           | 1400        | 1400  |
| Single-Family                           | 0            | 0         | 0         | 0            | 0         | 0         | 30           | 30        | 30        | 30          | 35          | 0           | 155         | 0           | 155         | 155   |
| <b><u>TOTAL</u></b>                     |              |           |           |              |           |           |              |           |           |             |             |             |             |             |             |       |
| Hotel Units                             | 1260         | 0         | 450       | 500          | 0         | 350       | 440          | 440       | 440       | 440         | 440         | 2560        | 2200        | 2560        | 2200        | 4760  |
| Condominium                             | 0            | 0         | 0         | 0            | 0         | 0         | 370          | 370       | 370       | 370         | 370         | 0           | 1850        | 0           | 1850        | 1850  |
| Single-Family                           | 0            | 0         | 0         | 0            | 0         | 15        | 50           | 50        | 50        | 50          | 50          | 15          | 250         | 15          | 250         | 265   |

\* Note: Opening date schedules are relatively more fixed for 1988-93, whereas the schedule for 1994-1998 is more theoretical, based on CRI interpretation of official State forecasts.

TABLE V-6

Assumptions About Resort Unit Use,  
Occupancy, Party Size, and Employment Multipliers

|                                                                                        | <u>Hotel</u> | <u>Condominium</u> | <u>Single-Family</u> |
|----------------------------------------------------------------------------------------|--------------|--------------------|----------------------|
| PERCENT OF UNITS<br>IN VISITOR USE                                                     | 100%         | 50%                | 15%                  |
| Occupancy Rate                                                                         | 70%          | 50%                | 25%                  |
| Average Party Size                                                                     | 1.9          | 2.1                | 2.5                  |
| On-Site FTE Jobs/Unit*                                                                 |              |                    |                      |
| --Other Luxury Units                                                                   | 1.4          | 0.5                | 0.5                  |
| --Non-Luxury Units                                                                     | 1.0          | 0.4                | 0.5                  |
| Overall Luxury Adjustment<br>Factor (jobs/unit,<br>applicable to luxury<br>units only) | 0.35         | N/A                | N/A                  |
| PERCENT OF UNITS IN PART-<br>TIME RESIDENT USE                                         | 0.0%         | 25%                | 35%                  |
| Occupancy Rate                                                                         | 0.0%         | 25%                | 25%                  |
| Average Party Size                                                                     | 0.0          | 2.0                | 2.5                  |
| On-Site FTE Jobs/Unit                                                                  | 0.0          | 0.2                | 0.2                  |
| PERCENT OF UNITS IN FULL-<br>TIME RESIDENT USE                                         | 0.0%         | 25%                | 50%                  |
| Occupancy Rate                                                                         | 0.0%         | 95%                | 95%                  |
| Average Party Size                                                                     | 0.0          | 2.0                | 2.5                  |
| On-Site FTE Jobs/Unit                                                                  | 0.0          | 0.3                | 0.3                  |

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\* For use in estimating on-site employment when no other information is available.

Table V-7:

Example of Procedures for Calculating On-Site Population

(Example of total South Kohala Resort units expected to be completed in 1993, including 350 hotel and 15 single-family units)

| [Source:]                           | Units<br>[A: calculated from assumptions in Table V-6] | Party Size<br>[B: from Table V-6] | Peak Population Capacity<br>[C: equals A x B] | Average Occupancy<br>[D: from Table V-6] | Average Population<br>[E: equals A x B x D] |
|-------------------------------------|--------------------------------------------------------|-----------------------------------|-----------------------------------------------|------------------------------------------|---------------------------------------------|
| <b>RESORT RESIDENTS</b>             |                                                        |                                   |                                               |                                          |                                             |
| Condominiums, Part-Time Use         | 0                                                      | 2.0                               | 0                                             | 25%                                      | 0                                           |
| Condominiums, Full-Time Use         | 0                                                      | 2.0                               | 0                                             | 95%                                      | 0                                           |
| Single-Family House, Part-Time Use  | 5                                                      | 2.5                               | 13                                            | 25%                                      | 3                                           |
| Single-Family House, Full-Time Use  | 8                                                      | 2.5                               | 20                                            | 95%                                      | 18                                          |
| <b>DAILY VISITORS</b>               |                                                        |                                   |                                               |                                          |                                             |
| Hotel Rooms                         | 350                                                    | 1.9                               | 665                                           | 70%                                      | 466                                         |
| Condominiums, Visitor Use           | 0                                                      | 2.1                               | 0                                             | 50%                                      | 0                                           |
| Single-Family House, Visitor Use    | 2                                                      | 2.5                               | 5                                             | 25%                                      | 1                                           |
| <b>TOTAL VISITORS AND RESIDENTS</b> |                                                        |                                   | <b>691*</b>                                   |                                          | <b>488</b>                                  |

Weighted Averages:\*\* 1.9 69.7%

Adjusted Islandwide Employment Multiplier  $1.75 \times (69.7\%/65.0\%) \times (1.90/1.95) = 1.83^{**}$

\* Resident population based only on average, since fluctuations would be minor. "Peak Total" thus is sum of peak visitor population plus standard resort resident population.

\*\* Information calculated at this stage for later use in estimating islandwide employment impacts. (Note: DAHI recommends a multiplier of 1.75, but only when occupancy is 65.0% and average party size is 1.95. Otherwise, the indicated adjustments are required.)



Table V-8:

Projected On-Site Population

|                   | Year                                            |                            |                                                             |                                     | Total<br>1988-<br>1993<br>[incl.<br>S. Kohala<br>Resort] |
|-------------------|-------------------------------------------------|----------------------------|-------------------------------------------------------------|-------------------------------------|----------------------------------------------------------|
|                   | 1988-<br>1989<br>[Hyatt<br>Regency<br>Waikoloa] | 1990<br>[Ritz-<br>Carlton] | 1991<br>[500-unit<br>"Hotel X,"<br>unspecified<br>location] | 1993<br>[South<br>Kohala<br>Resort] |                                                          |
| Resort Residents: | 0                                               | 0                          | 0                                                           | 21                                  | 21                                                       |
| Daily Visitors    | 1676<br>2394                                    | 599<br>855                 | 665<br>950                                                  | 467<br>671                          | 3407<br>4870                                             |
| Total             | 1676<br>2394                                    | 599<br>855                 | 665<br>950                                                  | 488<br>691                          | 3428<br>4890                                             |
| avg.:<br>peak:    |                                                 |                            |                                                             |                                     |                                                          |

|                   | Year                      |                 |                           |                 |                           |                 | Cumulative<br>Total<br>1988-1998 |
|-------------------|---------------------------|-----------------|---------------------------|-----------------|---------------------------|-----------------|----------------------------------|
|                   | 1994<br>[South<br>Kohala] | 1994<br>[Other] | 1995<br>[South<br>Kohala] | 1995<br>[Other] | 1996<br>[South<br>Kohala] | 1996<br>[Other] |                                  |
| Resort Residents: | 82                        | 210             | 82                        | 210             | 82                        | 210             | 1481                             |
| Daily Visitors    | 49<br>102                 | 735<br>1141     | 49<br>102                 | 735<br>1141     | 49<br>102                 | 735<br>1141     | 7061<br>10705                    |
| Total             | 131<br>184                | 945<br>1351     | 131<br>184                | 945<br>1351     | 131<br>184                | 945<br>1351     | 8542<br>12186                    |
| avg.:<br>peak:    |                           |                 |                           |                 |                           |                 |                                  |

|                                           | South Kohala<br>1990-1998 | Other<br>1988-1998 |
|-------------------------------------------|---------------------------|--------------------|
| Total 1994-1998 incl. South Kohala Resort | 1460                      | 1057               |
| Daily Visitors                            | 3654<br>5835              | 6349<br>9526       |
| Total                                     | 5114<br>7295              | 7406<br>10583      |
| avg.:<br>peak:                            |                           |                    |

Results for South Kohala Resort: It is anticipated that about 20 permanent residents will be located at the South Kohala Resort in 1993. An estimated additional 80 residents are projected to move into the resort during each year from 1994 to 1997, and 75 during 1998. The estimated permanent population by 1998 is about 425 residents. The average daily visitor census in 1993 is expected to be approximately 465 guests, with peak capacity of about 670 should occupancy ever reach 100 percent. By 1998, the average daily visitor count would rise to approximately 710, with a peak capacity of about 1,180 guests. Thus, total 1998 South Kohala Resort population -- including both visitors and residents -- is estimated to average about 1,100 and reach theoretical occasional peaks of about 1,600.

(NOTE: The assumed build-out schedule for all South Kohala Resort multi- and single-family units, as shown in Table V-5, anticipates project completion by 1998. Actual completion date, of course, cannot be predicted at this time. Thus, the predicted average 1,100 and peak 1,600 population is actually for the project build-out date, whenever that may ultimately be.)

Cumulative Results: For all new West Hawaii resort units assumed to open by 1993, the average population on any one day would total about 3,400 additional people (roughly 0.6 percent of whom would be permanent resort residents), and the peak capacity would total some 4,900 people if visitor units should reach 100 percent occupancy levels. Extending the timeframe to 1998 -- including the very heavy resort development scenario implied by the official State forecasts -- the average daily on-site population would total about 8,500 additional people (17 percent of them permanent residents) and peak population capacity would be approximately 12,200 people.

### 1.2.3 Employment Impacts

Resort development generates both short-term jobs (during the construction phase) and permanent jobs (during the operational phase). In addition to on-site direct jobs, employment is also generated when resorts purchase goods or services from other businesses ("indirect" employment) and when employees spend their wages in the local economy ("induced" employment). Visitors also generate some "off-site direct" jobs when they spend money off the resort grounds (e.g., ground or air transportation, tours, purchases from roadside vendors, etc.). For construction, "off-site direct" jobs might include contractors' administrative personnel in company headquarters.

The DAHI approach ignores some of these distinctions, focusing only on islandwide total employment. However, in order to estimate how much of the islandwide employment will be located in the West Hawaii "Study Area," CRI retains some of the distinctions in employment categories for construction jobs.

#### 1.2.3.1 Construction Period

Using the example of the initial South Kohala Resort units to be completed in 1993 (i.e., 350 hotel and 15 single-family units), Table V-9 shows the assumptions and methodology -- generally based on the County's requested DAHI approach -- which are utilized to calculate construction jobs. Table V-10 shows complete results, for both the South Kohala Resort and the cumulative West Hawaii resort development scenario.

TABLE V-9

Example of Procedures for Calculating  
Total Construction Employment

South Kohala Resort Units Completed in 1993

| <u>A. Total Direct Statewide Employment</u>                                                         | <u>Units</u>      | <u>Multi-plier(1)</u> | <u>Total Direct Jobs(2)</u> |                    |
|-----------------------------------------------------------------------------------------------------|-------------------|-----------------------|-----------------------------|--------------------|
| Hotel Units                                                                                         |                   |                       |                             |                    |
| --Luxury                                                                                            | 350               | 1.35                  | 236                         |                    |
| --Non-Luxury                                                                                        | 0                 | 1.00                  | 0                           |                    |
| Condominium Units                                                                                   |                   |                       |                             |                    |
| --Luxury                                                                                            | 0                 | 1.62                  | 0                           |                    |
| --Non-Luxury                                                                                        | 0                 | 1.20                  | 0                           |                    |
| Single-Family Units                                                                                 |                   |                       |                             |                    |
| --Luxury                                                                                            | 5                 | 2.70                  | 14                          |                    |
| --Non-Luxury                                                                                        | 10                | 2.00                  | 20                          |                    |
| --Infrastructure (7% of all direct jobs to 1998, divided by 5 for 1988-93 construction period only) |                   |                       | 27                          |                    |
| <br>                                                                                                |                   |                       |                             |                    |
| <u>B. Allocation by Area</u>                                                                        | <u>Study Area</u> | <u>Rest of Island</u> | <u>BIG ISLAND SUBTOTAL</u>  | <u>STATE TOTAL</u> |
| <u>Direct:</u>                                                                                      |                   |                       |                             |                    |
| On-Site                                                                                             | 243 (3)           | 0                     | 243                         | 243                |
| Off-Site                                                                                            | 15 (5)            | 15                    | 30                          | 60                 |
| (SUBTOTAL)                                                                                          | 258               | 15                    | 273 (4)                     | 303                |
| <u>Indirect/Induced</u>                                                                             | 135 (7)           | 43                    | 178 (6)                     | N/A (8)            |
| TOTAL                                                                                               | 393               | 58                    | 451                         | N/A                |

- (1) Employment multipliers for non-luxury units are from DAHI (1986). CRI produced the adjusted luxury multipliers in a parallel manner to DAHI's 0.35 "luxury adjustment factor" for operational jobs. See Table 2.13.
- (2) Statewide direct jobs calculated by multiplying the number of units by the employment multiplier, then dividing by the number of years for construction to be completed (2 years assumed for hotel, and 1 year for condo and SF units).
- (3) Assumes 80 percent of statewide direct jobs to be on-site.
- (4) Assumes 90 percent of statewide direct jobs to be on-island.
- (5) Assumes 50 percent of off-site direct jobs to be located in Study Area, with the remainder located in rest of island.
- (6) Islandwide indirect/induced jobs assumed to be total islandwide direct jobs multiplied by 0.65. The 0.65 multiplier for on-island indirect/induced employment is from the DAHI methodology.
- (7) Assumes 75 percent of indirect/induced jobs to be located in Study Area, with the remainder located in rest of island.
- (8) The DAHI methodology did not provide a multiplier for calculating indirect/induced jobs on a statewide level.

Table V-10:

Average Daily Resort Construction Employment -- 1988 to 1998  
(All Numbers Represent Full-Time Equivalent Positions)

|                            | Year or Period* |               |               |               |               |               |               |               |               |               |               |               |
|----------------------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                            | 7/87-<br>6/88   | 7/88<br>12/88 | 1/89-<br>6/89 | 7/89-<br>6/90 | 7/90-<br>6/91 | 7/91-<br>6/92 | 7/92-<br>6/93 | 7/93-<br>6/94 | 7/94-<br>6/95 | 7/95-<br>6/96 | 7/96-<br>6/97 | 7/97-<br>6/98 |
| <u>SOUTH KOHALA RESORT</u> |                 |               |               |               |               |               |               |               |               |               |               |               |
| On-Site                    | 0               | 27            | 27            | 27            | 74            | 263           | 243           | 130           | 118           | 118           | 118           | 110           |
| Rest of Study Area         | 0               | 18            | 18            | 18            | 49            | 165           | 149           | 79            | 72            | 72            | 72            | 68            |
| STUDY AREA SUBTOTAL        | 0               | 45            | 45            | 45            | 123           | 428           | 393           | 209           | 191           | 191           | 191           | 178           |
| Rest of Island             | 0               | 5             | 5             | 5             | 13            | 59            | 58            | 32            | 29            | 29            | 29            | 27            |
| ISLAND TOTAL               | 0               | 50            | 50            | 50            | 136           | 487           | 451           | 240           | 220           | 220           | 220           | 205           |
| <u>ALL OTHER PROJECTS</u>  |                 |               |               |               |               |               |               |               |               |               |               |               |
| On-Site                    | 627             | 870           | 243           | 513           | 270           | 0             | 255           | 905           | 785           | 905           | 749           | 691           |
| Rest of Study Area         | 383             | 531           | 148           | 313           | 165           | 0             | 156           | 553           | 480           | 553           | 458           | 304           |
| STUDY AREA SUBTOTAL        | 1010            | 1401          | 391           | 826           | 435           | 0             | 412           | 1457          | 1265          | 1457          | 1207          | 995           |
| Rest of Island             | 154             | 214           | 60            | 126           | 66            | 0             | 63            | 222           | 209           | 222           | 184           | 170           |
| ISLAND TOTAL               | 1164            | 1615          | 451           | 952           | 501           | 0             | 474           | 1679          | 1474          | 1679          | 1391          | 1164          |
| <u>CUMULATIVE TOTALS</u>   |                 |               |               |               |               |               |               |               |               |               |               |               |
| On-Site                    | 627             | 897           | 270           | 540           | 344           | 263           | 498           | 1035          | 903           | 1023          | 867           | 801           |
| Rest of Study Area         | 383             | 549           | 166           | 331           | 214           | 165           | 305           | 632           | 552           | 625           | 530           | 372           |
| STUDY AREA SUBTOTAL        | 1010            | 1446          | 436           | 871           | 558           | 428           | 805           | 1666          | 1455          | 1648          | 1397          | 1173          |
| Rest of Island             | 154             | 219           | 65            | 131           | 79            | 59            | 121           | 254           | 238           | 251           | 213           | 197           |
| ISLAND TOTAL               | 1164            | 1665          | 501           | 1002          | 637           | 487           | 925           | 1919          | 1694          | 1899          | 1610          | 1370          |

\* Note: Each year or time period begins on the first of July, and ends at the end of the following June. The only exception is the 1988-1989 period, which is separated into two six-month periods. This was done in order to distinguish the last six months of construction at the Hyatt Waikoloa (estimated completion date at the end of 1988) from other ongoing projects during the 1988-1989 timeframe.

Results for the South Kohala Resort: During the two-year period from 1988 to 1990, infrastructure construction would generate an average daily employment of about 50 Big Island workers, with an estimated 27 to be located on-site. During the next year, average daily construction employment figures would increase to 136 and 74, respectively, as construction of the golf course, clubhouse, and beach and tennis clubs begins. Hotel construction starting in the last half of 1991 would increase the number of on-site workers to 263, with a total island figure of 487. The number of construction workers would decline slightly the following year with 243 workers expected on-site, another 150 elsewhere in the West Hawaii Study Area, and 58 elsewhere on the island, for a Big Island total of about 451.

During the second five-year period from 1993 to 1998, construction of single and multi-family units is expected to generate on-site employment ranging from 110 to 130 workers per year. Total islandwide employment would range from 205 to 240 workers per year.

Cumulative Results: Cumulative construction employment numbers depend on assumptions about how many units will be built and in which timeframes. Thus, results of Table V-10 are directly dependent on the assumptions of Table V-5. Given these assumptions, Table V-10 indicates considerable variation in construction employment through 1993 (which reflects historic "busts" and "booms" in the construction industry), but sustained high numbers of construction jobs from 1994 to 1998.

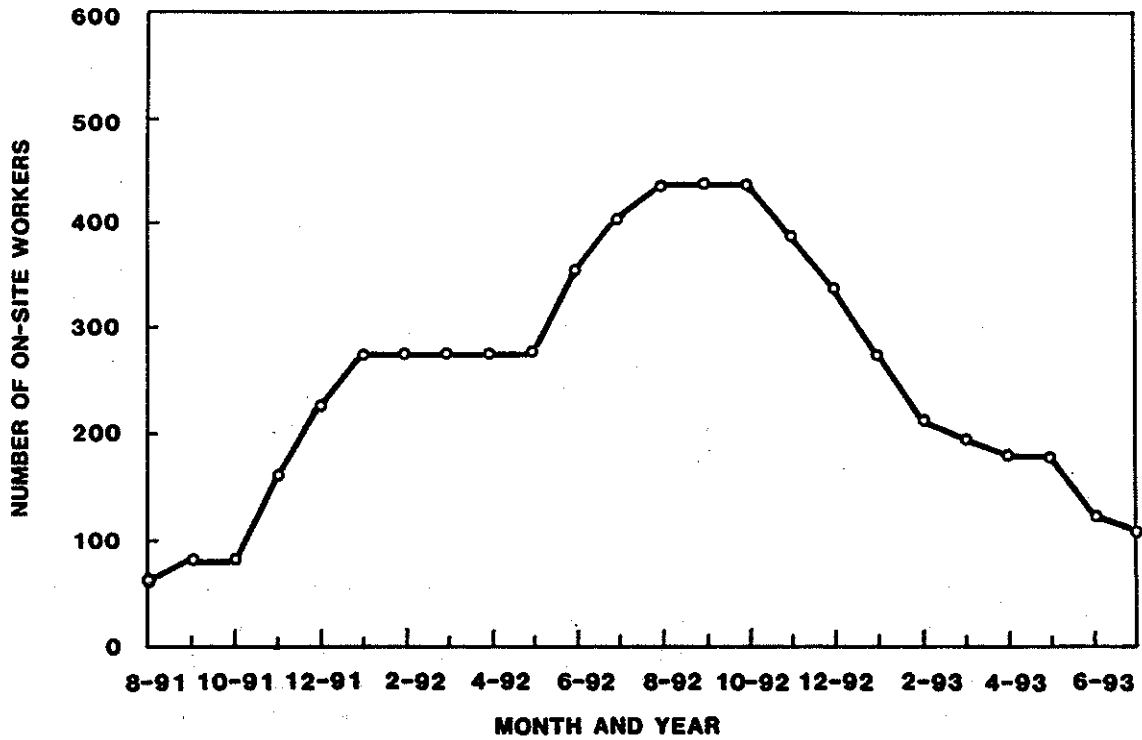
Table V-10 reports average job figures. In reality, on-site employment for any project reaches a peak in the middle part of the construction timeframe, and there are fewer workers required in the early and later stages. Based on actual data from construction of the Mauna Lani Bay Hotel (Mauna Lani Resort, Inc., 1980), CRI modeled separate "construction job curves" for the South Kohala Resort and a hypothetical 1994 hotel. Figure V-1(a) shows the expected curve of the number of on-site workers for the South Kohala Resort from August 1991 to the end of the construction period in 1993. Figure V-1(b) shows the results obtained by superimposing the South Kohala Resort along with the hypothetical 1994 hotel during the same timeframe.

Figure V-1(a) shows that on-site construction at the South Kohala Resort would be expected to peak during the months of August to October in 1992, when about 435 workers would be located on-site. During following months, the numbers of workers on-site would steadily decline. With the addition of a hypothetical hotel which would complete construction in 1994, a higher level of on-site workers (ranging from 450 to 570) in the Kohala area would be maintained.

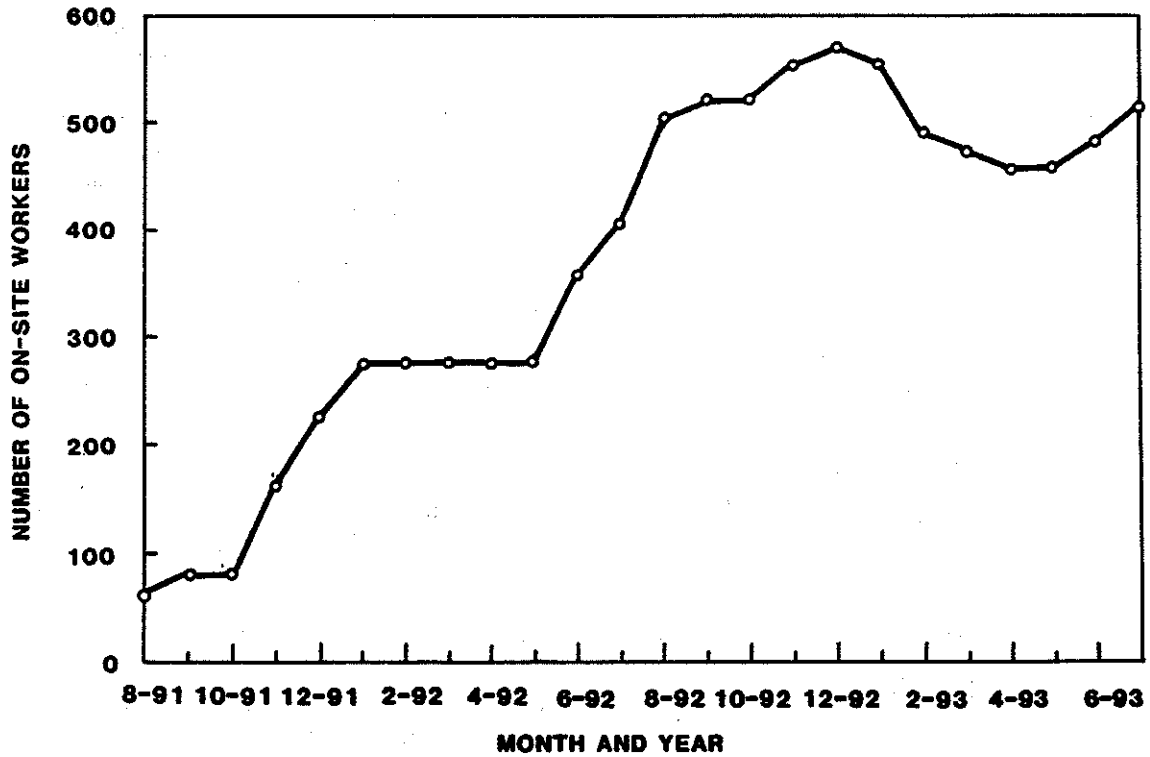
#### 1.2.3.2 Operational Period

Number of On-Site Resort Jobs: Table V-11 shows the projected number of new and cumulative on-site jobs for the South Kohala Resort between 1993 and 1998. The table also provides an example, using new hotel and single-family units expected to come on-line in 1993, to explain the methodology for calculating these jobs. The majority of new jobs will begin in 1993, when the hotel opens. The hotel is expected to provide 490 full-time equivalent (FTE) positions. An additional four jobs during the same year will be generated by the construction of 15 single-family units. The construction of single-

**A. SOUTH KOHALA RESORT**



**B. SOUTH KOHALA RESORT AND 1994 WEST HAWAII HOTEL**



**Figure V-1  
ON-SITE CONSTRUCTION WORKERS**

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

TABLE V-11

## On-Site Operational Employment\*

| Type of Unit             | Opening Year |      |      |      |      |      |
|--------------------------|--------------|------|------|------|------|------|
|                          | 1993         | 1994 | 1995 | 1996 | 1997 | 1998 |
| FROM HOTEL UNITS         | 490          | 0    | 0    | 0    | 0    | 0    |
| FROM CONDOMINIUM UNITS   |              |      |      |      |      |      |
| --Visitor use            | 0            | 22   | 22   | 22   | 22   | 22   |
| --Part-time resident use | 0            | 5    | 5    | 5    | 5    | 5    |
| --Full-time resident use | 0            | 7    | 7    | 7    | 7    | 7    |
| Subtotal                 | 0            | 34   | 34   | 34   | 34   | 34   |
| FROM SINGLE-FAMILY UNITS |              |      |      |      |      |      |
| --Visitor use            | 1            | 2    | 2    | 2    | 2    | 1    |
| --Part-time resident use | 1            | 1    | 1    | 1    | 1    | 1    |
| --Full-time resident use | 2            | 3    | 3    | 3    | 3    | 2    |
| Subtotal                 | 4            | 6    | 6    | 6    | 6    | 4    |
| TOTAL NEW JOBS EACH YEAR | 494          | 40   | 40   | 40   | 40   | 38   |
| CUMULATIVE ON-SITE JOBS  | 494          | 534  | 574  | 614  | 654  | 692  |

\* Jobs expressed as FTE (full-time equivalent), based on assumptions and multipliers in Table V-6, as applied to South Kohala Resort units counts in Table V-5.

Example for 1993

|                        | <u>Total</u> | <u>Visitor Use</u> | <u>Part-Time Res. Use</u> | <u>Full-Time Res. Use</u> |
|------------------------|--------------|--------------------|---------------------------|---------------------------|
| Hotel Units            | 350          | 350 (100%)         | 0                         | 0                         |
| FTE Multiplier         | ---          | 1.4                | 0                         | 0                         |
| Jobs                   | 490          | 490                | 0                         | 0                         |
| Single-Family Units    | 15           | 2 (15%)            | 5 (35%)                   | 8 (50%)                   |
| FTE Multiplier         | ---          | 0.5                | 0.2                       | 0.3                       |
| Jobs                   | 4            | 1                  | 1                         | 2                         |
| Multi-Family Units     | 0            | 0 (50%)            | 0 (25%)                   | 0 (25%)                   |
| FTE Multiplier         | ---          | 0.5                | 0.2                       | 0.3                       |
| Jobs                   | 0            | 0                  | 0                         | 0                         |
| TOTAL FTE JOBS IN 1993 | 494          |                    |                           |                           |

family and condominium units during subsequent years is projected to add an additional 40 FTE on-site jobs from 1994 to 1997, and 38 jobs in 1998. The cumulative total FTE on-site jobs at South Kohala Resort by 1998 (or whenever build-out actually occurs) is expected to reach 692.

To provide some indication of the likely nature of the jobs, Table V-12 reproduces information provided by the Westin Mauna Kea which shows the hotel's existing staff by department. The majority of jobs are in the Food and Beverage (food servers, bus people, etc.), Kitchen, and Housekeeping departments. About 80 percent of all positions are full-time.

It must be noted that the Westin Mauna Kea has the highest staffing ratio of any hotel in the state. This is largely the result of the level of service that is provided by the luxury-class resort. However, another factor which adds to the total number employees is the high proportion of persons who have been employed at the hotel for an extended number of years. This requires more workers to cover for those who have earned longer vacation time (personal communication, Elaine Hokama, Human Resources Administrator, Westin Mauna Kea Hotel, June 2, 1987). Should many long-time Westin Mauna Kea workers transfer to the new hotel, the Westin's staffing ratio may drop slightly, and the proportion of full-time workers would increase.

The South Kohala Resort is also intended to be a luxury-class resort, although the hotel staffing ratio is expected to be lower than at the Westin Mauna Kea. Figures shown in Table V-12 may be used as a guideline for determining the expected proportional breakdown by department when operations begin at the Resort.

Wages/Salaries for On-Site Employees: Exact wages for hotel staff depend to a large extent on results of union elections and collective bargaining agreements. However, to provide some indication, the Westin Mauna Kea Hotel has shared payroll data on employee wages as of 1986. As shown in Table V-13, the median income for union workers was about \$15,100 per year, while the majority of salaried workers (both management and office support) earned \$21,000 or more. These figures exclude fringes and tips, the amount and value of which are often a source of debate.

More subjective issues surrounding resort wages and working conditions -- such as adequacy of pay and worker satisfaction -- will be discussed in later sections.

Number of Jobs Islandwide and in Study Area from South Kohala Resort Development: Again using the example of the initial 1993 South Kohala Resort units, Table V-14 shows the assumptions and methodology -- based on the County's requested DAHI approach -- used to calculate new islandwide jobs generated by West Hawaii resort construction. Overall results are contained in Table V-15.

A few things should be noted about the DAHI methodology. First, it provides only islandwide, not statewide, employment totals. The islandwide totals are not always compatible with statewide totals based on standard multipliers developed by the Hawaii State Department of Planning and Economic Development, and so no statewide figures are reported here. Second, an unpublished feature of the DAHI approach involves a "luxury adjustment



TABLE V-12

## Existing Staff at the Westin Mauna Kea Beach Hotel and Golf Course

| Department                        | Number of Positions |                      |       |
|-----------------------------------|---------------------|----------------------|-------|
|                                   | Full-Time           | Part-Time/<br>Casual | Total |
| Food and Beverage (servers, etc.) | 97                  | 82                   | 179   |
| Kitchen                           | 115                 | 14                   | 129   |
| Housekeeping                      | 97                  | 11                   | 108   |
| Grounds -- Maintenance            | 49                  | 5                    | 54    |
| Shops -- Retail                   | 36                  | 6                    | 42    |
| Beverage (bar workers)            | 21                  | 19                   | 40    |
| Front Office                      | 35                  | 4                    | 39    |
| Engineering                       | 36                  | 3                    | 39    |
| Accounting & Purchasing           | 32                  | 4                    | 36    |
| Grounds -- Golf Course            | 20                  | 1                    | 21    |
| United Airlines Inflight Catering | 13                  | 1                    | 14    |
| Beach & Pool                      | 12                  | 1                    | 13    |
| Golf Pro Shop                     | 12                  | 0                    | 12    |
| Laundry                           | 8                   | 1                    | 9     |
| Catamaran                         | 7                   | 2                    | 9     |
| Banquets                          | 2                   | 6                    | 8     |
| Sales                             | 7                   | 0                    | 7     |
| Executive Offices                 | 6                   | 0                    | 6     |
| PBX                               | 5                   | 0                    | 5     |
| Human Resources                   | 4                   | 0                    | 4     |
| Beauty Salon                      | 2                   | 1                    | 3     |
| Conference Services               | 3                   | 0                    | 3     |
| Activities Desk                   | 2                   | 0                    | 2     |
| Data Processing                   | 2                   | 0                    | 2     |
| Property Services                 | 2                   | 0                    | 2     |
| Tennis                            | 2                   | 0                    | 2     |
| Clinic                            | 1                   | 0                    | 1     |
| Stables                           | 1                   | 0                    | 1     |
| TOTALS:                           | 629                 | 161                  | 790   |

NOTE: The above jobs include salaried and hourly wage earners. A more detailed breakdown of positions supplied by the Westin Mauna Kea suggests approximately 13 percent of all jobs are at the management/supervisory level.

Source: Westin Mauna Kea Hotel.

TABLE V-13

## Wage/Income Distribution for Westin Mauna Kea Employees, 1986

|                               | Union Workers |               |                    | Salaried Workers   |               |          |
|-------------------------------|---------------|---------------|--------------------|--------------------|---------------|----------|
|                               | Full-<br>Time | Part-<br>Time | Casual             | Full-<br>Time      | Part-<br>Time | Casual   |
| \$ 7,680 or less              | 14            | 13            | 21                 | 0                  | 0             | 0        |
| \$ 7,681 - \$ 9,600           | 10            | 11            | 6                  | 0                  | 0             | 0        |
| \$ 9,601 - \$11,520           | 20            | 7             | 7                  | 0                  | 0             | 0        |
| \$11,521 - \$13,340           | 58            | 7             | 4                  | 0                  | 0             | 0        |
| \$13,241 - \$15,360           | 135           | 8             | 2                  | 0                  | 0             | 0        |
| \$15,361 - \$17,280           | 67            | 1             | 0                  | 2                  | 0             | 0        |
| \$17,281 - \$19,200           | 53            | 0             | 0                  | 8                  | 0             | 0        |
| \$19,201 - \$21,120           | 32            | 3             | 0                  | 20                 | 0             | 0        |
| \$21,121 or more              | <u>57</u>     | <u>1</u>      | <u>0</u>           | <u>45</u>          | <u>0</u>      | <u>0</u> |
|                               | 446           | 51            | 40                 | 75                 | 0             | 0        |
| APPROXIMATE<br>MEDIAN INCOME: | \$15,141      | \$10,012      | (under<br>\$7,680) | (over<br>\$21,121) | N/A           | N/A      |

Notes:

- (1) Income before taxes and exclusive of fringes or tips. Fringe benefits are about 29 percent of salary.
- (2) Includes only those employees remaining on payroll from December 16, 1986 through December 15, 1987 -- i.e., excludes people who worked for only part of a year. Thus, total numbers do not completely reflect Mauna Lani's staffing pattern, since turnover is less frequent among salaried workers.
- (3) "Median" refers to the figure in the middle, with 50 percent of employees earning more and 50 percent earning less.
- (4) Income figures reflect earnings of individual workers, not entire households.

Source: Mr. Lindberg Valentin, Director of Personnel, Westin Mauna Kea Hotel, April 1987.

TABLE V-14

Example of Procedures for Calculating Total Operational Employment

South Kohala Resort Units in 1993

| <u>A. Total On-Island Employment</u> | <u>Units/<br/>People</u> | <u>Multi-<br/>plier (1)</u> | <u>Jobs</u> |
|--------------------------------------|--------------------------|-----------------------------|-------------|
| Basic Units (Tourist Use Only)       | 352                      | 1.83                        | 645         |
| Luxury Hotel Unit Adjustment         | 350                      | 0.35                        | 123         |
| No. of Resort Residents              | 21                       | 0.29                        | <u>6</u>    |
| TOTAL                                |                          |                             | 774         |

| <u>B. Allocation by Area</u> | <u>Study<br/>Area</u> | <u>Rest of<br/>Island</u> | <u>Island<br/>Total</u> |
|------------------------------|-----------------------|---------------------------|-------------------------|
| On-Site                      | 494 (2)               | 0                         | 494                     |
| Off-Site                     | <u>224 (3)</u>        | <u>56</u>                 | <u>281</u>              |
| TOTAL                        | 718                   | 56                        | 774                     |

(1) First multiplier calculated by procedure shown in Table V-7. Second multiplier from Table V-6. Third multiplier from DAHI (1986).

(2) On-site employment calculated from procedures in Table V-6.

(3) Assumes 80% of off-site employment in Study Area.

Table V-15:

New Resort Operational Employment -- 1988 to 1998  
(All Numbers Represent Full-Time Equivalent Positions)

|                            | Opening Year     |      |      |      |      |      |      |      | Sub- |      | Total |               |               |
|----------------------------|------------------|------|------|------|------|------|------|------|------|------|-------|---------------|---------------|
|                            | 1988-<br>1989(1) | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |       | 1988-<br>1993 | 1994-<br>1998 |
| <u>SOUTH KOHALA RESORT</u> |                  |      |      |      |      |      |      |      |      |      |       |               |               |
| On-Site (2)                | 0                | 0    | 0    | 0    | 494  | 40   | 40   | 40   | 40   | 38   | 494   | 198           | 692           |
| Rest of Study Area         | 0                | 0    | 0    | 0    | 224  | 42   | 42   | 42   | 42   | 41   | 224   | 209           | 433           |
| STUDY AREA SUBTOTAL        | 0                | 0    | 0    | 0    | 718  | 82   | 82   | 82   | 82   | 79   | 718   | 407           | 1125          |
| Rest of Island             | 0                | 0    | 0    | 0    | 56   | 10   | 10   | 10   | 10   | 10   | 56    | 50            | 106           |
| ISLAND TOTAL               | 0                | 0    | 0    | 0    | 774  | 92   | 92   | 92   | 92   | 89   | 774   | 457           | 1231          |
| <u>ALL OTHER PROJECTS</u>  |                  |      |      |      |      |      |      |      |      |      |       |               |               |
| On-Site (2)                | 1700             | 678  | 700  | 0    | 0    | 730  | 530  | 730  | 530  | 451  | 3078  | 2971          | 6049          |
| Rest of Study Area         | 844              | 245  | 315  | 0    | 0    | 405  | 442  | 405  | 442  | 279  | 1404  | 1973          | 3377          |
| STUDY AREA SUBTOTAL        | 2544             | 923  | 1015 | 0    | 0    | 1135 | 972  | 1135 | 972  | 730  | 4482  | 4944          | 9426          |
| Rest of Island             | 211              | 61   | 78   | 0    | 0    | 118  | 127  | 118  | 127  | 90   | 350   | 580           | 930           |
| ISLAND TOTAL               | 2755             | 984  | 1093 | 0    | 0    | 1253 | 1099 | 1253 | 1099 | 820  | 4832  | 5524          | 10356         |
| <u>COMBINED TOTALS</u>     |                  |      |      |      |      |      |      |      |      |      |       |               |               |
| On-Site                    | 1700             | 678  | 700  | 0    | 494  | 770  | 570  | 770  | 570  | 729  | 3572  | 3409          | 6981          |
| Rest of Study Area         | 844              | 245  | 315  | 0    | 224  | 447  | 484  | 447  | 484  | 478  | 1628  | 2311          | 3968          |
| STUDY AREA SUBTOTAL        | 2544             | 923  | 1015 | 0    | 718  | 1217 | 1054 | 1217 | 1054 | 1207 | 5200  | 5749          | 10949         |
| Rest of Island             | 211              | 61   | 78   | 0    | 56   | 128  | 137  | 128  | 137  | 139  | 406   | 664           | 1075          |
| ISLAND TOTAL               | 2755             | 984  | 1093 | 0    | 774  | 1345 | 1191 | 1345 | 1191 | 1346 | 5606  | 6418          | 12024         |

\* Note: Opening date schedules are relatively more fixed for 1988-1993, whereas the schedule for 1994-1998 is more theoretical, based on CRI interpretation of official State forecasts.

(1) Includes the Hyatt Regency Waikoloa.

(2) On-site figures for initial Ritz-Carlton 450 units and Hyatt Regency Waikoloa obtained from hotel sources; remainder calculated from assumptions in Table V-6.

factor" for hotels such as the South Kohala Resort; this has been calculated based on discussions with DAHI principal Dr. Bruce Plasch (personal communications, January 1987). These issues are discussed at more length in the Community Resources (1987) technical document.

As indicated in Tables V-14 and V-15, the initial South Kohala Resort units in 1993 are estimated to generate 774 FTE jobs throughout the Big Island. These include the 494 on-site jobs plus 280 additional jobs elsewhere on the island (including "off-site direct" jobs, "indirect" employment, and "induced" employment as defined in Section 1.2.3), of which 80 percent are estimated to be located in the Study Area. The 80 percent assumption is somewhat high, since much of the island's retail and light industrial support facilities are still located in East Hawaii, but it is assumed that more such facilities will gradually develop in West Hawaii as resorts continue to open there.

For years 1994 to 1997, Table V-15 shows an islandwide figure of about 92 new FTE jobs each year. Another 89 are estimated for 1998. Thus, for the total development at the South Kohala Resort, the number of islandwide jobs would be about 1,231 -- which breaks down into some 692 on-site, 433 elsewhere in West Hawaii, and 106 in East Hawaii.

Islandwide and Study Area Employment from Cumulative West Hawaii Resort Development: During the 1988-93 period, the assumed new West Hawaii resorts would generate about 5,600 new FTE jobs islandwide. Some 1,100 of these would come from the hypothetical "Hotel X," with the remainder from the three identified projects -- Ritz-Carlton Mauna Lani, Hyatt Regency Waikoloa, and the South Kohala Resort. The major source of new jobs during this period will be the Hyatt Regency Waikoloa, producing nearly half the total estimated number. For all new resorts, about three out of every eight jobs would be off-site, with most of these in West Hawaii.

For the 1994-98 period, during which actual development is much more speculative at this point, the assumed scenario produces an additional 1,200 to 1,300 jobs islandwide each year. Should this scenario actually materialize, the total number of new FTE jobs islandwide from new resorts opening between 1988 and 1998 would be about 12,000, nearly 11,000 of which are assumed to be located (eventually if not immediately) in the West Hawaii Study Area.

#### **1.2.4 Labor Demand Vs. Supply and Worker In-Migration**

If the demand for workers living in the Study Area exceeds supply, it will be necessary to import workers. This section contains CRI forecasts of labor demand vs. supply and consequent needed worker in-migration (above and beyond in-migration which is expected to be taking place anyway).

The focus in this section will be on in-migration related to permanent (operational) jobs. In-migration related to construction is usually temporary, and assumptions relating to this phenomenon will be discussed in the following Section 1.2.6.1 on Construction Housing Impacts. The focus is also restricted to the West Hawaii Study Area, since the lack of competing job prospects in East Hawaii reduces concern over labor supply there.

Historically, new Hawaii hotels obtain many of their initial employees from existing hotels, since current workers can often move up to better positions at new hotels. When a new hotel is managed by a chain which already runs at least one other hotel in the area (e.g., if the South Kohala Resort hotel were to be managed by Westin, a possibility which has not yet been decided upon), there is the added advantage of personnel department familiarity with the area and ability to tap family networks of existing employees.

Thus, there is a strong likelihood that the new South Kohala Resort hotel will have little difficulty finding workers. However, the County has pointed out that new hotel openings often displace any labor shortage problems to previously existing operations. The County therefore requested that analysis be focused on the issue of total West Hawaii labor supply, total labor demand, and consequent implications for in-migration.

CRI has developed several complex micro-computer models to predict levels of available West Hawaii labor supply and required in-migration. These are described in detail in that company's technical document submitted to the County (Community Resources, Inc., 1987). Several key assumptions and methods include the following:

- o It is assumed that construction workers do not represent "available labor" for resort operational employment. Based on 1970 Census figures, 15 percent of the total Study Area labor force is assumed to be involved in construction trades and excluded from following analyses.
- o It is also assumed that "full employment" will always exclude a certain portion of remaining workers who are between jobs even in the best of times -- three percent of on-island unemployed labor force participants, and ten percent of unemployed recent in-migrants.
- o The County's requirement for a cumulative impact assessment requires consideration of new non-resort, as well as new resort, labor demand in the West Hawaii Study Area. Table V-16 provides CRI estimates of non-resort worker demand through 1998.
- o "Available labor" will consist primarily of (1) new labor force entrants from natural population increase (estimated from an age-sex cohort projection technique, described in CRI's technical submission to the County), and also of (2) in-migrants who will be coming to West Hawaii regardless of economic conditions, although they will ultimately require jobs to remain (e.g., Asian immigrants joining families already in the area, young Mainland transients, "urban refugees" from Honolulu, etc.). The latter group is estimated at 80 percent of the new labor force entrants from natural increase -- considered a fairly conservative estimate in light of Hawaii State Department of Planning and Economic Development (1985, p. 11) estimates that Hawaii County population growth in the 1970's and early 1980's due to in-migration was 200 percent of the amount due to the balance of births over deaths.

(DEFINITIONAL NOTE: In-migrants expected to come to West Hawaii anyway, even before new jobs are available, will be referred to as "Non-Induced In-Migrants." This contrasts with "Induced In-Migrants," the people who must be imported to fill any labor shortages created after new jobs are made available.)

Table V-16:

Estimated New Jobs from Study Area Economic Activities Other than New Resorts

|                                           | July 1986 | July 1987 | July 1988 | July 1989 | July 1990 | July 1991 | July 1992 | July 1993 | July 1994 | July 1995 | July 1996 | July 1997 | July 1998 |
|-------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Increased Occupancy of Existing Units (1) | 1135      | 462       | 51        | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| HOST Park (2)                             | 0         | 0         | 0         | 0         | 145       | 145       | 145       | 145       | 145       | 145       | 145       | 145       | 145       |
| Coffee/Agriculture (3)                    | 0         | 0         | 25        | 25        | 25        | 25        | 25        | 25        | 25        | 25        | 25        | 25        | 25        |
| Other (4)                                 | 110       | 110       | 110       | 110       | 110       | 135       | 135       | 135       | 135       | 135       | 170       | 170       | 170       |
| TOTAL                                     | 1245      | 572       | 186       | 135       | 280       | 305       | 305       | 305       | 305       | 305       | 340       | 340       | 340       |

- (1) Figures derived by applying DAHI multipliers and treating increased occupancy as equivalent to new units. Assumes occupancies at existing units will plateau at 67.5 percent in 1987 and thereafter, with average party size plateauing at 1.90 in 1988 and thereafter.
- (2) Numbers reflect "Medium" Development Scenario from HOST Park EIS (Traverse Group, Inc., 1985, p. IV-52), assuming 20-year timeframe beginning in 1990. The 1990 start date for new jobs is based on estimates from HOST Park consultant Marilyn Metz (personal communication, March 27, 1987).
- (3) Assumptions by CRI reflecting recent improved market prospects for coffee.
- (4) Application of DAHI multiplier of 0.29 for induced jobs from new population not supported by regional economic activity. This is conservatively estimated as 25 percent of future new Study Area population, extrapolated from estimated 1980-1985 annualized growth rate of 4.69 percent.

- o Smaller sources of labor supply -- assumed to fill demand before it would be necessary to import any "Induced In-Migrants" -- would include (1) commuters from East Hawaii (constituting two percent of luxury Kohala hotel workers in the 1987 Employee Survey, a figure assumed to rise to a stable four percent by 1993 due to limited job growth prospects in East Hawaii), and (2) additional "moonlighting" by currently employed Study Area residents (assumed to account for possibly three percent of new jobs, based on the Employee Survey finding that nearly 50 percent of current workers desire additional employment). However, the CRI method allocates jobs to commuters and "moonlighters" only if labor demand exceeds other sources of on-island supply.

Table V-17 contains results of the CRI analysis for the future situation in which both projected new Study Area resort jobs and non-resort jobs are developed. Table V-18 shows the assumed distribution of new jobs and (since observed patterns of multiple jobholding indicate that required numbers of new workers will be slightly less than numbers of new jobs) of new workers.

While the exact numbers in these tables are highly dependent on foregoing assumptions, the basic principle is that more induced in-migration will be required in years when more new jobs open up, whether these jobs are due to resorts or other causes. If there is a period when few new jobs are being created, a surplus of available labor will build up, and little or no induced in-migration will be required.

According to the best information available as of this time, the 350-unit hotel at the South Kohala Resort will open roughly four and a half years after the Waikoloa Hyatt, and three years after the Ritz-Carlton Mauna Lani. The development scenario constructed for this impact analysis further assumes that a 500-unit "Hotel X" will be completed one year after the Ritz-Carlton in 1991. During the time from this project's completion to the opening of the South Kohala Resort, few other currently foreseeable jobs will become available. This is expected to allow for some surplus of available Study Area labor to begin developing. Nevertheless, Table V-18 shows that of the 1,023 new jobs projected for 1993, 36 percent would be filled by in-migrants to the Study Area. This would increase to 53 percent if "Non-Induced In-Migrants" are counted. Most of the remaining jobs (40 percent) would be filled with available labor on-island, with an additional small proportion going to commuters and moonlighters.

Under the scenario developed in Table V-5, the condominium and single-family units expected to come on-line at the South Kohala Resort between 1994 and 1998 will generate labor demand during a period when many other resort and non-resort activities are creating a demand for labor. Compared to the figures for 1993 discussed above, the percentage of new West Hawaii jobs expected to be filled by in-migrants during this timeframe will range from a low of 56 percent, to a high of 64 percent.

Looking at the overall timeframe in the context of cumulative West Hawaii resort development, the need for substantial in-migration is mostly suggested when the Waikoloa Hyatt opens in late 1988; when the assumed "Hotel X" opens in 1991; to a lesser extent, when the South Kohala Resort hotel opens in 1993; and in other years from 1994 to 1998, due to previously-explained assumptions about ongoing heavy resort development during this period.



Table V-17:

Labor Supply/Demand Analysis, 1988 - 1998  
[Excludes Construction Sector]

|                                                  | Opening Date |              |              |              |              |              |              |              |              |              | Sub-Totals   |               |               | Total<br>1988-<br>1998 |
|--------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|------------------------|
|                                                  | Dec.<br>1988 | July<br>1989 | July<br>1990 | July<br>1991 | July<br>1992 | July<br>1993 | July<br>1994 | July<br>1995 | July<br>1996 | July<br>1997 | July<br>1998 | 1988-<br>1993 | 1994-<br>1998 |                        |
| <b>Total New Study Area Jobs</b>                 |              |              |              |              |              |              |              |              |              |              |              |               |               |                        |
| Resort Projects                                  | 2544         | 0            | 923          | 1015         | 0            | 718          | 1217         | 1054         | 1217         | 1054         | 1207         | 5200          | 5749          | 110949                 |
| Non-Resort Projects                              | 68           | 68           | 280          | 305          | 305          | 305          | 305          | 305          | 340          | 340          | 340          | 1331          | 1630          | 2961                   |
| <b>STUDY AREA TOTAL</b>                          | <b>2612</b>  | <b>68</b>    | <b>1203</b>  | <b>1320</b>  | <b>305</b>   | <b>1023</b>  | <b>1522</b>  | <b>1359</b>  | <b>1557</b>  | <b>1394</b>  | <b>1547</b>  | <b>6531</b>   | <b>7379</b>   | <b>113910</b>          |
| <b>Demand for Workers</b>                        |              |              |              |              |              |              |              |              |              |              |              |               |               |                        |
| <b>New Workers Living in Study Area</b>          |              |              |              |              |              |              |              |              |              |              |              |               |               |                        |
| Commuters from E. Hawaii                         | 2252         | 62           | 1035         | 1132         | 280          | 873          | 1299         | 1160         | 1328         | 1189         | 1320         | 5634          | 6296          | 111930                 |
| Current Workers/Moonlighting                     | 78           | 0            | 39           | 46           | 0            | 41           | 61           | 54           | 62           | 56           | 62           | 204           | 295           | 499                    |
| <b>TOTAL (1)</b>                                 | <b>78</b>    | <b>0</b>     | <b>36</b>    | <b>40</b>    | <b>0</b>     | <b>31</b>    | <b>46</b>    | <b>41</b>    | <b>47</b>    | <b>42</b>    | <b>46</b>    | <b>185</b>    | <b>222</b>    | <b>407</b>             |
| <b>2409</b>                                      | <b>62</b>    | <b>1110</b>  | <b>1218</b>  | <b>280</b>   | <b>280</b>   | <b>944</b>   | <b>1405</b>  | <b>1255</b>  | <b>1437</b>  | <b>1287</b>  | <b>1428</b>  | <b>6023</b>   | <b>6812</b>   | <b>12835</b>           |
| <b>New Available Study Area Labor Supply</b>     |              |              |              |              |              |              |              |              |              |              |              |               |               |                        |
| Surplus from Past Years (2)                      | 199          | 152          | 621          | 16           | 71           | 169          | 38           | 81           | 67           | 82           | 70           | 1228          | 338           | 1566                   |
| Natural Population Increase                      | 97           | 295          | 205          | 207          | 210          | 210          | 214          | 215          | 208          | 209          | 213          | 1224          | 1059          | 2283                   |
| Non-Induced In-Migration                         | 72           | 219          | 152          | 154          | 156          | 156          | 159          | 160          | 154          | 155          | 158          | 909           | 786           | 1695                   |
| <b>TOTAL AVAILABLE LABOR (2)</b>                 | <b>369</b>   | <b>666</b>   | <b>979</b>   | <b>377</b>   | <b>437</b>   | <b>536</b>   | <b>410</b>   | <b>456</b>   | <b>429</b>   | <b>447</b>   | <b>440</b>   | <b>3361</b>   | <b>2182</b>   | <b>5543</b>            |
| <b>Study Area Worker Demand Minus Supply (3)</b> | <b>1884</b>  | <b>-604</b>  | <b>56</b>    | <b>756</b>   | <b>-157</b>  | <b>337</b>   | <b>888</b>   | <b>703</b>   | <b>899</b>   | <b>743</b>   | <b>879</b>   | <b>2272</b>   | <b>4112</b>   | <b>6384</b>            |

(1) Total demand for workers somewhat less than total new jobs due to multiple jobholding factor of 1.09 workers per job (Community Resources, Inc., and Datametric Research, 1987). Demand for commuters and moonlighters is assumed only if total available Study Area is not adequate to fill all new Study Area jobs.

(2) Total available labor excludes ten percent of unemployed in-migrants and three percent of other unemployed on-island workers, reflecting "full employment" assumptions. These become part of the "surplus" category for the subsequent year.

(3) Positive numbers indicate required Induced In-Migrant Workers; negative numbers indicate labor surplus and rising unemployment.

Table V-18:

Distribution of New Study Area Jobs and Workers  
[Includes Both Resort and Non-Resort]

|                                                                    | Opening Date |              |              |              |              |              |              |              |              |              | Sub-Totals   |               |               | Total<br>1988-<br>1998 |
|--------------------------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|------------------------|
|                                                                    | Dec.<br>1988 | July<br>1989 | July<br>1990 | July<br>1991 | July<br>1992 | July<br>1993 | July<br>1994 | July<br>1995 | July<br>1996 | July<br>1997 | July<br>1998 | 1988-<br>1993 | 1994-<br>1998 |                        |
| <b>Distribution of New Jobs Located in Study Area</b>              |              |              |              |              |              |              |              |              |              |              |              |               |               |                        |
| Available Labor: On-Island 1 Year or More                          | 323          | 46           | 901          | 244          | 196          | 414          | 274          | 323          | 300          | 318          | 308          | 2124          | 1523          | 3647                   |
| Available Labor: Non-Induced In-Migrants                           | 79           | 22           | 166          | 167          | 109          | 170          | 173          | 174          | 168          | 169          | 172          | 713           | 856           | 1569                   |
| Induced In-Migrants                                                | 2053         | 0            | 61           | 824          | 0            | 368          | 968          | 766          | 980          | 809          | 959          | 3306          | 4482          | 7788                   |
| Commuters                                                          | 78           | 0            | 39           | 46           | 0            | 41           | 61           | 54           | 62           | 56           | 62           | 204           | 295           | 499                    |
| Current Workers/<br>Moonlighting                                   | 78           | 0            | 36           | 40           | 0            | 31           | 46           | 41           | 47           | 42           | 46           | 185           | 222           | 407                    |
| <b>TOTAL</b>                                                       | <b>2612</b>  | <b>68</b>    | <b>1203</b>  | <b>1320</b>  | <b>305</b>   | <b>1023</b>  | <b>1522</b>  | <b>1359</b>  | <b>1557</b>  | <b>1394</b>  | <b>1547</b>  | <b>6532</b>   | <b>7379</b>   | <b>13911</b>           |
| <b>Distribution of New Study Area Workers Living in Study Area</b> |              |              |              |              |              |              |              |              |              |              |              |               |               |                        |
| Available Labor: On-Island 1 Year or More                          | 297          | 42           | 827          | 223          | 180          | 380          | 251          | 296          | 275          | 292          | 282          | 1949          | 1396          | 3345                   |
| Available Labor: Non-Induced In-Migrants                           | 72           | 20           | 152          | 154          | 100          | 156          | 159          | 160          | 154          | 155          | 158          | 654           | 786           | 1440                   |
| Induced In-Migrants                                                | 1884         | 0            | 56           | 756          | 0            | 337          | 888          | 703          | 899          | 743          | 879          | 3033          | 4112          | 7145                   |
| <b>TOTAL</b>                                                       | <b>2252</b>  | <b>62</b>    | <b>1035</b>  | <b>1132</b>  | <b>280</b>   | <b>873</b>   | <b>1299</b>  | <b>1160</b>  | <b>1328</b>  | <b>1189</b>  | <b>1320</b>  | <b>5636</b>   | <b>6296</b>   | <b>11932</b>           |

Source: Community Resources, Inc. (1987) labor supply demand, utilizing key assumptions discussed in text.

It should be noted that the labor supply/demand analysis assumes that most available unemployed Study Area workers will be qualified and motivated to fill new job openings -- whether on-site at resorts, in off-site jobs, or non-resort-related opportunities. As discussed at more length in the following section on "Socio-Economic Mitigations", job training and related programs could both strengthen the basis for this assumption and perhaps further reduce the need for in-migrant workers by increasing the number of West Hawaii people entering the labor force.

While cumulative West Hawaii resort development (if actually carried out to the extent which has been assumed here) would unquestionably require increased levels of in-migration, there are several potential sources of labor supply among current residents which will provide "natural increase" in the West Hawaii workforce (and/or which can be further tapped to reduce in-migration):

Future High School Graduates: According to estimates provided by the Hawaii State Department of Education (personal communication, Ed Matsushige, Information Specialist, Information System Services Branch, Office of Business Services, April 27, 1987), senior class members from 1987 to 1990 will total about 2,100 for the three Study Area public high schools (Kohala, Honoka'a, and Konawaena). From 1991 to 1993, there would be another 1,650 seniors. These numbers do not take into account either the recent Parker School closing in Waimea or the prospect of further in-migration in the next several years.

The issues for manpower development involve how many of these graduates will remain (or return) and whether they will have initial qualifications and motivation for on- or off-site resort-generated jobs. A Department of Education survey of 1985 Big Island high school seniors (unpublished figures provided by Nan Yuen, Educational Specialist for Guidance and Counseling, April 28, 1987 -- individual school results not available) provides only limited evidence. Only 21 percent had definite plans to work full-time, but only about 32 percent had definite plans to attend a four-year college. Until better data sources are available, it may be more appropriate to focus less on forecasts than on action strategies to increase high school seniors' qualifications and interest in future West Hawaii job opportunities.

Females: U.S. Census data for 1980 indicate West Hawaii females had a labor force participation rate some 20 percentage points lower than the rate for males (57 percent vs. 79 percent -- Community Resources, Inc., 1986, p. 19). Additionally, women with children aged six and under had a particularly low rate. While this may in some cases reflect values and preferences, the particularly high participation rates of women with older children (70 percent) suggest that lack of child care may be a barrier to needed or desired employment on the part of mothers of younger children.

Resort personnel offices also report that lack of child care facilities can be a barrier to promotions, since after-work classes and other upgrade training may require periods of evening or weekend work. Thus, more child care services could increase the availability of those females who want to work.

Elderly and/or Handicapped: With the aging of the overall American population and an actual reduction in numbers of teenagers, a national concern has emerged over filling service jobs (such as fast-food counter help) normally taken by young people just entering the labor market. Several frequently cited possible replacement sources are the elderly and/or handicapped (Bacas, 1986), and more of these persons are starting to become visible in Hawaii establishments.

For West Hawaii and the State in general, the elderly represent the more numerous potential source. Statewide projections show a 74 percent expected increase from 1980 to 2000 in the population aged 60 or more (Hawaii State Commission on Manpower and Full Employment, 1984). There is a need for better local research on the actual employment needs, interests, and aptitudes among Hawaii's elderly, since the few preliminary surveys conducted to date provide conflicting results about desire for continued work after "retirement" age; however, the one survey which asked about reasons for wanting to work found that the principal motives more often had to do with desires such as "Independence" and "To Be Needed" rather than "Financial" need (ibid., pp. 14 - 15). Thus, part-time service employment in such occupations as retail sales, hostessing, and other low-pressure people-contact occupations would appear to be in harmony with the level of interest and abilities among some of the active elderly.

The Educationally Disadvantaged: School drop-outs or non-English speakers are among those for whom chronic unemployment or lack of job preparation has resulted in withdrawal from the labor force. Estimates of exact numbers of such individuals in West Hawaii are not available, but social agency informants suggest these are largely young adults (including some teen-aged mothers).

Because many entry-level resort jobs do not require much educational background, resort work provides a good opportunity for integrating such individuals into the labor force. However, for many of the "hard-core" unemployed, deficits are as much or more related to work habits, attitudes, and self-image as to academic abilities. Other persons with educational limitations may be well motivated and actually in the workforce, but have difficulty obtaining promotions due to inadequate English.

The Attitudinally or Culturally Disinclined: People with simple attitudinal disinterest in resort jobs can still benefit from tourism growth due to the indirect employment generated. However, to the extent that negative attitudes may be based on misperceptions, educational programs would clearly increase the effective available labor supply.

There has been considerable debate -- but little systematic research -- as to whether native Hawaiians and other Polynesians in Hawaii have any particular cultural inclination or disinclination for resort work. It may be noted that Hawaiians and part-Hawaiians currently make up about one-third of the workforce at both the Westin Mauna Kea and the Mauna Lani Bay Hotel, the largest single ethnic group at each hotel (Community Resources, Inc. and Datametric Research, 1987).

However, there is also a body of evidence suggesting that at least some native Hawaiians still have cultural difficulties with Western work settings

in general. Of all major ethnic groups in the state, Hawaiians have the highest unemployment rate (Hawaii State Department of Labor and Industrial Relations, 1985). A variety of studies on Hawaiian "underachievement" in both employment and educational settings has identified several crucial factors -- an affiliation- rather than achievement-oriented motivational structure; emphasis on accumulation of social rather than financial capital; fear of failure; avoidance of personal confrontations; and continued effects of culture loss during the 19th Century.

Given that part-Hawaiians represent one of the fastest-growing ethnic groups on the Big Island, it is appropriate to consider including cultural factors in any programs aimed at maximizing resident employment at future resorts (see Section 1.2.8 on Socio-Economic Mitigations).

### **1.2.5 Off-Site and Total Population Impacts**

#### **1.2.5.1 Construction Phase**

Usually, population growth due to construction is temporary and is thus better discussed in conjunction with construction housing impacts (Section 1.2.6.1).

While the timing and magnitude of South Kohala Resort construction is unlikely by itself to encourage off-island workers to relocate permanently to West Hawaii, the theoretical cumulative scenario for the 1994-98 period -- if it become reality -- might result in construction workers from East Hawaii or other islands settling in West Hawaii for a while.

Under this hypothetical 1994-98 scenario, Table V-10 suggests there would be roughly 950 on-site resort construction workers at any given time. Assuming as before that 20 percent come from outside the Study Area, and making the further conservative assumptions that all of these would relocate and that each construction worker would bring a household averaging 3.5 persons, the implied population growth would be 665.

#### **1.2.5.2 Operational Phase: Methods for Population and Housing Impact Estimates**

Definitions of "Impact": Socio-economic "impacts" are conventionally defined as the difference between the future with the project and the future without the project (rather than the difference between the future vs. present conditions). For most of the topics discussed thus far, this definition has not been particularly important.

However, for population and housing impacts, this definition is important. That is because the County has requested data on two types of "impacts" -- project impacts and cumulative resort development impacts. For jobs, the "cumulative" impact involved just adding up individual project impacts. But the CRI approach to population and housing (see below) assumes different levels of immediate impacts depending on what proportion of the workers are on-island vs. in-migrants (since in-migrants tend to have smaller families and a greater propensity to share housing units). This leads to a need for projecting three different scenarios for the future:

- (A) Scenario of "NO RESORT DEVELOPMENT SINCE BASE YEAR": This assumes no new resort construction since a designated base year -- in this case, 1985, the last year for which data are available regarding both estimated resident population and also visitor inventory in West Hawaii. Under this scenario, there would be no additional resort jobs (not even the Hyatt Regency Waikoloa jobs), although there would be some new non-resort jobs as set forth in Table V-16, with population and housing growth due to this type of economic growth.
- (B) Scenario of "NO RESORT DEVELOPMENT SINCE PREVIOUS YEAR": This assumes that resort development came to a stop in the preceding year. For example, for 1993, it would assume that "Hotel X" did open but that the South Kohala Resort Hotel did not.
- (C) Scenario of "ALL SCHEDULED RESORT CONSTRUCTION": This assumes that all new resort units indicated in Table V-5 open according to the schedule in that table.

Thus, for any given year, cumulative resort development impact is defined as the result of subtracting Scenario A from Scenario C. Individual project impact is defined as the result of subtracting Scenario B from Scenario C.

Assumptions and Method for Estimating Off-Site Population: The aspect of off-site population growth which can best be identified is "population supported by jobs" -- the number of workers plus other family/household members. Data from the Employee Survey of Mauna Lani and Mauna Kea workers (Community Resources and Datametric Research, 1987) indicate that hotel workers who have in-migrated during the past five years have a relatively low household population per worker (1.46), which is taken as the appropriate multiplier for future in-migrants. For future resort workers coming from the pool of available labor already living in the Study Area, the multiplier used is that recommended by DAHI -- i.e., the 1980 Census figure for West Hawaii of 2.07. (The DAHI approach would use the 2.07 figure for all workers; the difference between CRI and DAHI approaches on population and housing will be further discussed in Section 1.2.6.2.)

Table V-19 shows: (1) the overall estimated off-site population supported by all new resort and non-resort jobs (i.e., population under the foregoing "Scenario C"); (2) population calculated by the same general procedures, but subtracting out effects due to Scenario B (i.e., project impacts on population); and (3) population calculated after subtracting out effects under Scenario A (i.e., cumulative resort development impacts on population). As previously explained, in-migration assumptions differ for Scenario A and Scenario B; therefore, the cumulative impacts as of any particular year will not necessarily equal the sum of all project impacts through that year.

### 1.2.5.3 Off-Site Population Impacts

South Kohala Resort Impacts: For the initial South Kohala Resort units in 1993, Table V-19 indicates that islandwide jobs generated by the project would support a population of about 1,150 persons, nearly 85 percent of whom would (eventually) live in the West Hawaii Study Area. About 50 percent of this population would be associated with workers who had in-migrated the

Table V-19:

Total Off-Site Population Impacts

|                                                                                  | Opening Date |           |           |           |           |           |           |           |           |           |           |
|----------------------------------------------------------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                                                                  | Dec. 1988    | July 1989 | July 1990 | July 1991 | July 1992 | July 1993 | July 1994 | July 1995 | July 1996 | July 1997 | July 1998 |
| Population Supported by All New Study Area Jobs (Both Resort and Non-Resort) (1) | 614          | 86        | 1712      | 462       | 372       | 786       | 522       | 614       | 569       | 603       | 584       |
| Available Study Area Labor:                                                      |              |           |           |           |           |           |           |           |           |           |           |
| On-Island 1 Year or More                                                         | 105          | 30        | 222       | 224       | 146       | 228       | 231       | 233       | 225       | 227       | 231       |
| Non-Induced In-Migrants                                                          | 2750         | 0         | 81        | 1103      | 0         | 492       | 1297      | 1027      | 1313      | 1084      | 1284      |
| Induced In-Migrants                                                              | 3469         | 116       | 2015      | 1789      | 518       | 1506      | 2050      | 1874      | 2107      | 1914      | 2099      |
| STUDY AREA SUBTOTAL                                                              | 549          | 0         | 190       | 236       | 0         | 184       | 359       | 363       | 361       | 366       | 381       |
| Rest of Island                                                                   | 4018         | 116       | 2205      | 2025      | 518       | 1690      | 2408      | 2237      | 2469      | 2280      | 2481      |
| ISLAND TOTAL                                                                     |              |           |           |           |           |           |           |           |           |           |           |
| Population Impacts From Development of Resorts in Individual Years (2)           | 510          | 0         | 1263      | 119       | 0         | 375       | 166       | 238       | 156       | 182       | 171       |
| Available Study Area Labor:                                                      |              |           |           |           |           |           |           |           |           |           |           |
| On-Island 1 Year or More                                                         | 88           | 0         | 164       | 58        | 0         | 109       | 74        | 90        | 61        | 69        | 67        |
| Non-Induced In-Migrants                                                          | 2750         | 0         | 81        | 1103      | 0         | 492       | 1297      | 1027      | 1313      | 1084      | 1284      |
| Induced In-Migrants                                                              | 3348         | 0         | 1508      | 1208      | 0         | 976       | 1536      | 1354      | 1530      | 1335      | 1522      |
| STUDY AREA SUBTOTAL                                                              | 549          | 0         | 190       | 236       | 0         | 184       | 359       | 363       | 361       | 366       | 381       |
| Rest of Island                                                                   | 3898         | 0         | 1698      | 1515      | 0         | 1160      | 1895      | 1718      | 1891      | 1701      | 1903      |
| ISLAND TOTAL                                                                     |              |           |           |           |           |           |           |           |           |           |           |
| SOUTH KOHALA RESORT SHARE                                                        |              |           |           |           |           |           |           |           |           |           |           |
| Percentage of Jobs (3)                                                           | 0            | 0         | 0         | 0         | 0         | 100%      | 8%        | 9%        | 8%        | 9%        | 8%        |
| Number                                                                           |              |           |           |           |           | 1160      | 152       | 155       | 151       | 153       | 152       |
| Population Impacts From Cumulative Development of New Resorts (4)                | 510          | 503       | 1753      | 1707      | 1566      | 1835      | 1835      | 1927      | 1907      | 1919      | 1912      |
| Available Study Area Labor:                                                      |              |           |           |           |           |           |           |           |           |           |           |
| On-Island 1 Year or More                                                         | 88           | 93        | 266       | 440       | 539       | 723       | 913       | 1107      | 1292      | 1480      | 1673      |
| Non-Induced In-Migrants                                                          | 2750         | 2750      | 2831      | 3934      | 3934      | 4426      | 5723      | 6750      | 8063      | 9147      | 10431     |
| Induced In-Migrants                                                              | 3348         | 3346      | 4850      | 6081      | 6040      | 6985      | 8472      | 9783      | 11262     | 12546     | 14016     |
| STUDY AREA SUBTOTAL                                                              | 549          | 549       | 740       | 975       | 975       | 1160      | 1518      | 1882      | 2243      | 2609      | 2991      |
| Rest of Island                                                                   | 3898         | 3895      | 5589      | 7056      | 7015      | 8144      | 9991      | 11665     | 13505     | 15155     | 17006     |
| ISLAND TOTAL                                                                     |              |           |           |           |           |           |           |           |           |           |           |

(1) For Available Study Area Labor and "Rest of Island," population computed by multiplying number of workers (see Table V-15) by 1980 Study Area population/workers ratio of 2.07, as recommended by DAHI. For various in-migrant categories, multiplier is 1.46, as determined from Employee Survey figure for "Newcomers" (Community Resources, Inc. and Datametric Research, 1987).

(2) Previous results, minus results of a similar analysis which assumed for each year that new resort construction had stopped in previous year.

(3) Based on Table V-15.

(4) Initial results, minus results of a similar analysis which assumed no new resort construction since 1985. As explained in text, cumulative impacts are not necessarily equal to sum of incremental impacts.

preceding year or in response to the labor shortage expected when the Resort opens. The remainder would be on-island population which, arguably, might otherwise out-migrate in the absence of new jobs.

Under the EIS assumptions, the population impact of new resort development between 1994 and 1998 would support from 1,700 to 1,900 residents island-wide. Roughly 80 percent of this population each year would be associated with either induced or non-induced in-migrants (see "Definitional Note" in Section 1.2.4). Since new South Kohala Resort units would be responsible for about eight or nine percent of new jobs during this period, it is assumed that a similar percentage of the supported population (or roughly 150 to 155 new residents) can be attributed to new development at the South Kohala Resort for each year from 1994 to 1998.

For the total 350 hotel, 450 condominium, and 110 single-family units, then, the combined off-site population impact would be a little over 1,900 people, roughly 60 percent of whom would be induced or recent non-induced in-migrants.

Cumulative Resort Development Impacts: The total resort development assumed for the period 1988 to 1998 would provide jobs supporting about 17,000 people, more than 80 percent of whom would eventually live in the West Hawaii Study Area. Because of the assumed heavy induced in-migration in the 1990's, more than 60 percent of this population would be associated with workers moving from elsewhere to West Hawaii to fill labor shortages. Including non-induced in-migrants (people expected to move to West Hawaii anyway, even before jobs become available), the proportion of in-migrants would exceed 70 percent.

#### **1.2.5.4 Total De Facto Population Impacts**

Total de facto population impacts would include both on-site and off-site population, and also the average daily on-site population discussed in Section 1.2.2 ("average" figures from Table V-8). Table V-20 shows the projected total resident and visitor populations for the South Kohala Resort at build-out (3,050 residents and visitors, on average) and for cumulative resort projects (25,540 total). These figures include both new people and existing residents supported by the new jobs.

#### **1.2.6 Housing Impacts and Requirements**

##### **1.2.6.1 Construction Period**

South Kohala Resort: During the current Hyatt Regency Waikoloa construction period, rental housing in the Study Area has become scarce and rents have increased. According to the real estate agent hired to assist construction workers with housing needs (personal communication, India Hoogs, West Hawaii Property Services, March 6, 1987), the current shortage is associated somewhat with out-of-area workers taking housing but even more with increased visitor levels and a consequent shift in apartment/condominium units from residential to visitor use.

Table V-10 in Section 1.2.3 shows that the average daily number of resort construction workers in the Kohala area will decrease significantly after



TABLE V-20

Total Resident and Visitor Population Impacts  
(numbers rounded)

|                                       | <u>South Kohala Resort Project</u> |             |             |             |             |             | <u>Total</u> |
|---------------------------------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
|                                       | <u>1993</u>                        | <u>1994</u> | <u>1995</u> | <u>1996</u> | <u>1997</u> | <u>1998</u> |              |
| Off-Site Residents*                   | 1,160                              | 150         | 155         | 150         | 155         | 150         | 1,920        |
| On-Site Residents**                   | 20                                 | 80          | 80          | 80          | 80          | 75          | 415          |
| Subtotal, Residents                   | 1,180                              | 230         | 235         | 230         | 235         | 225         | 2,335        |
| Average Daily<br>Visitors:            | 465                                | 50          | 50          | 50          | 50          | 50          | 715          |
| Total Population<br>(incl. visitors): | 1,645                              | 280         | 285         | 280         | 285         | 275         | 3,050        |

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|                                       | <u>Cumulative Resort Projects</u> |                    |
|---------------------------------------|-----------------------------------|--------------------|
|                                       | <u>1988 - 1993</u>                | <u>1988 - 1998</u> |
| Off-Site Residents*                   | 8,145                             | 17,000             |
| On-Site Residents**                   | 20                                | 1,480              |
| Subtotal Residents                    | 8,165                             | 18,480             |
| Average Daily Visitors:               | 3,410                             | 7,060              |
| Total Population<br>(incl. visitors): | 11,575                            | 25,540             |

\* From Table V-19

\*\* From Table V-8

construction of the Hyatt is completed. During these subsequent years, peaks in the number of workers will occur in 1989-1990 (the final year of construction at the Ritz-Carlton), and during the final year of hotel construction at the South Kohala Resort (1992-1993). However, given the overall smaller construction workforce expected to be required during the latter timeframe (which would include the South Kohala Resort and a hypothetical hotel to be completed in 1994), it is expected that construction housing impacts will be significantly less than currently being experienced in the area at present.

Assuming an average three construction workers to a unit, and 20 percent of on-site construction workers in need of Study Area temporary housing, on-site construction employment figures in Table V-10 result in the following yearly average demand for Study Area units, based on South Kohala Resort construction only:

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| <u>1988-89</u> | <u>1989-90</u> | <u>1990-91</u> | <u>1991-92</u> | <u>1992-93</u> |
| 2              | 2              | 5              | 18             | 16             |
| <u>1993-94</u> | <u>1994-95</u> | <u>1995-96</u> | <u>1996-97</u> | <u>1997-98</u> |
| 9              | 8              | 8              | 8              | 7              |

(NOTE: The above figures are averages. In reality, the numbers would vary, depending on the exact stage of construction. For example, as suggested by the construction employment curve shown in Figure V-1(a), the figures between 1991 and 1993 would actually fluctuate from a low of four units at the beginning of construction to a high of 29 units during construction peak.)

Cumulative: During the construction overlap covering South Kohala Resort's conclusion and the beginning of the hypothetical 1994 hotel (Figure V-1(b)), the combined demand by out-of-area workers for both projects is estimated at 30 to 38 units (depending on month).

Between 1994 and 1998, the timing and the extent of other construction at this time is extremely speculative. However, given the assumptions which have been made for illustrative "worst-case" purposes (Table V-5), there would be an average need for 47 units, reaching 70 to 80 if all projects would peak simultaneously. However, such a sustained construction boom could well encourage permanent relocation and resolution of housing needs through purchase rather than rental. By the more conservative assumptions of Section 1.2.5.1 on construction population impacts, which assumed that each relocating worker would require a separate unit, the estimated demand would be for about 190 units.

## 1.2.6.2 Operational Period

### 1.2.6.2.1 Timing and Attribution of Impacts

Population and housing impacts of economic development shift over time, in ways that are not always easy to predict. For example, four recently-hired new resort workers might be young singles sharing one housing unit. A generation later, these four young people might each be supporting a family of five or six, living now in four different housing units. Alternatively, the original four young workers might have left, only to be replaced by four other people sharing the same one unit. Little data currently exist to allow firm forecasts regarding long-term shifts in impact, even on some average basis.

Past EIS's have generally not addressed the timing question, but have usually calculated resort-related housing impacts in a way which implicitly assumes a short-term timeframe. There has been a traditional distinction between the assumed household sizes and household formation rates of in-migrants versus on-island available labor. It has been assumed that some new resort workers would come from other hotels or workplaces in the Study Area ("regional turnover"); this would suggest that some needed in-migrant workers and consequent housing needs are displaced, but these displaced impacts have not always been addressed.

The DAHI approach recommended by the County is implicitly long-term in nature. It assumes that all workers will have characteristics similar to the current Study Area population (i.e., no recognition of differences between in-migrants and current available labor in West Hawaii). More significantly, it assumes that new housing units will be required for all employees of new resorts, whether or not these employees are already on-island and are thus already housed.

The housing impact analysis by CRI addresses the timing issue in the following way:

- o The DAHI approach is utilized to present a picture of theoretical ultimate impacts, perhaps a generation or two from now ("theoretical" because it is questionable whether 100 percent of currently available on-island labor will ever form totally new households).
- o For more immediate housing impacts, CRI utilizes a procedure similar to that in past EIS's -- i.e., attributing different types of impacts to in-migrants vs. those already in the Study Area -- except that "regional turnover" is not discounted as in the past (i.e., if someone leaves another job in West Hawaii to work at the South Kohala Resort, that person's replacement and his/her housing need is counted as a South Kohala Resort impact).

Because the CRI approach distinguishes between types of impacts ("non-induced in-migrants" who are assumed to be already in the Study Area, vs. "induced in-migrants" who do not come until new jobs open up), the following analysis of immediate housing impacts gives a range of results. At the low end, it is assumed that, since non-induced in-migrants are already living in the Study Area, they will form new households at the same rate as other current residents. At the high end of the range, it is assumed that housing demand generated by recent in-migrants should be considered a retroactive impact of the project which allows these in-migrants to remain -- i.e., non-induced in-migrants, like induced in-migrants, all require totally new housing which does not now exist.

#### 1.2.6.2.2 Islandwide and Study Area Housing Impacts

Table V-21 provides assumptions and results of the various approaches for assessing housing impacts related to people supported by new jobs (whether on-site or off-site). As with the population impact table (Table V-19), there are various categories of "impact" -- the combined effects of new resort and non-resort development, the effects of resort development one year at a time, and the effects of cumulative resort development (excluding non-resort effects expected to occur anyway).

Table V-21:  
Total Off-Site Housing Impacts

|                                                                        | Opening Date |           |             |             |            |                |              |              |              |              |              |
|------------------------------------------------------------------------|--------------|-----------|-------------|-------------|------------|----------------|--------------|--------------|--------------|--------------|--------------|
|                                                                        | Dec. 1988    | July 1989 | July 1990   | July 1991   | July 1992  | July 1993      | July 1994    | July 1995    | July 1996    | July 1997    | July 1998    |
| <b>For Population Supported By</b>                                     |              |           |             |             |            |                |              |              |              |              |              |
| <b>All New Study Area Jobs</b>                                         |              |           |             |             |            |                |              |              |              |              |              |
| <b>(Both Resort and Non-Resort)</b>                                    |              |           |             |             |            |                |              |              |              |              |              |
| <b>Immediate</b>                                                       |              |           |             |             |            |                |              |              |              |              |              |
| Available Study Area Labor:                                            |              |           |             |             |            |                |              |              |              |              |              |
| On-Island 1 Year or More (1)                                           | 31           | 4         | 87          | 23          | 19         | 40             | 27           | 31           | 29           | 31           | 30           |
| Non-Induced In-Migrants (2)                                            | 5-25         | 2-7       | 11-54       | 11-55       | 7-36       | 12-56          | 12-57        | 12-57        | 11-55        | 12-56        | 12-56        |
| Induced In-Migrants (2)                                                | 671          | 0         | 20          | 269         | 0          | 120            | 316          | 250          | 320          | 264          | 313          |
| <b>STUDY AREA SUBTOTAL</b>                                             | <b>707-</b>  | <b>6-</b> | <b>118-</b> | <b>304-</b> | <b>26-</b> | <b>172-</b>    | <b>355-</b>  | <b>293-</b>  | <b>361-</b>  | <b>307-</b>  | <b>355-</b>  |
| Rest of Island (1)                                                     | 728          | 12        | 161         | 347         | 55         | 216            | 399          | 338          | 404          | 350          | 399          |
| ISLANDWIDE TOTAL                                                       | 28           | 0         | 10          | 12          | 0          | 9              | 18           | 18           | 18           | 19           | 19           |
|                                                                        | 735-         | 6-        | 128-        | 316-        | 26-        | 181-           | 373-         | 312-         | 379-         | 325-         | 374-         |
|                                                                        | 756          | 12        | 171         | 359         | 55         | 225            | 417          | 357          | 422          | 369          | 419          |
| <b>Theoretical Eventual (3)</b>                                        |              |           |             |             |            |                |              |              |              |              |              |
| Study Area                                                             | 1580         | 43        | 726         | 795         | 196        | 612            | 911          | 814          | 932          | 835          | 926          |
| Rest of Island                                                         | 186          | 0         | 64          | 80          | 0          | 62             | 122          | 123          | 122          | 124          | 129          |
| <b>ISLANDWIDE TOTAL</b>                                                | <b>1767</b>  | <b>43</b> | <b>790</b>  | <b>874</b>  | <b>196</b> | <b>675</b>     | <b>1033</b>  | <b>937</b>   | <b>1055</b>  | <b>959</b>   | <b>1055</b>  |
| <b>Housing Impacts From Development of Resorts in Individual Years</b> |              |           |             |             |            |                |              |              |              |              |              |
| <b>Immediate</b>                                                       |              |           |             |             |            |                |              |              |              |              |              |
| Available Study Area Labor:                                            |              |           |             |             |            |                |              |              |              |              |              |
| On-Island 1 Year or More (1)                                           | 26           | 0         | 64          | 6           | 0          | 19             | 8            | 12           | 8            | 9            | 9            |
| Non-Induced In-Migrants (2)                                            | 4-21         | 0         | 8-40        | 3-14        | 0          | 6-27           | 4-16         | 5-22         | 3-15         | 3-17         | 3-17         |
| Induced In-Migrants (2)                                                | 671          | 0         | 20          | 269         | 0          | 120            | 316          | 250          | 320          | 264          | 313          |
| <b>STUDY AREA SUBTOTAL</b>                                             | <b>701-</b>  | <b>0</b>  | <b>92-</b>  | <b>278-</b> | <b>0</b>   | <b>145-</b>    | <b>328-</b>  | <b>267-</b>  | <b>331-</b>  | <b>277-</b>  | <b>325-</b>  |
| Rest of Island (1)                                                     | 718          | 0         | 124         | 289         | 0          | 166            | 343          | 284          | 343          | 290          | 338          |
| ISLANDWIDE TOTAL                                                       | 28           | 0         | 10          | 12          | 0          | 9              | 18           | 18           | 18           | 19           | 19           |
|                                                                        | 729-         | 0         | 102-        | 290-        | 0          | 154-           | 347-         | 286-         | 350-         | 296-         | 345-         |
|                                                                        | 746          | 0         | 134         | 301         | 0          | 175            | 361          | 303          | 362          | 309          | 358          |
| <b>SOUTH KOHALA RESORT SHARE (4)</b>                                   | <b>0</b>     | <b>0</b>  | <b>0</b>    | <b>0</b>    | <b>0</b>   | <b>154-175</b> | <b>28-29</b> | <b>26-27</b> | <b>28-29</b> | <b>27-28</b> | <b>28-29</b> |
| <b>Theoretical Eventual (3)</b>                                        |              |           |             |             |            |                |              |              |              |              |              |
| Study Area                                                             | 1537         | 0         | 546         | 598         | 0          | 416            | 715          | 617          | 713          | 616          | 707          |
| Rest of Island                                                         | 186          | 0         | 64          | 80          | 0          | 62             | 122          | 123          | 122          | 124          | 129          |
| <b>ISLANDWIDE TOTAL</b>                                                | <b>1723</b>  | <b>0</b>  | <b>610</b>  | <b>678</b>  | <b>0</b>   | <b>479</b>     | <b>836</b>   | <b>740</b>   | <b>836</b>   | <b>740</b>   | <b>837</b>   |
| <b>SOUTH KOHALA RESORT SHARE (4)</b>                                   | <b>0</b>     | <b>0</b>  | <b>0</b>    | <b>0</b>    | <b>0</b>   | <b>479</b>     | <b>67</b>    | <b>67</b>    | <b>67</b>    | <b>67</b>    | <b>67</b>    |

CONTINUED

Table V-21:  
Total Off-Site Housing Impacts  
(Continued)

|                                                            | Opening Date |             |             |              |              |              |              |              |              |              |              |              |
|------------------------------------------------------------|--------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                                                            | Dec. 1988    | July 1989   | July 1990   | July 1991    | July 1992    | July 1993    | July 1994    | July 1995    | July 1996    | July 1997    | July 1998    |              |
| Housing Impacts From Cumulative Development of New Resorts |              |             |             |              |              |              |              |              |              |              |              |              |
| <u>Immediate</u>                                           |              |             |             |              |              |              |              |              |              |              |              |              |
| Available Study Area Labor:                                |              |             |             |              |              |              |              |              |              |              |              |              |
| On-Island 1 Year or More (1)                               | 26           | 26          | 89          | 87           | 80           | 93           | 93           | 98           | 97           | 98           | 97           | 97           |
| Non-Induced In-Migrants (2)                                | 4-21         | 5-23        | 14-65       | 22-107       | 27-131       | 37-176       | 46-222       | 56-270       | 66-315       | 75-361       | 85-408       | 85-408       |
| Induced In-Migrants (2)                                    | 671          | 671         | 690         | 960          | 960          | 1080         | 1396         | 1646         | 1967         | 2231         | 2544         | 2544         |
| <b>STUDY AREA SUBTOTAL</b>                                 | <b>710-</b>  | <b>701-</b> | <b>793-</b> | <b>1069-</b> | <b>1067-</b> | <b>1210-</b> | <b>1536-</b> | <b>1801-</b> | <b>2129-</b> | <b>2404-</b> | <b>2726-</b> | <b>2726-</b> |
| Rest of Island (1)                                         | 718          | 719         | 844         | 1154         | 1171         | 1349         | 1712         | 2014         | 2379         | 2690         | 3049         | 3049         |
| <b>ISLANDWIDE TOTAL</b>                                    | <b>28</b>    | <b>28</b>   | <b>38</b>   | <b>50</b>    | <b>50</b>    | <b>59</b>    | <b>77</b>    | <b>96</b>    | <b>114</b>   | <b>133</b>   | <b>152</b>   | <b>152</b>   |
|                                                            | 729-         | 729-        | 831-        | 1118-        | 1116-        | 1269-        | 1613-        | 1896-        | 2243-        | 2536-        | 2878-        | 2878-        |
|                                                            | 746          | 747         | 882         | 1203         | 1220         | 1408         | 1789         | 2110         | 2493         | 2822         | 3201         | 3201         |
| <u>Theoretical Eventual (4)</u>                            |              |             |             |              |              |              |              |              |              |              |              |              |
| Study Area                                                 | 4084         | 4084        | 4630        | 5228         | 5228         | 5644         | 6359         | 6976         | 7690         | 8305         | 9013         | 9013         |
| Rest of Island                                             | 489          | 489         | 553         | 633          | 633          | 696          | 817          | 940          | 1063         | 1187         | 1316         | 1316         |
| <b>ISLANDWIDE TOTAL</b>                                    | <b>4573</b>  | <b>4573</b> | <b>5183</b> | <b>5861</b>  | <b>5861</b>  | <b>6340</b>  | <b>7176</b>  | <b>7917</b>  | <b>8753</b>  | <b>9492</b>  | <b>10329</b> | <b>10329</b> |

- (1) Population divided by 1980 Study Area average household size of 2.95, as recommended by DAHI (1986), times assumed 15 percent household formation rate.
- (2) Population divided by average in-migrant household size of 4.10, as determined from Employee Survey figure for "Newcomers" (Community Resources, Inc. and Datametric Research, 1987). For Induced In-Migrants, a 100 percent household formation rate is assumed. For Non-Induced In-Migrants, alternative assumptions are a 15 percent rate (producing lower number in range) or 100 percent (producing higher number).
- (3) Total workers times resident population per worker (2.07), divided by average 1980 resident household size (295). This is the procedure utilized by DAHI (1986).
- (4) Based on percentages indicated in Table V-19.

South Kohala Resort Project Impacts: In 1993, the year when the initial South Kohala Resort units open, all expected new resort and non-resort jobs that year would generate an anticipated immediate demand for about 180 to 225 units (depending on treatment of in-migrants) islandwide, with about 95 percent of these in the West Hawaii Study Area. Subtracting the effects of non-resort jobs expected to come on-line anyway, the impact attributable to the South Kohala Resort would be around 154 to 175 units islandwide. The theoretical ultimate housing impact -- if and when all on-island workers move out of their current households and start new ones -- would be 479 units attributed to the South Kohala Resort, 87 percent of these in the Study Area.

Given the assumptions of many competing projects and subsequent heavy worker in-migration during the 1994-1998 timeframe, the immediate housing impacts in any given year would range from a low of 312 to 357 units to a high of 379 to 422 units islandwide for all new economic development; from 286 to 303 units to a high of 347 to 361 units islandwide due to West Hawaii resort development alone; and 26 to 29 units of resort impacts attributable to the South Kohala Resort. The theoretical ultimate housing impact for the South Kohala Resort would be 67 housing units islandwide for each year from 1994 to 1998.

Cumulative Resort Development Impacts: Cumulative impacts are defined as the difference between developing all assumed new resorts vs. no new resorts since 1985. For the various resorts proposed to open by 1993, islandwide housing impacts would range from about 1,300 to 1,400 units, with a theoretical ultimate impact of over 6,300. Extending the timeframe to 1998, the figures are 2,900 to 3,200, with a theoretical ultimate impact of 10,300 units.

#### 1.2.6.2.3 Immediate Demand by On-Site Workers

For EIS purposes, housing demand by on-site South Kohala Resort workers alone is estimated at two levels: (1) total number of new units demanded, and (2) number of required "assisted" units for workers whose household incomes indicate difficulty in ability to afford market housing. (NOTE: The analysis is limited to more immediate demand, since the long-term DAHI methodology does not extend to on-site workers.)

Table V-22 provides both methods and results. It should be noted that a somewhat different -- and more conservative -- set of assumptions was used for calculating housing demand by on-site workers alone, resulting in figures which suggest that most of the housing demand created by the South Kohala Resort would be due to on-site workers alone.

South Kohala Resort workers at the hotel opening in 1993 are expected to initially require between 129 and 157 new housing units. For subsequent years, the demand for new housing units is expected to range from 14 to 16 units per year. The combined figures total 200 to 234 units.

A common standard for gauging ability to afford for-purchase market housing is whether household incomes reach 80 percent of the median in that area. As indicated in Table V-22, the estimated number of such households would range from 32 to 38 in 1993, and another three to four per year during following years (totalling 49 to 58).

Table V-22:  
Estimated Housing Demand By On-Site South Kohala Resort Workers

|                                   | Jobs<br>[A] (1) | Multiple<br>Jobholding<br>[B] (2) | Required<br>Workers<br>[C = A/B] | Household<br>Formation<br>[D] (3) | Workers<br>Requiring<br>Housing<br>[E = CxD] | House<br>Sharing<br>Rates<br>[F] (2) | Total<br>Units<br>Demanded<br>[G = E/F] | Below 80%<br>of Median<br>Income<br>[H] (4) | Needed<br>Assisted<br>Housing<br>[I = GxH] |
|-----------------------------------|-----------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------------------|--------------------------------------|-----------------------------------------|---------------------------------------------|--------------------------------------------|
| YEAR 1993                         |                 |                                   |                                  |                                   |                                              |                                      |                                         |                                             |                                            |
| Management                        | 49              | 1.05                              | 47                               | 100%                              | 47                                           | 1.5                                  | 31                                      | 8%                                          |                                            |
| Staff                             |                 |                                   |                                  |                                   |                                              |                                      |                                         |                                             |                                            |
| --Commuters                       | 18              | 1.09                              | 16                               | 0%                                | 0                                            | --                                   | --                                      | --                                          |                                            |
| --Current Worker/<br>Moonlighting | 13              | 1.09                              | 12                               | 5%                                | 1                                            | 1.7                                  | 1                                       | 40%                                         |                                            |
| --Available<br>Labor (5)          | 187-<br>253     | 1.09                              | 172-<br>232                      | 15%                               | 25-<br>35                                    | 1.7                                  | 15-<br>21                               | 40%                                         |                                            |
| --In-Migrants (5)                 | 159-<br>227     | 1.09                              | 146-<br>209                      | 100%                              | 146-<br>209                                  | 1.9                                  | 77-<br>110                              | 27%                                         |                                            |
| SUBTOTAL FOR 1993 (6)             | 494             |                                   | 455                              |                                   | 229-282                                      |                                      | 129-157                                 |                                             |                                            |
| YEAR 1994 (7)                     | 40              |                                   | 37                               |                                   | 27-30                                        |                                      | 15-16                                   | 4                                           |                                            |
| YEAR 1995 (7)                     | 40              |                                   | 37                               |                                   | 25-28                                        |                                      | 14-15                                   | 3-4                                         |                                            |
| YEAR 1996 (7)                     | 40              |                                   | 37                               |                                   | 26-29                                        |                                      | 14-16                                   | 4                                           |                                            |
| YEAR 1997 (7)                     | 40              |                                   | 37                               |                                   | 25-28                                        |                                      | 14-15                                   | 3-4                                         |                                            |
| YEAR 1998 (7)                     | 38              |                                   | 35                               |                                   | 25-28                                        |                                      | 14-15                                   | 3-4                                         |                                            |
| TOTALS                            | 692             |                                   | 638                              |                                   | 357-425                                      |                                      | 200-234                                 | 49-58                                       |                                            |

(1) Jobs from Table V-15, with ten percent assumed for management and staff distributed to other categories according to proportions calculated from top of Table V-18.

(2) Figures derived from Employee Survey (Community Resources, Inc. and Datametric Research, 1987).

(3) CRI assumptions based primarily on figures from past EIS housing studies.

(4) Based on 80 percent of West Hawaii Median Income, which was identical to resort worker household income in Employee Survey.

(5) Ranges indicate alternative treatment of non-induced in-migrants.

(6) Figures sometimes do not add to subtotals due to rounding error.

(7) Calculations are same as for 1993, but not replicated in detail due to low numbers and space requirements. The ratio of housing units to workers is greater in 1994-98 than in 1993 due to assumed greater percentages of in-migrants.

Based on predicted employee household incomes, 75 percent of the resort workers may be expected to afford units priced above \$70,000 (assuming an interest rate of 8.5 percent and 30 percent of income available for housing), with 65 percent being able to afford housing priced above \$93,000. Seventy-five percent would be able to afford rents in excess of \$525 per month.

Worker households making less than 80 percent of the median will find it extremely difficult to purchase housing due to the lack of housing in this price range, over-extension of household credit, and lack of savings for down payments. Based on predicted household incomes, this may be approximately 25 percent of worker households. For this group, renting may be a more realistic option. Rents would need to be in the range of \$300 to \$500 per month to accommodate this portion of the work force.

The current Federal Home Administration, insured, 30-year fixed rate in early 1987 was between 8.5 percent and 8.85 percent, with adjustable rate loans at seven percent. The current Hula Mae rate is 8.25 percent. While very real issues such as origination points and down payments remain, interest rates in the current range indicate that housing in West Hawaii is within the grasp of the median-income household.

Due to the temporal nature of interest rates and the fact that many people rent, for the purpose of this analysis it is assumed that households making less than 80 percent of the West Hawaii median income of \$25,000 per year are in need of housing assistance. This may take the form of deeply subsidized for-purchase housing or, perhaps more appropriately, rentals with rates based on a percentage of monthly income. Eighty percent of the median (\$1,666 per month) falls within the surveyed range of \$1,501 to \$1,750 per month. Affordability as a function of interest rates is depicted in Table V-23.

Characteristics and Location of Demanded Units: Employee Survey results indicate that 71 percent of current workers live in single-family housing and 21 percent in multi-family units, although a higher proportion (31 percent) of recent in-migrants live in multi-family units. The average number of rooms per unit reported in the survey was six, indicating a typical unit size of two to three bedrooms. It is therefore concluded that the housing in demand by resort workers will be two- to three-bedroom units -- primarily single-family homes, but with increasing willingness to reside in apartment units as more in-migrants enter the West Hawaii workforce.

In terms of location, State and County planning and zoning policies will ultimately determine where the supply of new housing units will be permitted. The local governments are now exploring a new "support community" at Kealakehe north of Kailua-Kona, and there has also been preliminary discussion of other potential support community sites in the Kohala districts. Zoned land is also available at Waikoloa Village, Waimea, and to lesser extents in various North Kohala sites (expansion of existing communities such as Hawi and Kapa'au, as well as some subdivision land between Hawi and Kawaihae).

However, some indication of future residential patterns may also be inferred from an understanding of where workers currently live, as determined by the Employee Survey (Community Resources and Datametric Research, 1987). Table V-24 indicates the residence of various employee groups, including non-



TABLE V-23

Maximum Housing Purchase Price  
(Interest Rate VS. Income)

| Income  | Interest Rate |           |           |           |           |           |
|---------|---------------|-----------|-----------|-----------|-----------|-----------|
|         | 7.0%          | 7.5%      | 8.0%      | 8.5%      | 9.0%      | 9.5%      |
|         | Housing Cost  |           |           |           |           |           |
| \$1,000 | \$ 37,577     | \$ 35,754 | \$ 34,071 | \$ 32,513 | \$ 31,070 | \$ 29,732 |
| \$1,125 | \$ 44,623     | \$ 42,458 | \$ 40,459 | \$ 38,610 | \$ 36,896 | \$ 35,306 |
| \$1,375 | \$ 58,714     | \$ 55,866 | \$ 53,236 | \$ 50,802 | \$ 48,548 | \$ 46,456 |
| \$1,625 | \$ 72,805     | \$ 69,274 | \$ 66,012 | \$ 62,995 | \$ 60,199 | \$ 57,605 |
| \$1,875 | \$ 86,897     | \$ 82,682 | \$ 78,789 | \$ 75,187 | \$ 71,850 | \$ 68,754 |
| \$2,250 | \$108,034     | \$102,794 | \$ 97,954 | \$ 93,476 | \$ 89,328 | \$ 85,479 |
| \$2,750 | \$136,216     | \$129,610 | \$123,507 | \$117,861 | \$112,630 | \$107,777 |
| \$3,250 | \$164,399     | \$156,426 | \$149,060 | \$142,246 | \$135,933 | \$130,076 |
| \$3,750 | \$192,582     | \$183,241 | \$174,613 | \$166,631 | \$159,236 | \$152,375 |

Note: Table calculations based on 30 percent of income available for housing, \$100 per month in additional housing expenses, and 30-year loan term. Standard amortization formula used for present value calculation.

TABLE V-24

## Current Housing Location of Luxury Kohala Resort Employees

|                             | <u>Overall Sample</u>  |                       |                   | <u>Recent (Past Five Years) In-Migrants*</u> |                       |                   |
|-----------------------------|------------------------|-----------------------|-------------------|----------------------------------------------|-----------------------|-------------------|
|                             | <u>Mauna Lani</u><br>% | <u>Mauna Kea</u><br>% | <u>Total</u><br>% | <u>Mauna Lani</u><br>%                       | <u>Mauna Kea</u><br>% | <u>Total</u><br>% |
| Puako/Waikoloa/<br>Kawaihae | 12                     | 9                     | 10                | 12                                           | 18                    | 14                |
| Kamuela/Waimea              | 23                     | 25                    | 24                | 28                                           | 24                    | 27                |
| North Kohala                | 29                     | 39                    | 34                | 12                                           | 24                    | 16                |
| Hamakua                     | 15                     | 23                    | 19                | 21                                           | 15                    | 17                |
| North Kona                  | 18                     | 3                     | 11                | 30                                           | 9                     | 23                |
| South Kona                  | 1                      | 0                     | 1                 | 1                                            | 0                     | 1                 |
| East Hawaii                 | 2                      | 1                     | 2                 | 2                                            | 3                     | 2                 |
| (base:)                     | (371)                  | (358)                 | (729)             | (60)                                         | (33)                  | (94)              |

\* non-management only

Source: Community Resources, Inc., and Datametric Research (1987, pp. 13, 19) -- Survey of Employee Characteristics and Housing Patterns: Westin Mauna Kea and Mauna Lani Resort.

management recent in-migrants, whose preferences are the best indicators of the preferences of future in-migrants. As of now, newcomers tend to live either in North Kona or the Waimea area.

There are some significant ethnic differences in current hotel workers' residential patterns. Caucasians are more likely than other groups to live in Kona and in makai South Kohala (Puako, Waikoloa, etc.) and much less likely than other ethnic groups to live in North Kohala. The other ethnic group with a distinctive pattern consists of Filipinos, who are more likely than most other groups to be living in North Kohala or Hamakua.

The Employee Survey also indicated that the great majority of workers are satisfied with their current areas of residence. However, those most likely to be happy were workers living close to their workplaces (i.e., in the makai parts of South Kohala). Newcomers were particularly likely to want to live in the makai areas, whereas longtime residents were also interested in mauka residential areas.

In terms of actual housing moves following initial employment with a Kohala luxury resort, most workers originally living on-island have not moved from their original area of residence; those who did move tended to shift to mauka South Kohala. People moving from East Hawaii tended to move to the cooler parts of North Hawaii (mauka South Kohala, North Kohala, or Hamakua). In-migrants from other Hawaiian islands were more likely to settle in South Kohala, while in-migrants originally from the Mainland were relatively more likely to end up in Kona or makai South Kohala.

#### 1.2.6.2.4 Future Available Housing

The future availability of housing is dependent upon a number of complex variables, most of which are beyond the control of individual developers or the government. This section will discuss the current status of planning for residential developments, forces likely to influence the market, and possible responses.

The primary economic activity in West Hawaii is tourism. It is not surprising to find a relationship between the growth of tourism and the production of residential housing. Although yearly housing production has been erratic as previously discussed, there has been a consistent increase in residential housing accompanying the increase in visitor units. This relationship is illustrated in Figure V-2.

Project List and Descriptions: Table V-25 lists the major proposed projects in the West Hawaii area (Hawaii County Department of Housing and Community Development and Department of Planning). They are described in terms of location, General Plan status, and the number of single-family, multi-family, and total units. There is no indication as to the planned price range of these units. The numbers involved, however, suggest that a majority will need to be priced to the bulk of the residential market in order to assure their marketability.

Other Potential Market Responses: In addition to traditional single-family and multi-family product, non-traditional housing may be expected to absorb a small percentage of the market. One form often discussed but as yet

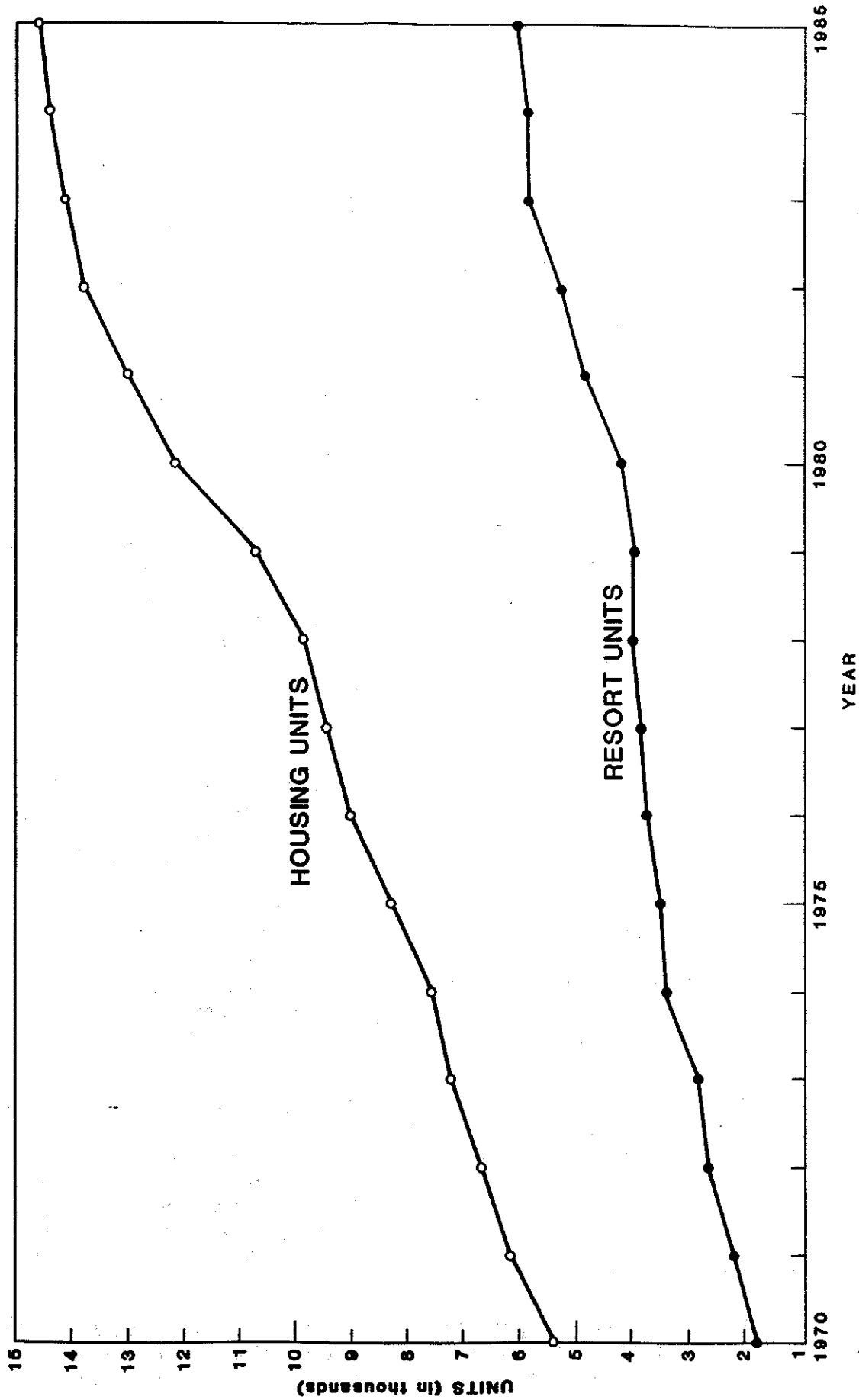


Figure V-2  
RESORT UNITS & HOUSING UNITS

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987

TABLE V-25

## Major Proposed Residential Projects in West Hawaii

| <u>Project</u>      | <u>Location</u> | <u>Gen. Plan<br/>Status</u> | <u>S. F.<br/>Units</u> | <u>M. F.<br/>Units</u> | <u>Total<br/>Units</u> |
|---------------------|-----------------|-----------------------------|------------------------|------------------------|------------------------|
| Parker 2020         | S. Kohala       | Approved                    | 500                    | 150                    | 650                    |
| Ainakea             | N. Kohala       | Approved                    | 100                    | 5.4 ac.                | 120                    |
| Waikoloa Village    | S. Kohala       | Approved                    | 5,800                  | 1,700                  | 7,500                  |
| YO, Inc.            | N. Kona         | Approved                    | 1,093                  | 340                    | 1,433                  |
| Gamlon              | N. Kona         | Approved                    | 215                    | 475                    | 690                    |
| Keauhou View Estate | N. Kona         | Approved                    | 135                    | 140                    | 275                    |
| Kona Coast          | N. Kona         | Approved                    | 73                     | 439                    | 512                    |
| Kohala Ranch        | N. Kohala       | Pending                     |                        |                        | 3,000                  |
| California-Kohala   | S. Kohala       | Pending                     |                        |                        | 2,000                  |
| Puako Heights       | S. Kohala       | Pending                     |                        |                        | 3,000                  |
| Lanihau             | N. Kona         | Pending                     |                        |                        | 3,000                  |
| Kealakehe           | N. Kona         | Pending                     |                        |                        | 3,500                  |

untried in the local market is the dormitory concept. These rooms would be made available at modest rents to mostly transient workers. This would be a large-scale version of the boarding house which is already gaining some popularity in North Kona. Self-help or sweat-equity housing may also find a small market among resort workers due to the relative abundance of reasonably priced lots in the area. A third form, already popular and likely to grow, is the ohana unit in existing residences, both legal and illegal.

### 1.2.7 Qualitative Social Impacts

This section begins with a preliminary analysis of the major socio-economic issues and concerns expressed by community residents in past public testimony. Because the issues arose in connection with this particular project, they may be considered "project-specific."

However, it may soon be apparent that most of these issues relate to West Hawaii resort development in a general way. (The major exception has to do with Hapuna Beach social/recreational factors, which are separately discussed in Section 6 of this chapter.)

Also, the cumulative social effects of resort development often represent more significant impacts than would be expected from any particular project. Therefore, after the initial "project-specific" discussion, the remainder of the "Qualitative Social Impacts" section will focus on West Hawaii (and/or state-wide) resort development in general.

#### 1.2.7.1 Project-Specific Community Issues and Concerns

To the extent that they reflect controversy and polarization, community issues and concerns can themselves be a social impact of a proposed project. These concerns are also worthy of study because certain issues are difficult to assess objectively; if so, the purpose of impact disclosure can best be served by documenting the concerns in the impact statement.

Community attitudes and concerns undergo constant change. The EIS process itself both records and affects public opinion. Therefore, this section is a highly preliminary assessment, based on the testimony of witnesses before the Hawaii County Planning Commission, in contested case hearings on the South Kohala Resort's application for shoreline management area and shoreline setback variance permits. Hearings were held on September 19 - 20 and October 17 - 18, 1985.

A total of 56 individuals gave testimony at these hearings. These included two government officials, four developer representatives, and 50 persons who spoke as private citizens. Of these 50 (30 of whom generally supported the project, with the remaining 20 generally opposed), 17 lived in North or South Kohala; nine in North or South Kona; 14 lived elsewhere on the Big Island; and ten gave no address or lived off-island. Support for the project was greatest among the South/North Kohala residents (70 percent in favor), while opposition was greatest among the ten whose addresses were unknown or off-island (60 percent against).

A wide variety of issues and concerns were expressed before the Planning Commission. They can be grouped into seven major categories for purposes of analysis:

- (1) Need for project due to economic benefits: Supporters of the South Kohala Resort noted that the project would provide needed jobs for local residents. They felt that young people -- now perceived to be leaving the island due to lack of job opportunities -- would be particular beneficiaries, both in initial employment and in greater opportunities for training and promotion. Economic benefits were seen for the entire island of Hawaii, with more tourism stimulating the economy, bringing down unemployment, and helping people escape dependence on welfare.

Comment: Employment impacts were previously discussed in Sections 1.2.3 and 1.2.4. The testimony comments suggest these impacts would be favorably valued by many residents.

2. Danger of overdependence on tourism: Project opponents argued that tourism is not a panacea for Hawaii's need for economic growth. The visitor industry was termed an unpredictable one, allegedly taking more money out of the local economy than it puts in. Opponents also mentioned that occupancy rates in West Hawaii were lower than the statewide average.

Comment: This concern has to do with broad government policies and perceptions as to whether there are viable alternatives to tourism and whether government has adequately encouraged those alternatives. It may be noted that no alternative economic activities proposals have been made for the project site, and that Westin Mauna Kea occupancies have usually been much higher than those in lower-priced West Hawaii hotels.

3. Costs of population influx due to tourism: Opponents of the project often associated it with an increase in resident and visitor population, and inferred that growth would bring with it certain social costs for current residents. More conflict between residents and visitors, overloaded infrastructure, more crime, and overcrowding were considered the likely costs of growth.

Comment: These issues are addressed in subsequent portions of this section.

4. Physical intrusion on Hapuna Beach: Some opponents suggested that the project would be too close to the beach, and too visible from the standpoint of beach users. Removal of natural vegetation was also identified as a form of negative physical impact.

Comment: This issue is addressed in Section 7 of this chapter. As with the following Hapuna Beach concern, however, the extent of testimony on this point indicates that it is a major social concern and that apprehension alone has suggested a significant negative social impact.

5. Impact on enjoyment of Hapuna Beach: Those concerned with project impacts foresaw a negative impact on the use of the Hapuna Beach State Recreation Area as well as the northern portion of Hapuna Beach. The

presence of more visitors on the beach, the projected "domination" of the northern portion by the Resort and its guest activities, and increased noise from helicopter overflights were identified as likely to detract from resident enjoyment of the beach. Speakers concerned about the beach stressed Hapuna's importance as one of the few sandy beaches accessible by the public, and they stressed the need for more public beaches. Safety problems at Hapuna -- involving lack of lifeguards and rescue equipment and the danger of surf conditions in winter months -- were mentioned as a reason not to encourage greater use of the beach by visitors. Some opponents felt that private development adjacent to the northern portion of Hapuna Beach would effectively close the beach to residents, who might find the beach less comfortable or easy to use.

Project supporters contended that the hotel's presence would actually benefit the public, since the hotel would maintain the beach better than government has kept up the State Recreation Area. Frequent rescues of distressed swimmers by Westin Mauna Kea hotel employees were cited as evidence of improved water safety conditions that would follow development.

Comment: This issue is addressed in Section 6 of this chapter.

6. Historic and archaeological resources: Project opponents suggested that development would disturb the variety of historic and archaeological resources present at Hapuna. On the other hand, project proponents argued that a private developer might well do a more responsible job of protecting these resources than would the State.

Comment: This issue is addressed in Chapter IV, Section 7.

7. Credibility of developer: The track record of the developers of the Mauna Kea resort was an issue for both project supporters and opponents. Mauna Kea Properties' commitment to quality growth was applauded by supporters, who also stressed advantages to the community of new infrastructure provided by the resort. Supporters noted that Mauna Kea Properties, together with the neighboring Mauna Lani Resort, had constructed a water system, and were planning a new fire substation (now under construction). Those opposed to the project, particularly those concerned about the future use of Hapuna Beach, suggested that Mauna Kea Properties and the Westin Mauna Kea had not been sensitive to accommodating local residents at Kauna'oa Beach.

Comment: This is an example of a qualitative concern which is difficult to analyze "objectively" because of different historical perspectives, beliefs, and value systems on the part of different residents.

Additionally, certain basic value differences were implicitly (and sometimes explicitly) interwoven with the testimony on specific issues. These generally had to do with the value of preserving open space and rural character (and associated lifestyles) versus the value of preserving family and community continuity through a strong regional economy.



Project opponents often stressed that West Hawaii's rural, open, country feeling was a major reason they had chosen to live in the area. While many such opponents were relative newcomers, some were native Hawaiians who felt that resort development in general often contradicted the concept of "aloha a'ina," and they viewed resort development in the framework of the death of old Hawaii and its culture. Most opponents said they favored continued economic growth but questioned the costs of further resort development (and/or development of this site in particular).

Project supporters also spoke with pride about the special character of the Big Island, but stressed that natural beauty had to be balanced with the need to provide jobs so that residents could continue living there. Some long-time residents noted that the economic history of the Big Island had been one in which many had to leave to obtain suitable employment, and they expressed appreciation for the Westin Mauna Kea's role in blunting unemployment due to the decline in agricultural work over the past several decades. They also tended to view resorts in terms of progress, empty land transformed, and as a means to share Hawaii with others.

Again, these are value differences and trade-offs which cannot be "correctly" or "objectively" analyzed. However, they provide the framework in which social impacts will be differently perceived by different individuals.

#### **1.2.7.2 Forces for Social Change from Overall Resort Development**

Four aspects of resort development have strong implications for social change:

- o resident employment in resort settings;
- o increased visitor population;
- o in-migration of full- or part-time resort residents;
- o in-migration of new workers, leading to changes in population levels or or composition.

##### **1.2.7.2.1 Employment in Resort Settings**

Some frequent concerns expressed regarding resort employment are (1) whether wages and working conditions are adequate; (2) whether longtime residents have a fair share of better jobs; (3) family and psychological factors; and (4) worker satisfaction.

Economic Quality: Table V-26 provides 1985 data on average employment and wages for various types of jobs associated with destination resorts (hotels, other services, eating and drinking places, other retail trade, and transportation), as well as plantation agriculture, with which tourism is often compared.

Table V-26:

Average Statewide and Hawaii County Employment and Annual Wages for Industries Associated with Resorts and Plantation Agriculture, 1985

|                                               | STATEWIDE                 |               |                             |               | HAWAII COUNTY             |               |                             |               |
|-----------------------------------------------|---------------------------|---------------|-----------------------------|---------------|---------------------------|---------------|-----------------------------|---------------|
|                                               | Average Employment<br>no. | % of<br>total | Avg. Annual Wage<br>dollars | % of<br>total | Average Employment<br>no. | % of<br>total | Avg. Annual Wage<br>dollars | % of<br>total |
| <b>TOTAL PRIVATE SECTOR</b>                   | 343,400                   | 100.0%        | \$16,070                    | 100.0%        | 27,963                    | 100.0%        | \$13,896                    | 100.0%        |
| <b>Selected Resort-Related Industries</b>     |                           |               |                             |               |                           |               |                             |               |
| "Hotels, rooming houses, etc."                | 28,947                    | 8.4%          | \$13,601*                   | 84.5%*        | 3,931                     | 14.1%         | \$12,056*                   | 86.8%*        |
| "Eating and drinking places"                  | 40,171                    | 11.7%         | \$ 7,496*                   | 46.6%*        | 2,657                     | 9.5%          | \$ 6,561*                   | 47.2%*        |
| "Other retail trade"                          | 56,036                    | 16.3%         | \$13,029                    | 81.1%         | 4,889                     | 17.5%         | \$11,672                    | 84.0%         |
| "Transportation"                              | 23,439                    | 6.8%          | \$19,508                    | 121.4%        | 1,266                     | 4.5%          | \$17,092                    | 123.0%        |
| <b>Selected Plantation-Related Industries</b> |                           |               |                             |               |                           |               |                             |               |
| "Agriculture, forestry, fisheries:"           |                           |               |                             |               |                           |               |                             |               |
| -- Sugar                                      | 3,079                     | 0.9%          | \$18,258                    | 113.6%        | 181                       | 0.6%          | \$22,200                    | 159.8%        |
| -- Pineapple                                  | 2,056                     | 0.6%          | \$16,157                    | 100.5%        | N/A                       | N/A           | N/A                         | N/A           |
| -- Other Crops                                | 3,061                     | 0.9%          | \$13,095                    | 81.5%         | 2,221                     | 7.9%          | \$13,985                    | 100.6%        |
| "Manufacturing:"                              |                           |               |                             |               |                           |               |                             |               |
| -- Sugar Mills                                | 2,706                     | 0.8%          | \$20,759                    | 129.2%        | 662                       | 2.4%          | \$23,284                    | 167.6%        |
| -- Pineapple canning                          | 2,016                     | 0.6%          | \$14,577                    | 90.7%         | N/A                       | N/A           | N/A                         | N/A           |
| -- Other Food Processing                      | 4,914                     | 1.4%          | \$16,867                    | 105.0%        | 1,306                     | 4.7%          | \$15,486                    | 111.4%        |

\* Wage figures do not include tips/gratuities.

Source: Hawaii State Department of Labor and Industrial Relations, 1986, pp. 2, 3, 10.

Some implications of this table include the following:

- o While the sorts of service jobs commonly associated with resorts make up more than 40 percent of Hawaii's jobs statewide and nearly 46 percent of Big Island jobs (although many such jobs would actually serve residents rather than visitors), average wages for most categories fall below the average wage for all private-sector jobs.
- o Average hotel wages are relatively close to the respective statewide or islandwide averages, but wages for food-and-beverage jobs (which are often just part-time) are below 50 percent of the average private-sector wages. However, note that these figures exclude income from tips/gratuities, which can comprise a substantial portion of income for wait-help and some hotel workers.
- o Wages for sugar workers are higher than the statewide or islandwide average, but relatively few people still work in the sugar industry.

In addition to somewhat low average wages, hotel and other resort-related jobs are subject to seasonal fluctuations and inconvenient and/or split working hours. These problems are particularly acute for entry-level staff workers (who often start on a part-time or casual basis), since workers with seniority are less likely to be laid off in off-season and have more privileges in terms of choosing preferred working hours.

However, it should be noted that the foregoing applies to "average" hotels, and conditions are sometimes different at Kohala luxury hotels such as would be the South Kohala Resort hotel. Related points regarding economic "quality" include:

- o Extrapolating from the current Westin Mauna Kea staff (Table V-12), about 80 percent of all on-site jobs will be full-time, rather than part-time or temporary.
- o Tip income -- which represents the unknown factor in determining how well resort employees are actually compensated -- tends to be higher at luxury hotels.
- o According to the Employee Survey of luxury Kohala hotel workers (Community Resources, Inc., and Datametric Research, 1987), the median overall household income of hotel workers is \$25,668 per year -- which is almost identical to the County Housing Office's estimated median income for all West Hawaii residents (personal communication, Bill Moore, Deputy Director, March 16, 1987). About half the surveyed workers were the primary wage-earners in their households.
- o For particular groups, median incomes were: management/supervisory personnel -- \$35,256/year; full-time workers -- \$23,496; part-time/casual workers -- \$27,672. The higher household income for part-time/casual workers was due to the fact that there were more wage-earners and more jobs per persons among these households.
- o Tourism also generates off-site employment, including support professions such as lawyers and doctors. The ratio of such off-site jobs to

on-site jobs tends to be lower than for sugar plantations; however, the current issue does not involve a choice between tourism and sugar (or any other economic activity) for the South Kohala Resort site, but rather a choice between new tourism jobs and no economic development there.

Resident Opportunities for Better Jobs at Resorts: Most Hawaii hotels are (as is the Westin Mauna Kea) managed by national or international chains which rotate top managers throughout the country or the world. While this can mean an exciting life career for Hawaii-born hotel managers transferred elsewhere, it can also mean that many top managers at Hawaii hotels are not Hawaii-born, sometimes leading to cultural misunderstandings and feelings of resentment by local workers.

At another level, there may be perceptions that some groups -- either Hawaii-born or certain ethnic groups -- tend to end up with the "worst" jobs (such as part-time or casual employment).

Two recent studies which may shed some light on these concerns are the recent Employee Survey of luxury Kohala hotel workers (Community Resources, Inc., and Datametric Research, 1987) and a Cornell University doctoral dissertation by A.M. Bouslog (1985), which utilized ten years worth of Hawaii State Health Surveillance Survey data:

- o Among Mauna Lani and Mauna Kea workers, 63 percent of all employees -- including 55 percent of management/supervisory personnel -- were raised on the Big Island. About one-half the managers had been working at a non-hotel job before taking jobs at the Kohala hotels. While these figures are likely to change if labor demand from cumulative resort development exceeds local supply, the numbers do indicate that Big Island residents historically have not been closed out of Kohala hotel management positions.
- o The 1987 Employee Survey also found that lifelong Big Island residents were slightly less likely than in-migrants to hold the so-called "best" (management) jobs, but they were also much less likely to hold the so-called "worst" (part-time/casual) jobs. Similarly, Caucasians were more likely than other ethnic groups to hold both managerial and part-time/casual jobs.
- o Part-time/casual jobs at these two Kohala hotels were very likely to be held by young people (53 percent were under age 30) and/or people who had in-migrated in the past five years. As previously noted, household incomes were higher for part-time/casual workers than for full-time workers, due to more second jobs and more wage-earners in the household. This could be interpreted either as meaning that these households must struggle harder to survive, or that part-time/casual work provides opportunities for households of people interested in maximizing incomes.
- o The Bouslog (1985) study also looked at ethnic differences in "primary-sector" vs. "secondary-sector" hotel jobs (roughly equivalent to full-time vs. part-time or casual). She found that Caucasians, Japanese, and part-Hawaiians are more likely than others to hold the better jobs.

Filipinos fared the worst, with 79 percent in secondary-sector jobs. However, this is likely a function less of ethnicity than of immigrant status, since 80 percent of foreign-born employees were working in the secondary sector. The implications of these figures are subject to varying interpretations. The most negative would be that immigrants and/or Filipinos are being "exploited." The most positive would be that hotel employment represents an opportunity for less educated immigrants to develop work skills and experiences which will permit them over time to advance to higher rungs of the socio-economic ladder.

- o Bouslog also found that, compared to other civilian industries, Caucasians and Japanese are under-represented in hotel jobs, while Hawaiians and Filipinos are over-represented. Furthermore, age distributions suggest young residents of Japanese ancestry are unlikely to hold hotel jobs, while most of the Caucasians working in hotels are young (and, possibly, transient). The implication, subject to further study, is that Hawaiians and Filipinos are the groups most likely to make hotel work a permanent career and thus to acquire seniority and the better long-range working conditions.

Family and Psychological Factors in Resort Work: Sociological and psychological aspects of resort employment can be categorized as either transitional (aspects related to adjustment to new forms of employment) or permanent (inherent characteristics).

In Hawaii, more attention has been paid to transitional impacts, particularly in communities undergoing a switch from plantation agriculture to tourism as the economic base -- e.g., North Kohala on the Big Island, Kilauea on Kauai, and Kahuku on Oahu. North Kohala's situation resulted in several published studies in the late 1960's and early 1970's (Cottington, 1969; Hawaii State Department of Planning and Economic Development, 1972; Smith, 1972) focusing on family and psychological impacts. It is important to note that the observed impacts occurred before the sugar plantation shut down (although during a period when there was growing concern that a shutdown was inevitable) and when the new resort jobs were being filled almost entirely by women. The Cottington study -- although based largely on anecdotes and never formally published -- received the most widespread publicity. Some of the major conclusions from her study and the others included:

- o Serious marital strains (in some cases leading to divorce and/or wife abuse) attributed to husbands' jealousy over working wives' contacts with male guests, in light of the wives' new behavior patterns associated with work (see below).
- o A new and improved self-image for women, including increased attention to, and pride in, personal appearance; more self-confidence; more assertiveness in family finances. Male self-image, however, suffered.
- o Problems with child care and, to some extent, juvenile delinquency associated with having two working parents.
- o Family financial problems associated with increased income (prior to the plantation closure). The higher incomes led many families to make down payments on expensive consumer items, and their unfamiliarity with the

credit system sometimes left them unable to meet subsequent installment payments.

- o Problems with supervisors of different ethnic backgrounds.

However, the Smith (1972) follow-up study suggested that the family adjustment problems were serious only in a few already-shakey marriages and that most other working wives said their families had adjusted. Similarly, interviews with community leaders in Oahu's Kahuku area (Community Resources Inc., 1985) and Kauai's Kilauea area (Belt Collins & Associates, 1983) produced reports of only limited and temporary family disruptions when wives of ex-plantation workers there entered the resort workforce. A year-long psychiatric study in Kahuku (Young and Kinzie, 1973) found no apparent family or mental health problems during the period when women were starting initial hotel work.

To the extent that any significant family or self-image impacts did occur in Kohala's transitional period (and it is less certain now that there were such impacts), they would have been primarily associated with wives' initial entry into the labor force in general, and only secondarily with resort employment in particular. As of 1987, most Big Island families have already faced this transition and made their adjustments. However, residents of Hamakua may still be facing some adjustments if sugar phases out there and substantial numbers of residents begin commuting to work in West Hawaii hotels for the first time.

Less research, although considerable speculation, has been devoted to apparently inherent problematic aspects of resort work, including:

- o Shift work, common for hotels and other service establishments, presents logistical problems for families with children, and it may reduce the amount of time which husbands and wives can share at home together.
- o "Glamour-and-gossip" work setting at some hotels may still constitute a challenge to the established values of some rural employees, and the close-knit nature of the workforce can result in gossip about even innocent smiles or flirtations between workers and guests.
- o The "servant mentality" of resort work is alleged by some social critics (e.g., Kent, 1975) to damage employees' self-esteem. However, there has been no published evidence to support this concern, and frequent interviews by Community Resources with resort personnel officers and union officials do not indicate that this has been a serious mental health problem.

Worker Satisfaction: In late 1986, the Council of Hawaii Hotels contracted with Strategic Information Research Corp. (1987) to survey hotel workers statewide. CRI requested results for selected items dealing with worker satisfaction; attitudes toward pay; and feelings about Mainland vs. Hawaii management and opportunities for promotion. The Council of Hawaii Hotels, which is involved in contract negotiations with Neighbor Island hotel unions as of this writing, agreed to provide these results on condition that no conclusions be drawn in the EIS text. Therefore, results are presented in Table V-27 without further comment.

TABLE V-27

## Hawaii Hotel Worker Attitudes Toward Their Jobs

|                                                                                                                   | <u>Agree/<br/>Yes</u> | <u>Disagree/<br/>No</u> | <u>No Opinion/<br/>Don't<br/>Know</u> | <u>(No<br/>Response)</u> |
|-------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|---------------------------------------|--------------------------|
| <u>Job Satisfaction, Pride</u>                                                                                    |                       |                         |                                       |                          |
| I like my job.                                                                                                    | 88                    | 5                       | 5                                     | 2                        |
| Most employees at my hotel don't like their jobs.                                                                 | 17                    | 51                      | 29                                    | 3                        |
| I am proud to work in the hotel business.                                                                         | 87                    | 4                       | 5                                     | 3                        |
| Most employees of this hotel have a sense of pride about their work.                                              | 71                    | 16                      | 9                                     | 3                        |
| <u>Attitudes toward Pay</u>                                                                                       |                       |                         |                                       |                          |
| I am paid fairly for the work that I do.                                                                          | 57                    | 34                      | 6                                     | 3                        |
| If I get tired of working in the hotel industry, I could easily find a job elsewhere in Hawaii that pays as well. | 28                    | 50                      | 18                                    | 4                        |
| <u>Local vs. In-Migrant Management</u>                                                                            |                       |                         |                                       |                          |
| Not enough people are promoted up through the ranks in my hotel.                                                  | 46                    | 30                      | 20                                    | 3                        |
| Supervisors who are not from Hawaii don't understand the needs of employees who are.                              | 55                    | 27                      | 15                                    | 3                        |
| More people from Hawaii should be advanced into higher managerial positions in my hotel.                          | 65                    | 14                      | 17                                    | 3                        |

(base: 5,267 statewide hotel employees)

Source: Strategic Information Research Corp. (1987) -- selected results provided by Council of Hawaii Hotels.

#### 1.2.7.2.2 Increased Visitor Population

The Hawaii State Department of Planning and Economic Development (1981), in its Tourism Plan Technical Reference Document, concludes that increased visitor population has implications for:

- o social interaction between residents and visitors;
- o perpetuation of local arts and handicrafts;
- o changes in lifestyle and standard of living;
- o erosion of "Aloha Spirit";
- o impaired resident access to coastal areas;
- o competition for public facilities and resources;
- o pressures on open space and agricultural lands;
- o cost of living and property values;
- o crime; and
- o population increases and need for employee housing.

This menu of potential positive and negative outcomes does not indicate which effects are more frequent or more important. Nor does it indicate what aspects of the visitor population (such as level of expenditure or demographic composition) could affect the nature of social impacts.

However, social scientists have devoted considerable time to identifying factors which affect resident-visitor relations, both in Hawaii (Knox, 1979; Liu and Var, 1984) and elsewhere (UNESCO, 1976; Knox, 1978; Graburn, 1983; Kendall and Var, 1984). These studies and various Hawaii surveys (Research Associates, 1974; Public Affairs Advisory Services, 1975; Ward Research 1982) found no relationship between real or perceived direct economic dependence on tourism and attitudes toward either tourists or the visitor industry (although entrepreneurs associated with tourism were more likely to have positive attitudes).

Rather, the studies indicate that resident attitudes have more to do with factors such as perceived competition for resources (e.g., beaches and transportation facilities), displaced political resentment, age of respondents, and perceptions of how much visitors respect local residents.

The quality of resident-visitor interaction in West Hawaii will likely also be affected by the extent of visibility for tourists and the situations in which they are encountered by local residents. The South Kohala Resort as planned will be a self-contained destination area similar to the current Mauna Kea, Mauna Lani, and Waikoloa resort areas. Research for past tourism social impact assessments (Community Resources, 1984, 1985) suggests that no more than about 15 percent of the visitor population at such resorts tours off-site in any given day. To the extent that such off-site visitor presence does not



interfere with important resident resources (such as recreational areas or transportation systems), it is unlikely to cause serious problems. Even here, a mitigating effect could be produced if off-site visitor activities are channelized into resident-operated tour or commercial activities, thereby increasing the proportion of residents who are likely to possess the positive attitudes of tourism entrepreneurs.

To the extent that increased visitor use of Hapuna Beach results in more perceived congestion or a feeling of "intrusion" on the part of local residents, there are negative implications for the quality of resident-visitor relationships in West Hawaii, at least for some groups of residents. Management and mitigation actions are discussed in Section 6.2 of this chapter.

#### 1.2.7.2.3 Increased Numbers of Resort Residents

As noted in Section 1.2.2 (Table V-8), the South Kohala Resort at build-out is projected to house an average 425 resort residents (some of whom would be part-time residents) -- about one-fourth of the total growth in West Hawaii resort resident population through the year 1998, according to the cumulative development scenario originally presented in Table V-5.

There has been little systematic study of the social impacts of such new residents. In community interviews conducted for the Princeville Phase II EIS (Belt Collins & Associates, 1983), CRI concluded that Phase I residents of that Kauai project were initially socially isolated from surrounding communities, but then gradually began interacting with other residents through senior citizen organizations and community affairs.

It may also be assumed that resort residents affect the political balance of the island through (1) a more conservative philosophy on average, and (2) a desire for improved public services and facilities in their areas. Such political impacts are likely to increase gradually in the future as resort residential populations continue to grow. However, the cumulative resident population figures in Section 1.2.2 suggest that resort residents would comprise less than ten percent of the anticipated growth in permanent population due to West Hawaii resort development, and so the social impacts associated with these residents are likely to remain minimal.

#### 1.2.7.2.4 Worker In-Migration and Related Population Change

In addition to job-related competition, other social impacts of population growth through in-migration are usually felt to consist of (1) strains on infrastructure and services (e.g., housing), with attendant social stress, and/or (2) social adjustment problems between newcomers and longtime residents (Hawaii State Department of Planning and Economic Development, 1981). However, there is frequent debate as to which of these two is more significant.

CRI has interviewed social service agency representatives throughout the state in conjunction with social impact assessments for proposed resort projects on Kauai (Belt Collins & Associates, 1983), rural Oahu (Community Resources, 1985), and West Hawaii (Community Resources, 1980, 1984, 1986). In these interviews, there was only occasional reference to serious social problems relating to conflicts between different types of people, but

frequent mention of family and individual stresses resulting from population booms and associated social strains -- particularly shortage of affordable housing. This findings is consistent with the major body of literature from outside Hawaii on sudden population growth in rural areas.

In-migrating new population could also have impacts on existing life-styles and cultural values, possibly in the direction of more "Mainland/urban" and less "local/rural". However, the extent to which this actually happens will depend on, among other things (1) the location of future new residential development (i.e., whether in-migrants are widely dispersed among existing communities or are concentrated in new communities); and (2) the actual demographics of the newcomers. While Maui and West Hawaii resort expansion in the 1960's and 1970's attracted mostly young Mainlanders, several major Neighbor Island resorts in the 1980's have made an effort to recruit Hawaii-born residents. Such targeted recruitment, as well as job training for disadvantaged West Hawaii residents to minimize need for in-migration, represent one of the major recommended forms of socio-economic mitigations (see Section 1.2.8).

Based on this available indirect evidence from Hawaii and elsewhere, CRI would conclude that social adjustment problems between longtime residents and newcomers represent a milder although lasting social impact, while the social costs of housing shortages and other strains on infrastructure usually form the more acute but short-term impact. The latter types of impact occur only in cases of very rapid growth. The heavy development scenario for 1994-1998 set forth in Table V-5 would certainly fall in this category, as might the impacts of the unusually large Hyatt Regency Waikoloa project.

#### 1.2.7.3 Statistical Indicators of Community Cohesion

To the extent that tourism causes the types of negative qualitative social impacts of which it is often accused, at least some indication should be found in statistical measures of:

- o crime data; and/or
- o juvenile arrests; and/or
- o family problems; and/or
- o individual mental health.

#### 1.2.7.3.4 Crime Data

It has frequently been alleged that resort development is linked with crime, and some studies using Hawaii data (e.g., Fujii and Mak, 1979; Fujii, Mak, and Nishimura, 1978, 1980) have established statistical associations between some measures of tourism and reported crime. Chesney-Lind and Lind (1984) used Kauai crime data from 1978 to 1980 in order to compare victimiza-tion for visitors vs. residents. In that period of time, results varied greatly depending on the type of crime. Overall, visitors were less likely to be crime victims than residents, although they were more likely to report a few particular types of crime (robbery, rape, and larceny -- the latter usually being thefts in public settings such as beach parks).

A prior resort social impact assessment (Community Resources Inc., 1985) has extensively analyzed both the Hawaii crime-tourism studies and several studies from outside Hawaii (Pizam, 1982; Jud, 1975; McPheters and Stronge, 1974). When all the study results are presented together, no definite pattern emerges. Crimes linked to tourism in one study have no association or even a negative association in another study, although there was some weak consistency in finding links between tourism and the particular crimes of robbery, rape, and larceny. However, police in rural Hawaii areas affected by tourism -- including the Kohala area -- say that the major crime impacts generated by resorts involve property crimes, primarily larceny at beach parks and other visitor attractions off-site from resort destination areas themselves.

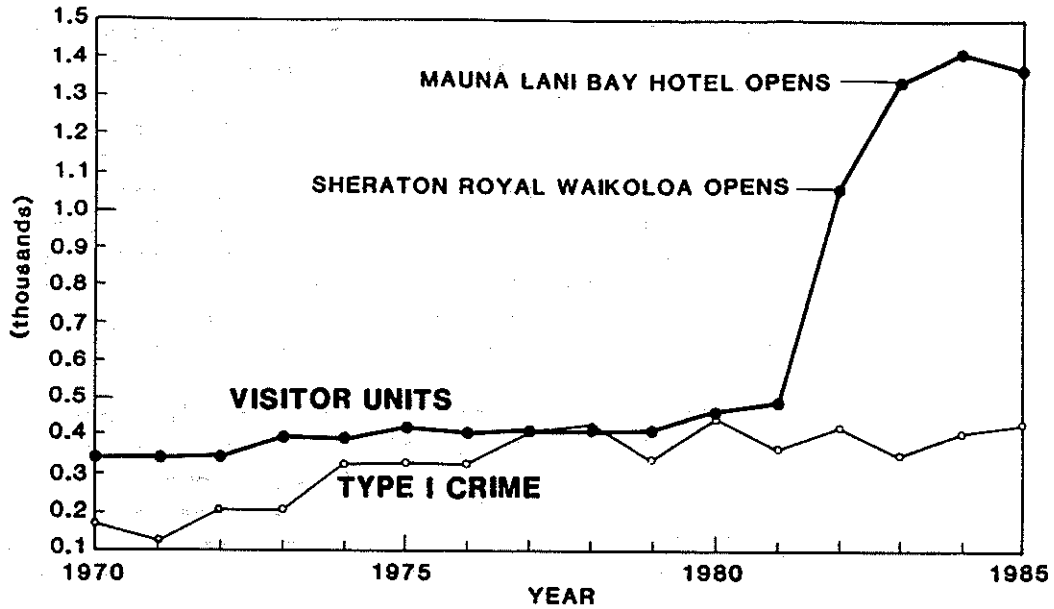
In an effort to determine whether reported crime has increased following construction of new hotels in the South Kohala area, CRI examined crime data from both the North and South Kohala districts (Hawaii County Police Department Annual Reports, various years). (NOTE: The ideal comparison would have involved crime rates vs. the ratio of visitors to residents in the area. However, for many years, there are no reliable estimates of resident population in Kohala, and so rates cannot be calculated.)

Figure V-3(a) plots number of Kohala visitor units against total reported "Type I" crimes, which include the major types of criminal violations. ("Type II" crimes are less serious and/or involve offenses such as drug abuse, for which reporting and arrests may vary greatly depending on different local policies.) While the number of visitor units increased sharply in the early 1980's (due to construction of the Sheraton Royal Waikoloa and the Mauna Lani Bay Hotel), there was no comparable increase in overall crime. Rather, the period during which reported crime rose most sharply was the early 1970's. While it is impossible to determine whether there was any cause-effect relationship, this was the period when the Kohala sugar plantation was phasing out and the economic future was particularly uncertain, at least for the North Kohala area.

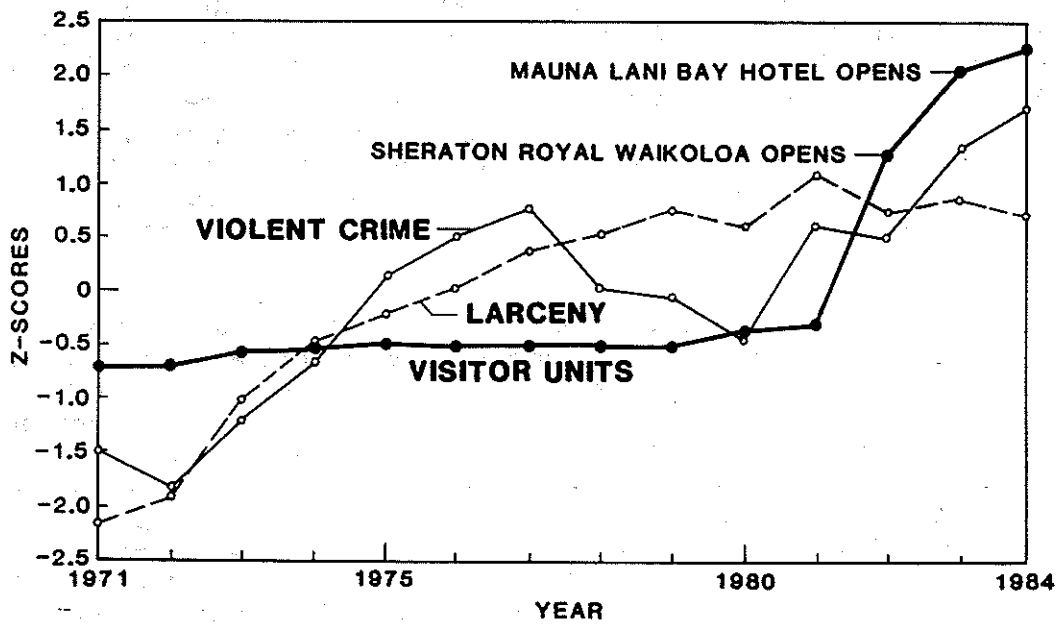
In Figure V-3(b), CRI also examined the relationship between visitor units and individual crimes often thought to be associated with tourism (rape, robbery, and larceny). The numbers of rapes and robberies in the Kohala area have been so few and so erratic as to be almost unplotable, and so total "Violent" crime (all reported murder, manslaughter, rape, robbery, and assault) is plotted instead. Because the number of individual crimes are so few in number compared to the numbers of visitor units, Figure V-3(b) uses standardized "Z-scores," a statistical transformation which makes the units comparable by expressing each number as a deviation from the mean for that variable. Also, for the crime data, Figure V-3(b) employs three-year moving averages to eliminate some of the "noise" from annual fluctuations and bring out any overall trends.

These graphs fail to show any clear relationship between new Kohala visitor units and reported crime of any type, whether total, violent, or simple larceny (theft). This does not conclusively disprove any link between crime and tourism in Kohala, since statistical relationships are complex and can be masked by other variables. However, it does illustrate that any such relationship (if it exists) is not a simple one, and that building new visitor units will not automatically lead to increased crime, except for expected increase as a function of increased population.

**A. VISITOR UNITS VS. TOTAL TYPE I CRIME (Raw Numbers)**



**B. VISITOR UNITS VS. VIOLENT CRIME AND LARCENY**



NOTE: To allow comparison on the same scale, raw numbers were transformed to Z-scores, and three-year moving averages were used for crime data.

**Figure V-3**  
**KOHALA AREA VISITOR UNITS VS.**  
**REPORTED CRIME, 1970-1985**  
 SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii      September 1987

### 1.2.7.3.2 Juvenile Delinquency

Figure V-4 plots Kohala visitor units against juvenile arrests in the South and North Kohala districts combined (Total Type I offenses, again using Z-scores to transform both variables to the same scale). According to the South Kohala police operations clerk (personal communication, Mrs. Patricia Lewi, April 24, 1987), the sharp spike in 1978 was due to several repeat offenders rather than to any increase in the overall number of offenders. She also noted that the upturn since 1983 has been associated with overall increased population and that juvenile offenders are increasingly members of newcomer, rather than longtime resident, families.

It is possible to interpret Figure V-4 as suggesting a delayed association between resort development and juvenile crime, since the upturn in North/South Kohala juvenile arrests followed opening of the Sheraton Royal Waikoloa and Mauna Lani Bay Hotel by several years. (Actually, the recent increased juvenile arrests coincide with a period of increased occupancies for all West Hawaii resorts, which could mean more visitors spilling over into South Kohala recreation areas, where juveniles are often responsible for minor thefts.) However, it is also apparent that known juvenile crime actually dropped in the years when the last two new Kohala hotels opened.

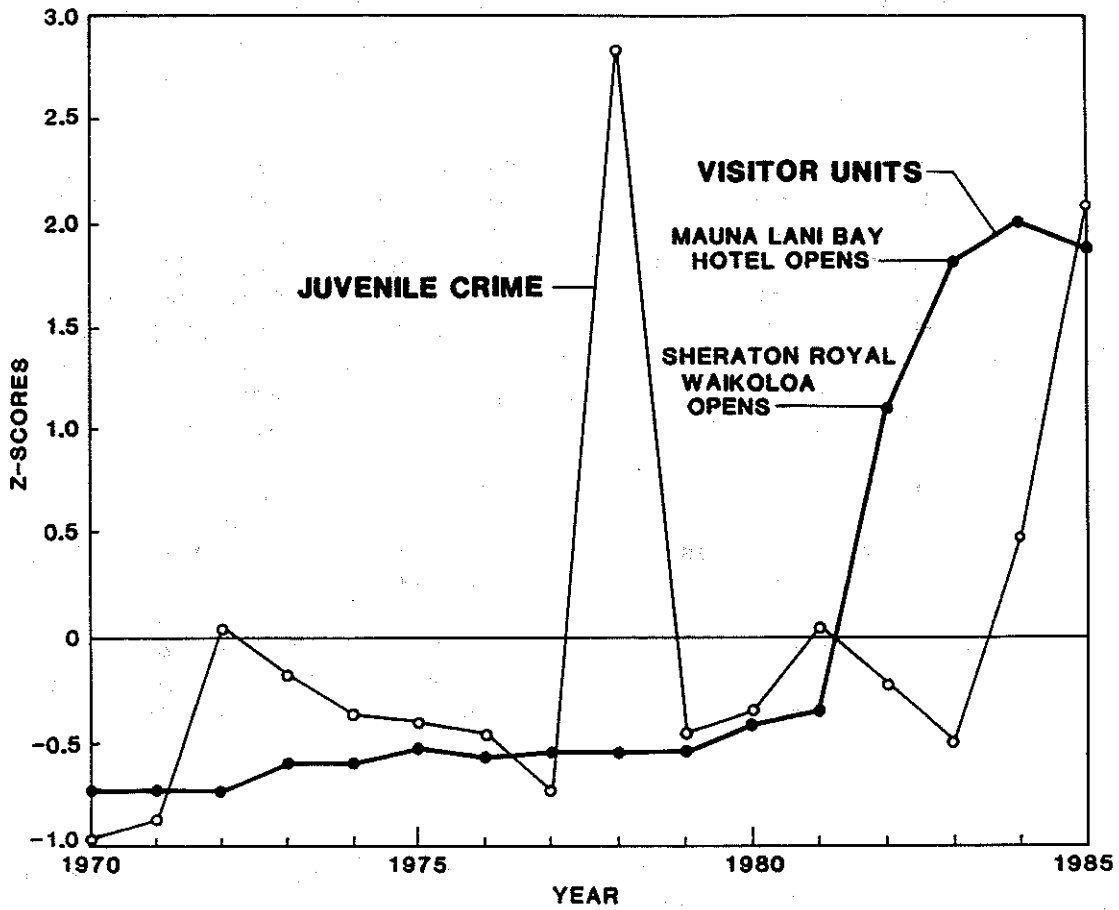
In past resort social impact assessments (Community Resources, Inc., 1984, 1985), police officers from Kohala and other rural resort areas throughout Hawaii have been quoted as saying that the major implications of tourism for juvenile delinquency involve (1) increased juvenile opportunities for thefts at beach parks or other public places, and (2) creation of a "street scene" in tourist commercial areas such as Lahaina or Kailua-Kona. Compared to independent hotels in semi-urban complexes, self-contained destination areas such as Mauna Lani contribute relatively little to the first of these factors and even less to the second.

### 1.2.7.3.3 Family Problems

As noted in Section 1.2.7.2.1, resort employment can theoretically contribute to marital discord or child care problems. The only district-level statistics on such problems relate to child abuse and/or neglect. Table V-28 shows statewide and Big Island data for child abuse/neglect since 1980 (when the State switched over to the record-keeping system currently employed).

Child abuse/neglect figures must be treated with great caution because (1) there has been a recent statewide (and national) increase in willingness to report cases, which does not necessarily mean actual increased abuse or neglect, (2) available figures may include repeated reports over time about the same families; and (3) reported cases are also partly a function of the number of caseworkers who are present to record the reports, and an organization of Kona parents recently prepared a report suggesting that -- due to staffing problems -- West Hawaii caseworkers have much higher caseloads than official State statistics would indicate (Families as Allies, 1987).

Given these caveats, it may be seen from Table V-28 that there has been a sharp islandwide increase in both reported and confirmed child abuse/neglect cases from 1980 to 1985. However:



**Figure V-4**  
**KOHALA AREA VISITOR UNITS VS. JUVENILE**  
**ARRESTS FOR TYPE I OFFENSES, 1976-1985**

Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii      September 1987

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

TABLE V-28

## Statewide and West Hawaii Child Abuse/Neglect Data, 1980 - 1985

| <u>STATEWIDE</u>                                    | <u>1980</u>   | <u>1981</u>   | <u>1982</u>   | <u>1983</u>   | <u>1984</u>    | <u>1985</u>    |
|-----------------------------------------------------|---------------|---------------|---------------|---------------|----------------|----------------|
| Reported:                                           | 2,104         | 2,358         | 2,681         | 3,631         | 4,378          | 4,234          |
| Rate/10,000 Residents:                              | 21.7          | 24.0          | 26.9          | 35.7          | 42.1           | 40.2           |
| Confirmed:                                          | 1,061         | 1,134         | 1,379         | 1,620         | 2,181          | 2,336          |
| Rate/10,000 Res.:                                   | 11.0          | 11.6          | 13.8          | 15.9          | 21.0           | 22.2           |
| <u>HAWAII</u>                                       |               |               |               |               |                |                |
| Reported:                                           | 214           | 209           | 288           | 371           | 477            | 521            |
| Rate/10,000 Res.:                                   | 23.0          | 21.5          | 28.8          | 36.0          | 45.0           | 47.7           |
| Confirmed:                                          | 83            | 91            | 111           | 155           | 233            | 279            |
| Rate/10,000 Res.:                                   | 8.9           | 9.4           | 11.1          | 15.1          | 26.0           | 25.6           |
| <u>HAWAII CENSUS TRACT REPORTS (CONFIRMED ONLY)</u> |               |               |               |               |                |                |
| 217 - S. Kohala<br>(as % of County:)                | 3<br>(3.6%)   | 0<br>(0.0%)   | 1<br>(.90%)   | 5<br>(3.2%)   | 13<br>(5.6%)   | 7<br>(2.5%)    |
| 218 - N. Kohala<br>(as % of County:)                | 1<br>(1.2%)   | 0<br>(0.0%)   | 0<br>(0.0%)   | 6<br>(3.9%)   | 7<br>(3.0%)    | 13<br>(4.7%)   |
| 215, 216 - N. Kona<br>(as % of County:)             | 22<br>(26.5%) | 14<br>(15.4%) | 14<br>(12.6%) | 56<br>(36.1%) | 65<br>(27.9%)  | 71<br>(25.4%)  |
| 213, 214 - S. Kona<br>(as % of County:)             | 7<br>(8.4%)   | 10<br>(11.0%) | 6<br>(5.4%)   | 10<br>(6.5%)  | 34<br>(14.6%)  | 20<br>(7.2%)   |
| 219 - Honoka'a/<br>Kukuihaele<br>(as % of County:)  | 6<br>(7.2%)   | 6<br>(6.6%)   | 3<br>(2.7%)   | 4<br>(2.6%)   | 10<br>(4.3%)   | 2<br>(.72%)    |
| TOTAL STUDY AREA<br>(as % of County:)               | 39<br>(47.0%) | 30<br>(33.0%) | 24<br>(21.6%) | 81<br>(52.3%) | 129<br>(55.4%) | 113<br>(40.5%) |

Note: Figures are for unduplicated abuse and/or neglect. However, cases reported on different days involving the same individual are listed as separate instances.

Source: Unpublished data, Hawaii State Department of Social Services & Housing. Rates per 10,000 residents calculated by Community Resources, Inc., based on on County population estimates from Hawaii State Department of Planning and Economic Development (1986).

- o the Big Island rates are essentially identical to statewide rates;
- o the total West Hawaii Study Area's share of confirmed cases islandwide has fluctuated greatly, ranging from 22 percent in 1982 to 55 percent two years later, and a downturn to 41 percent in 1985 (when visitor counts and tourism employment was on the rise);
- o Cases in South and North Kohala have begun to pick up in the mid-1980's, following construction of the most recent two hotels there. While no cause-effect relationship can be established at this time (and while it is uncertain whether any possible cause-effect connection would have more to do with tourism per se or with population increase and in-migration), the figures suggest that this is a topic worth further exploration and monitoring.

#### 1.2.7.3.4 Mental Health

According to the Chief of the Hawaii County Community Mental Health Center (personal communication, David Wrigley, April 24, 1987), an apparent recent "decline" in West Hawaii mental health caseloads actually reflects a reduced number of caseworkers and a more selective screening process. Therefore, it would be inappropriate to use the data for even tentative comparisons with tourism development in West Hawaii.

However, interviews with West Hawaii social service agencies (Community Resources, Inc., 1980, 1986) suggest that (1) any relationship between resort development and either individual or family stress probably has more to do with strains from population growth (e.g., having to "double up" in housing) than with tourism per se; and (2) newcomers are more likely than longtime residents to exhibit psychiatric symptomatology in response to stress -- partially due to lack of support networks and partially because Mainland-raised individuals are culturally more likely to internalize stress while many local residents vent their frustrations externally (i.e., fights, minor crime, family arguments).

Thus, cumulative resort development -- or any other form of economic development generating rapid in-migration -- can be expected to increase demands for mental health services, possibly somewhat out of proportion to population growth rates alone. As indicated in Section 2.2.9.1.4, this would depend to some extent on whether housing and other infrastructure is provided in a timely fashion. The Chief of the Hawaii County Mental Health Community Center states that his agency is now beginning to study this issue, although no planning is yet underway.

#### 1.2.7.3.5 Social Consequences of Unemployment

Preceding discussions of impacts from resort development and resort employment have not explicitly considered alternatives, which for some people -- particularly the educationally and culturally disadvantaged -- may still be unemployment.

There have been many studies nationwide which basically indicate that mental health problems are far more prevalent among the unemployed than among the employed, and that poverty is strongly associated with virtually all forms of mental illness.



Crime is a more complicated issue. While crime rates are higher in extremely poor areas, there is no apparent relationship between job loss and increased crime (Horwitz, 1984), and crime rates sometimes drop during economically troubled times.

However, in terms of family stability, other studies going back to the Great Depression, and more recent ones, have demonstrated extreme negative impacts of unemployment and financial crisis on family relationships. Child abuse has also recently been linked to unemployment (Steinberg, Catalano, and Dooley, 1981).

Thus, while resort employment -- like employment in any type of industry -- may have negative as well as positive sociological and psychological aspects, these aspects would generally be less problematic than impacts of widespread unemployment.

## **1.2.8 Socio-Economic Mitigations**

### **1.2.8.1 Purpose of EIS Socio-Economic Mitigation Discussions**

The term "mitigations" refers to actions which can be taken to reduce negative impacts (or enhance positive ones), whether these actions are taken by the developer, local government, or some other party.

If a definite commitment has been made by a developer or the government, the EIS would disclose this. However, it is also a purpose of the EIS to discuss possible actions, at least in a broad and preliminary way. That is because the actual method for deciding upon mitigations usually involves negotiated conditions attached to government land use approvals (and/or government budget decisions). The function of an EIS is to discuss matters relevant to these decisions, but not to pre-determine the outcome of the political negotiating process which leads to these decisions.

(It may be noted that all of Hawaii's county governments, including the Big Island's, are considering approaches to "Development Agreements," which would tie down developer commitments earlier in the process, and to "Impact Fees," which would bring more predictability to the dollar amount which developers would be expected to contribute to mitigations. In the meantime, the process remains one of negotiation, and the EIS must operate within this system.)

### **1.2.8.2 Steps to Maximize Employment for Current Residents**

To the extent that new resort jobs go to current residents of the Study Area (West Hawaii, including Hamakua), several social purposes would be served:

- o in-migration and attendant social stress would be reduced;
- o housing impacts would be reduced, since many workers would already be housed;
- o the West Hawaii tourism workforce would retain a culturally cosmopolitan make-up;

- o the purpose of economic "development" would actually be served, in the sense of improving quality of life for the disadvantaged and marginally employable.

As a secondary priority, efforts to maximize employment for current residents of East Hawaii would alleviate unemployment in that area. And as a third priority, recruitment among residents of other Hawaiian islands and/or among ex-Big Island residents now on the Mainland would help assure that in-migrants are socially compatible with current residents.

The basic method for maximizing employment among current residents is job training (in the broad sense, including such factors as basic education and attitudinal counseling), as well as support services such as child care or transportation assistance.

Individual hotels typically provide extensive training for their workers. However, in order to assure that more residents are hired in the first place, more basic job preparation education and training is required -- e.g., training in basic skills and work habits, vocational education, and job-specific occupational training. At higher levels, there is a need for human resource development to assure that area residents are competitive for managerial as well as staff positions. These efforts would necessarily be regional and/or islandwide, not limited to individual resorts.

Numerous existing agencies already provide training, education, and related services -- among them the State Employment Service, Alu Like (which successfully encouraged many off-island native Hawaiians to take jobs at the recently-opened Sheraton Princeville); Department of Education adult educational and high school vocational programs (although the State has yet to implement the long-discussed "Transition Centers," which would provide intensive vocational and career counseling, in any West Hawaii high schools).

On the statewide level, the 1987 Legislature authorized funding to staff the "Tourism Training Council," which will focus in large part on ways to ensure that Hawaii residents have the skills to take on supervisory and management positions. This Council, housed within the State Commission on Employment and Human Resources, recently published a discussion paper on "The Labor Demand and Supply Dilemma for Hawaii's Visitor Industry" (May 1987), suggesting some statewide strategies for assuring a supply of trained resident employees.

Perhaps the most involved agency on the local level has been the University of Hawaii at Hilo (UHH) West Hawaii Instructional Facility, which coordinates various course offerings from the UH/Manoa, the UH/Hilo, Hawaii Community College (soon to be replaced by a Vocational Studies Program within UHH), and the Center for Continuing Education and Community Services (CCECS). The current focus of West Hawaii programs has been on upgrade training, although CCECS in the future will begin to place more emphasis on entry-level job training (personal communication, CCECS director Judith Kirkendall, April 25, 1987). A "Hotel Operations Program" (encompassing current culinary arts courses, plus front desk operations) will soon be offered.

On the private-sector side, the Big Island chapter of the Hawaii Hotel Association has taken the lead in organizing input to West Hawaii college

course planning. This group also recently decided to expand its relationship with area high schools, increasing the visibility and effectiveness of such programs as Career Days, Career Shadowing, student hotel tours, liaison with principals and counselors, etc.

Thus, there appears to be little need to create new agencies to provide services. However, numerous private comments to CRI in the course of resort assessments throughout rural Hawaii (including but not limited to West Hawaii) suggest a possible need for better communication and coordination among existing agencies. This need may increase in the future as West Hawaii's population expands and current patterns of loose, informal communication becomes less efficient.

Therefore, socio-economic consultants CRI recommend that consideration be given to regional efforts focusing on:

- o improved coordination of existing education/training resources;
- o job awareness outreach and education programs (both on-and off-island);
- o feasibility studies on managerial modifications to accommodate local cultural aspects;
- o increased attention to entrepreneurial development programs;
- o child care programs;
- o employee transportation assistance.

Table V-29 relates these potential actions to several of the major potential labor supply sources for future West Hawaii development. Some additional comments on each component:

Improved Coordination of Existing Training/Education Programs: A significant question is: Who will assume the responsibility for such coordination? Resort developers in isolated rural areas such as Turtle Bay on Oahu (Kuilima Development Company and North Shore Career Training Corporation, 1986) and Punalu'u on the Big Island (Phillips Brandt Reddick, 1986) have tentatively outlined yet-to-be-implemented job training programs which could be coordinated by these resort developers (and/or associated hotel operators) themselves.

However, the situation in West Hawaii differs from that in the foregoing areas, where one resort might emerge as the principal employer for a fairly large surrounding area. In West Hawaii, there are numerous destination areas and numerous hotel operators. Hotels compete with one another for labor supply, and there is some history of disagreement between operators and developers as to who should bear responsibility for matters such as training or employee transportation assistance.

Therefore, it is recommended that -- if a coordinated program is to be designed -- government must take the lead (although with appropriate input from community organizations and resort interests). Possible agencies might include the County Office of Housing and Community Development, the Managing

Table V-29  
Labor Supply Mitigation Measures Related to Potential Sources

("XX" represents major potential linkage; "X" represents some linkage.)

|                                                     | Improved<br>Coordination<br>of Existing<br>Training/<br>Education<br>Programs | Job Awareness<br>Outreach and<br>Education<br>Programs | Managerial<br>Modifications<br>to Accommo-<br>date Cultural<br>Aspects | Entrepren-<br>eurial<br>Development<br>Programs | Child Care<br>Programs | Employee<br>Transporta-<br>tion<br>Programs |
|-----------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------|------------------------|---------------------------------------------|
| <u>Sources Currently in Study Area</u>              |                                                                               |                                                        |                                                                        |                                                 |                        |                                             |
| Future high school graduates                        | X                                                                             | XX                                                     |                                                                        | XX                                              |                        | X                                           |
| Females                                             | X                                                                             | X                                                      |                                                                        |                                                 | XX                     | X                                           |
| Underemployed (less than full-time workers)         | XX                                                                            | X                                                      |                                                                        |                                                 |                        | X                                           |
| Attitudinally or culturally disinclined             | X                                                                             | XX                                                     | XX                                                                     |                                                 |                        |                                             |
| Educationally disadvantaged                         | XX                                                                            | X                                                      | X                                                                      |                                                 | X                      | X                                           |
| Elderly                                             | X                                                                             | XX                                                     |                                                                        |                                                 |                        | X                                           |
| Handicapped                                         | X                                                                             | X                                                      |                                                                        |                                                 |                        | XX                                          |
| <u>Sources Not Currently in Study Area</u>          |                                                                               |                                                        |                                                                        |                                                 |                        |                                             |
| East Hawaii residents                               |                                                                               | XX                                                     |                                                                        |                                                 |                        | XX                                          |
| Inmigrants from other islands                       |                                                                               | XX                                                     |                                                                        |                                                 |                        |                                             |
| Filipino or other immigrants joining local families |                                                                               | X                                                      |                                                                        |                                                 |                        | X                                           |
| Former Island residents                             |                                                                               | XX                                                     |                                                                        |                                                 | XX                     |                                             |

Source: Community Resources, Inc.

Director's office, the Planning Department, the State Department of Labor and Industrial Relations, or any of the educational agencies previously mentioned.

Job Awareness Outreach and Education Programs: On-island efforts would be primarily focused on pockets of potential workers who might not readily consider resort employment without some campaign to attract them (e.g., the elderly); exposing students to resort work; and correcting misperceptions in the general public which can lead to negative attitudes toward resort work. Substantial community input would be needed on the latter point to assure that informational campaigns are factual and are not perceived as propaganda.

Off-island campaigns to attract former Big Island residents or workers from Oahu (rather than out-of-state) represent a somewhat more tentative suggestion, since they may also attract job-seekers other than the target population. Word of mouth may ultimately prove most effective. However, the possibility of some programs (such as active recruitment on Oahu high school and community college campuses) merits further study.

Changes in Management to Accommodate "Local" Culture: As discussed in Section 1.2.7.2, there are often concerns about cultural value differences between Mainland or Japanese hotel managers and local Hawaii residents, particularly those whose value systems include strong preferences to group approaches to work problems and aversion to competitive, individualistic work practices.

A number of new approaches to education developed by the Kamehameha Schools could theoretically be transferred to the workplace, in the form of greater involvement of entire family groups at work, an emphasis on achievement through group rather than individual incentives, and some de-emphasis on typical Western hierarchical approaches to supervision. To an extent, these were incorporated in Hawaiian plantation and cattle ranch management styles, and may be applicable to resorts as well. However, it is also possible that they would be most successful in smaller businesses oriented to visitors (below).

Entrepreneurial Development Programs: The recent proliferation of visitor-oriented businesses (both retail and recreational activities) in places such as Kona, Hanalei, and West Maui illustrate that tourism's economic opportunities are not limited to wage positions in hotels. The challenge is to assure that such opportunities are maximally known to, and taken advantage of by, West Hawaii residents -- particularly students making career decisions and former residents who may be attracted home readily by business opportunities than by hotel jobs. Agencies such as the County Office of Research and Development, the Hawaii County Economic Opportunity Council, Hawaii Island Economic Development Board, Alu Like, and the Hawaii Entrepreneurship Training and Development Institute would be logical contributors.

Child Care Programs: As discussed in Section 1.2.4, mothers with young children at home have substantially lower labor force participation rates than do mothers of older children. It may be assumed that child care would be a particular concern for females among the educationally disadvantaged, as well.

While recent resort approvals on Oahu have included requirements for land to be used for child care facilities, it is possible that the greater need (in light of existing private-sector day care operations) is for new services, such as coordination of independent babysitting services. Resort employees are often scheduled to work evening and weekend shifts, and their most acute needs may be for temporary babysitting assistance or drop-in child care at those times, rather than the usual Monday-Friday "day care." Such needs may be met most economically by groups of hotels either working with professional child care providers or simply keeping lists of babysitters and setting up "hotlines" so that employees could provide reciprocal sitting services for one another.

Employee Transportation Assistance: Currently, several South Kohala hotels subsidize worker ridership on County buses. However, the long-term stability of this arrangement is in some doubt. The program could be logically evaluated in the broader context of all the foregoing efforts to increase labor force participation.

Supervisory Upgrade: The foregoing components are primarily focused on ways to increase the proportion of entry-level jobs which would be taken by current or former residents, as opposed to in-migrants with few social ties to the island. However, once residents possess jobs, many would require a sense of opportunity for upward mobility if they are to remain in the jobs.

The prospect of a series of hotel openings over the coming 15 to 20 years would provide "stepping stones" for continual job advancement. While no individual hotel may be expected to train its workers for a better job at a competing new hotel, an ongoing regional training program would be in an excellent position to assist workers in developing needed skills. The University system is already focusing on this objective.

### **1.2.8.3 Provision of Housing for Employees and New Residents**

Historically, the County of Hawaii has required resort developers to provide employee rental housing and/or subsidized for-sale housing as a condition of land use approvals. The exact unit requirement is sometimes imposed at the time of the land use approval and sometimes postponed until just before the hotel opens (on the theory that actual housing need can be more accurately determined closer to the time of hotel opening). For example, the previous tentative approvals for the South Kohala Resort required a developer-sponsored housing study as the basis of final negotiations with the County over the ultimate requirement.

Mauna Kea Properties has stated its intention to expand the existing Kawaihae Village development to satisfy whatever State and County requirement may be imposed. Original Mauna Kea developer Laurance Rockefeller initiated this development in the late 1960's, prior to the era of government employee housing requirements. Of 67 units developed, 49 single-family and townhouse units were sold under State Act 105. (At the time, few Mauna Kea employees were interested in purchasing them, since most workers already owned housing in the area.) The remaining 16 units are apartments, still owned by Mauna Kea Properties and rented out, with first preference to Westin Mauna Kea employees.

The initial development utilizes only 12 acres of the total 33-acre Kawaihae Village site, and the roadway and water systems were designed to accommodate build-out of the additional 21 acres. The area has a sewage treatment plant and is zoned RM-5 (multi-family residential, with lot areas averaging at least 5,000 square feet per unit).

Following are additional possible housing actions suggested by socio-economic consultants CRI:

Government Measures to Assure Land Availability for Private-Sector Housing Development: State and County officials are planning the development of approximately 3,500 units at Kealakehe, and there has been longstanding general discussion of the possibility of government action to develop some similar "support community" in South or North Kohala.

However, of the approximately 15,000 housing units now existing in West Hawaii, most were privately developed in response to market conditions. As discussed in Section 1.2.6, private-sector housing initiatives historically have kept pace with resort unit development (although residential housing costs are increasing, as they are throughout the state). The primary measures by which local government affects private-sector housing supply are (1) development of regional infrastructure (roads, water, sewer lines, etc.), and (2) provision of zoned lands.

Infrastructure provision represents perhaps the major challenge to continued construction of affordable housing in West Hawaii, since much of the cost of housing development rests in factors such as water and sewer lines. Government provision of main lines would greatly increase the cost-effectiveness of residential developments which can then hook up to the main lines.

In addition, government has the discretion to waive certain requirements and standards as a way of encouraging the development of affordable housing and keeping the cost of these projects down.

The County of Hawaii is now examining different alternatives to the difficult question of financing the infrastructure and of finding ways that new developments, and not just existing residents or businesses, can shoulder this cost. The following is a list of possible alternative solutions, not specific recommendations:

- o Government bonds tied to revenues resulting from the value created by new resort development.
- o Negotiated "exactions" from developers -- Requirements of cash or in-kind contributions may be imposed as conditions of land use approvals.
- o Impact fees, an approach which involves predictable formulas for assessing new developments based on pro-rata shares of usage of specified new infrastructure specifically created to serve the various developments which are assessed.
- o User fees levied on individual consumers (e.g., users of water or sewage services) over time, rather than on developers on an up-front basis.

- o Improvement districts established to permit a special tax levy on property owners benefitting from specific public improvements within the district, with assessments based on street frontage or acreage. A variation is the "special district," which involves government bodies separate from the local government.
- o Tax increment financing, which involves earmarking increased tax revenues resulting from a new development to repay public expenditures (or bonds) used to provide infrastructure. The new development in effect pays its own way, using the community's normal tax program as the mechanism for deriving revenues.

Providing residentially-zoned land: Both the current and the draft revised Hawaii County General Plan provide various locations for urban expansion. Therefore, provision of residentially-designated land is not seen as a major problem, assuming (1) that actual zoning of designated lands is timely, and (2) government is willing to designate future lands as market conditions warrant.

Private-Sector Employer Measures to Assist Employees: Increasing supply of housing does not always address the broader community question of "housing for whom?" To assure that resort workers are among the beneficiaries of new housing development, resorts or other major employers could take certain cost-effective steps to help their workers find market housing, both owner-occupied and rentals.

Counseling -- During the construction and start-up phases of a resort, employee housing counseling may provide an efficient way to assure adequate quarters for resort workers.

In conjunction with its work on the Hyatt Regency Waikoloa, Hawaiian Dredging and Construction Company has retained the services of a real estate firm to find housing for its construction workers and subcontractors. While the magnitude of the South Kohala Resort hotel construction will be much less than that for the Hyatt, a similar approach could provide a smooth and timely integration of South Kohala Resort construction workers into the community.

Implementing such a program during initial staffing of the hotel would provide housing information and assistance to both newcomers and also long-time residents seeking new housing. Even after the start-up phase, the occasional services of a real estate agent for employees could be offered.

Employee notices -- The simplest way to provide housing information is through the systematic and institutionalized use of employee notices, through posting on employee bulletin boards or announcements published in an employee newsletter. Employees would thus be encouraged to advertise for roommates or to share their knowledge of imminent housing opportunities, so that other employees would have the advantage of first notice. A program of this nature is most suitable once a resort is in full operation and start-up housing concerns have been addressed.



#### 1.2.8.4 Ongoing Community-Resort Communication Mechanisms

Currently, all resort developers and most individual hotel operators maintain separate community relations departments or programs. Kohala-area resorts have made significant contributions to the overall community welfare, such as land for a fire department sub-station at Mauna Lani, development of the Lalamilo water system, and Westin Hotels' cash contribution of \$5 million to improve hospital facilities at Waimea. Resort personnel are generally active in community organizations, and community leaders not affiliated with resorts are usually consulted as new plans are formulated.

However, a possible addition to these activities could involve creation of an ongoing forum to promote regular communication between resorts and residents. The value of such a forum would rest largely in the opportunity for residents to pose questions and express concerns to the resorts, rather than only reacting to proposals for new development.

Several Hawaii precedents exist for such efforts:

- o On Oahu, the Kuilima (Turtle Bay) Resort developers have met monthly or bi-monthly for more than three years with a "Kuilima/North Shore Strategy and Planning Committee." Meetings are open to the entire community. This committee is now in the process of becoming a permanent nonprofit corporation, and it will have several seats on the board of directors for the job training and child care programs being funded by the developer. Various subcommittees have recently been formed to explore particular topics of common concern to both the resort and the wider community (e.g., transportation, beach access, park design), as well as to publicize issues and activities in local community media.
- o More recently, also on Oahu, participants in the Ko Olina (West Beach) resort development have agreed to provide funding for an economic development master plan for Waianae Coast communities. Part of this effort involves establishing a Waianae Coast Communities Advisory Committee (headed by Kenneth F. Brown of Mauna Lani Resort and comprised of prominent Honolulu business and political leaders). This committee is to meet with and advise a Waianae resident group interested in developing alternative small-scale forms of economic development.

In the Kohala area, the South Kohala Resort Advisory Committee provides an example of a standing communication mechanism between the community and one resort development.

Still lacking, however, is a regular forum for communication between residents and all area resort developers. To date, such a forum has not been necessary, due to the slow pace of resort development. However, in the future, the South Kohala Resort Association (consisting of representatives of all developers and hotels) could provide the nucleus for regular meetings -- whether once a month or once a year -- in which resort businessmen and community residents could jointly explore ways to manage impacts of resort development and population growth. The exact format of such meetings would need to be determined by experimentation, since factors such as community polarization and domination by particular groups would have to be considered.

### 1.2.8.5 Management-Oriented Research

Depending on the exact level and rate of cumulative resort development in West Hawaii, the key socio-economic impact issues will have less to do with forecasting impacts than with managing them. In order to do this effectively, a number of applied research projects would be useful, including:

- o An islandwide study of Hawaii County's unemployed and other potential labor force entrants -- their numbers, characteristics, willingness to move to other parts of the island, and factors affecting that willingness.
- o An ongoing tracking system to monitor changes in the West Hawaii resort and/or general workforce profiles.
- o Survey data to provide more solid quantitative evidence about the true extent and magnitude of any family impacts connected directly with tourism employment or indirectly through rapid population growth.

For the most part, such studies would be appropriately carried out by government. One possible vehicle might be the new "Tourism Impact Management System" which the 1986 State Legislature placed in the Hawaii State Department of Planning and Economic Development. At present, the effort is limited to initial data collection and an upcoming resident opinion survey, but the nucleus exists for a variety of other applied research and management activities suggested in a consultant report to the State (Coopers and Lybrand, 1986).

The overall concept of an impact management system represents a significant opportunity for government and the private sector to obtain information useful for future planning in West Hawaii. However, if the proposal is implemented beyond the current beginning phase, it is recommended that the County and interested visitor industry representatives lobby for several measures:

- (1) While the State's initial priority is going to an opinion survey among the general population, priority in West Hawaii should also go to profiling and surveying resort workers on a periodic basis, to determine whether or not longtime residents are receiving maximal economic benefits.
- (2) The Coopers and Lybrand approach ruled out analysis of indirect tourism effects through population growth. However, these are perhaps the most crucial for managing West Hawaii's future and should be included in the system.

Another major government initiative is the \$50,000 study just funded by the 1987 State Legislature to assess possible "barriers to training and employment" (including need for such things as child care, transportation, education, and basic skills) which could prevent current Leeward Oahu residents from receiving the benefits of planned new employment opportunities at West Beach and the Ewa "Second City." Results of such a study would presumably apply in large part to longtime residents of West Hawaii as well.

## 1.2.9 Fiscal Impacts

The fiscal impact analysis for the South Kohala Resort project, conducted by Environmental Capital Managers, Inc. (ECMI), focused on estimating the potential monetary benefits that would accrue to workers, businesses, and government as a result of the proposed development. Like any economic activity, South Kohala Resort will increase the burden on available public resources, and the objective of the analysis was to determine whether the additional government revenues generated as a result of the project would be sufficient to offset the additional costs incurred.

### 1.2.9.1 Study Parameters and Assumptions

**Visitor Expenditures.** The following set of assumptions was used to estimate the expenditures that could be attributed to South Kohala Resort guests:

|                            |       |
|----------------------------|-------|
| Occupancy                  | 70%   |
| Average party size         | 1.9   |
| Average daily expenditures |       |
| Japanese                   | \$230 |
| Non-Japanese               | \$ 90 |
| Visitor distribution       |       |
| Japanese                   | 20%   |
| Non-Japanese               | 80%   |

Based on these assumptions, the 350-unit hotel will yield annual expenditures of \$20.1 million (1987 dollars). If some or all of the residential units are used by non-local transient households (i.e., visitors from other islands, the mainland, Japan, etc.), and if these transients exhibit similar characteristics as the hotel users, then additional tourist expenditures would be generated, with an estimated maximum of \$32.1 million per year.

**Study Time Period.** The start year for the project was assumed to be 1991, and the end year, 2006. This latter date was chosen so that several years of operation could be considered in the analysis. For the purposes of the study, the base period was set at 1987, to maintain comparability with other base studies.

**Discount Rate.** A 10 percent discount rate was selected to convert all the revenue and cost flows estimated to occur during the study period into a common value. This rate represents the estimated average rate of return for private investments before taxes and after inflation, as prescribed by the U.S. Office of Management and Budget in Circular No. A-94, dated March 27, 1972.

**Time Schedule.** It was assumed that resort construction will begin in 1991 and that the hotel, golf course, and recreational amenities will be operational by 1993. For purposes of cash flow timing, multi-year activities (such as hotel construction) were averaged among those years, unless otherwise specified by the project's development schedule.

**Operational Employment.** Estimates of direct employment made by Community Resources, Inc. were adopted for the fiscal analysis. It was assumed that all positions will be in place at the end of the construction period.

**Revenue and Cost Variables.** Those financial impacts likely to exert a significant impact on public sector revenues and costs were estimated. A variable was selected if a significant change was likely to occur as a direct result of the project, all other things being equal. If it was determined that a change was likely to produce a significant impact, its incremental amount was then estimated and fully charged to the project in order to calculate the revenue-cost ratio.

#### 1.2.9.2 Output and Income Effects

ECMI used the State of Hawaii, Department of Planning and Economic Development input-output model to project impacts on the economy as a result of the South Kohala Resort development. The model shows inter-relationships among all sectors of the State's economy. An application of the model is the formulation of output, income, and employment multipliers which can be applied to estimate direct, indirect, and induced impacts of a given project. The direct effect is the immediate primary impact of a project on the economy, the indirect effect is the secondary impact (when establishments which cater to visitors purchase goods and services for their operations), and the induced effect is the subsequent round of changes in the economy (when employees or owners of businesses catering to visitors spend their earnings).

Employment effects were not included in the analysis; see Section 1.2.3 in this chapter. The output and income effects shown below are the relative magnitudes of impact if the proposed resort is constructed as planned and becomes fully operational. Due in part to the inherent assumptions built into the State input-output model and various estimation errors, the results should be viewed as estimations and not as predictions.

**Output Effects.** The impacts here represent the changes that could occur to the Gross State Product, or the effect on the total value of goods and services produced within the State's economy.

Upon full operation of the hotel, it is estimated that the 350-room hotel and related facilities will generate an annual average of \$43.2 million, in constant 1987 dollars. The indirect and induced effects have been calculated using the following multipliers for the hotel industry:

|          |       |
|----------|-------|
| Indirect | 0.453 |
| Induced  | 0.779 |

Based on these multipliers, the various effects are estimated as follows:

|          |                     |
|----------|---------------------|
| Direct   | \$34.2 million      |
| Indirect | 19.6 million        |
| Induced  | <u>33.7 million</u> |
| TOTAL    | \$96.5 million      |

**Income Effects.** This impact represents the income changes that could occur to the household sector of the economy. The various effects have been calculated using the following multipliers for the hotel industry:

|          |       |
|----------|-------|
| Direct   | 0.369 |
| Indirect | 0.167 |
| Induced  | 0.314 |

The income effects, shown below, have been calculated using these multipliers with the estimated direct output estimate of \$43.2 million.

|          |                     |
|----------|---------------------|
| Direct   | \$15.9 million      |
| Indirect | 7.2 million         |
| Induced  | <u>13.6 million</u> |
| TOTAL    | \$36.7 million      |

### 1.2.9.3 Public Revenue-Cost Analysis

ECMI first identified the kinds of revenue and cost elements to be considered, then estimated the dollar amount which should be associated with each element, and finally compared the discounted present values of the various revenue and cost totals. The objective of the analysis was to determine whether additional County and State government revenues generated as a result of South Kohala Resort will offset the necessary additional governmental costs.

#### 1.2.9.3.1 Study Variables

The following is a list of the public revenue and public cost variables which will produce financial impacts on public sector revenues and costs.

##### Public Revenue Variables:

**General Excise/Development.** This variable was included to reflect the revenue generation that will occur as a result of the development/construction activities. The contractor will be levied a 4 percent general excise tax. It is estimated that the total development will cost approximately \$328.5 million in 1987 dollars.

**General Excise/Operations.** The rental income derived from the operations of the hotel and transient-use condominiums will be assessed the general excise tax of 4 percent.

**General Excise/Personal Consumption.** This variable reflects expenditures from wages earned and their addition to the State's general revenue fund. It was assumed that the average employee will spend 60 percent of his/her gross income on consumable goods and services.

**Corporate Income Tax/Development.** The net taxable income derived from development of the project will be subject to the following corporate income tax: 4.4% on the first \$25,000 of taxable income, 5.4% on the next \$75,000 of taxable income, and 6.4% on all income over \$100,000. It was assumed that 10 percent of the estimated income generated by the project will be subject to this tax.

**Personal Income Tax.** For the fiscal impact analysis, the following assumptions were made: (a) each employee represents an individual household and each is the sole wage earner for that household, and (b) each household will claim an average of three exemptions and claim the standard deduction rather than itemize. The average income used was based on information provided by Community Resources, Inc.

**Real Property Tax.** The reclassification and rezoning of the property will increase the relative value of the land, and the improvements (estimated to total \$328.5 million) will also have value. The net change in land value from the existing class was estimated and included in the analysis.

**Hotel Room Tax.** Hotel room rentals are subject to a five percent tax. The study assumptions included a 70 percent occupancy rate and an average room rate of \$200 per night.

#### **Public Cost Variables:**

**Lower Education.** The projected increase in population may increase public education costs if additional teachers, supplies, etc. are needed beyond the level currently being planned. It is uncertain whether the incremental cost will rise proportionately with the additional population. Since in-migration of the labor force will be required to staff the resort operations, an average cost allocation to the project was made.

**Higher Education.** Likewise, an increase in the number of households in the area will probably increase demands on higher education services. For purposes of the study, the average costs for the major elements of the University of Hawaii at Hilo were charged to the project.

**Health Services.** This variable includes emergency medical services and the hospitals at Honoka'a, Kohala, and Kona. The average cost was estimated to be \$104 per person on the basis of the de facto population, since hotel guests may require emergency medical care.

**Mass Transit Services.** Hotel guests and residents are unlikely to use public transportation services; however, it is expected that some employees will commute to work by bus. An average variable cost of \$5 per (de facto) person was used in the analysis.

**Police and Fire Services.** These variables were included because the employment created through the project will potentially add to the workload. For police services, an average variable cost of \$101 per person was assessed to the aggregate employee-household. For fire protection services, it was estimated that the average variable cost per employee household would be \$56.

#### **Excluded Variables:**

Certain variables were excluded from this analysis, such as highway construction and maintenance, airport expansion, and utilities. Although these variables may be affected by the project, they are funded through user fees which keep the providers of these services and facilities solvent. Capital improvement projects funded directly through bond issues were also excluded since the costs are paid through these special funds. Thus, inclusion of these costs, along with the assessed user fees, would result in a "wash."

1.2.9.3.2 Results of the Present Value Revenue-Cost Analysis

As shown in the table below, South Kohala Resort is expected to have a favorable revenue-cost ratio of 9.3 to 1.0. This indicates that an additional \$9.30 in public revenue will accrue to the State of Hawaii and/or the County of Hawaii for every dollar of public cost caused by the project. (Note that this table represents the discounted cash flow for the study period of 1991-2006.)

Revenue-Cost Analysis Summary  
(in 1987 dollars)  
South Kohala Resort  
1991-2006

| <u>Variable Description</u>             | <u>Present Value</u> |               |
|-----------------------------------------|----------------------|---------------|
| General Excise Tax/Development          | \$ 6,406,828         |               |
| General Excise Tax/Operations           | 11,518,034           |               |
| General Excise Tax/Personal Consumption | 864,506              |               |
| Corporate Income Tax/Development        | 1,025,475            |               |
| Corporate Income Tax/Operations         | 5,529,042            |               |
| Personal Income Tax                     | 832,812              |               |
| Real Property Tax                       | 12,046,241           |               |
| Hotel Room Tax                          | <u>3,440,963</u>     |               |
| PUBLIC REVENUES                         |                      | \$ 41,663,901 |
| Lower Education                         | \$ 1,557,287         |               |
| Higher Education                        | 1,026,908            |               |
| Health Services                         | 731,861              |               |
| Mass Transit Services                   | 36,965               |               |
| Police Services                         | 714,266              |               |
| Fire Services                           | <u>396,758</u>       |               |
| PUBLIC COSTS                            |                      | \$ 4,464,045  |
| REVENUE-COST RATIO                      |                      | 9.3 to 1.0    |

The revenue-cost ratio is high due to the nature of the project, which includes both hotel and residential development. Much of the tax revenue will be generated during the early years of the study period from construction activity, as well as from real property, general excise, and hotel room taxes. On the other hand, additional operating costs of public agencies will be fairly constant throughout the period.

In the analysis, the cumulative discounted public revenues totalled almost \$41.7 million in constant 1987 dollars. Of these variables, the combined variables in the general excise tax category were estimated to contribute over \$18.8 million, or 45 percent of the total. Real property tax was the second largest variable, accounting for almost 29 percent of the total.

The cumulative discounted public costs totalled \$4.5 million in constant 1987 dollars, with the higher and lower education variables accounting for 58 percent of the total.

## 2.0 TRANSPORTATION FACILITIES

### 2.1 TRAFFIC IMPACT ANALYSIS

#### 2.1.1 Introduction

##### 2.1.1.1 Scope of Analysis

The proposed South Kohala Resort is only one among several resort facilities and other developments planned for the West Hawaii region, and estimates of its impact on transportation facilities and traffic must be conducted with this in mind. It should be noted, however, that long-range forecasts are only as good as the development scenarios on which they are based. To the extent that the rate of development exceeds or falls short of that which is planned, traffic volumes may also increase more rapidly or more slowly than projected. Therefore, it is useful to treat the following discussion as an indication of potential problems that may arise in the future rather than an attempt to specify exact timetables.

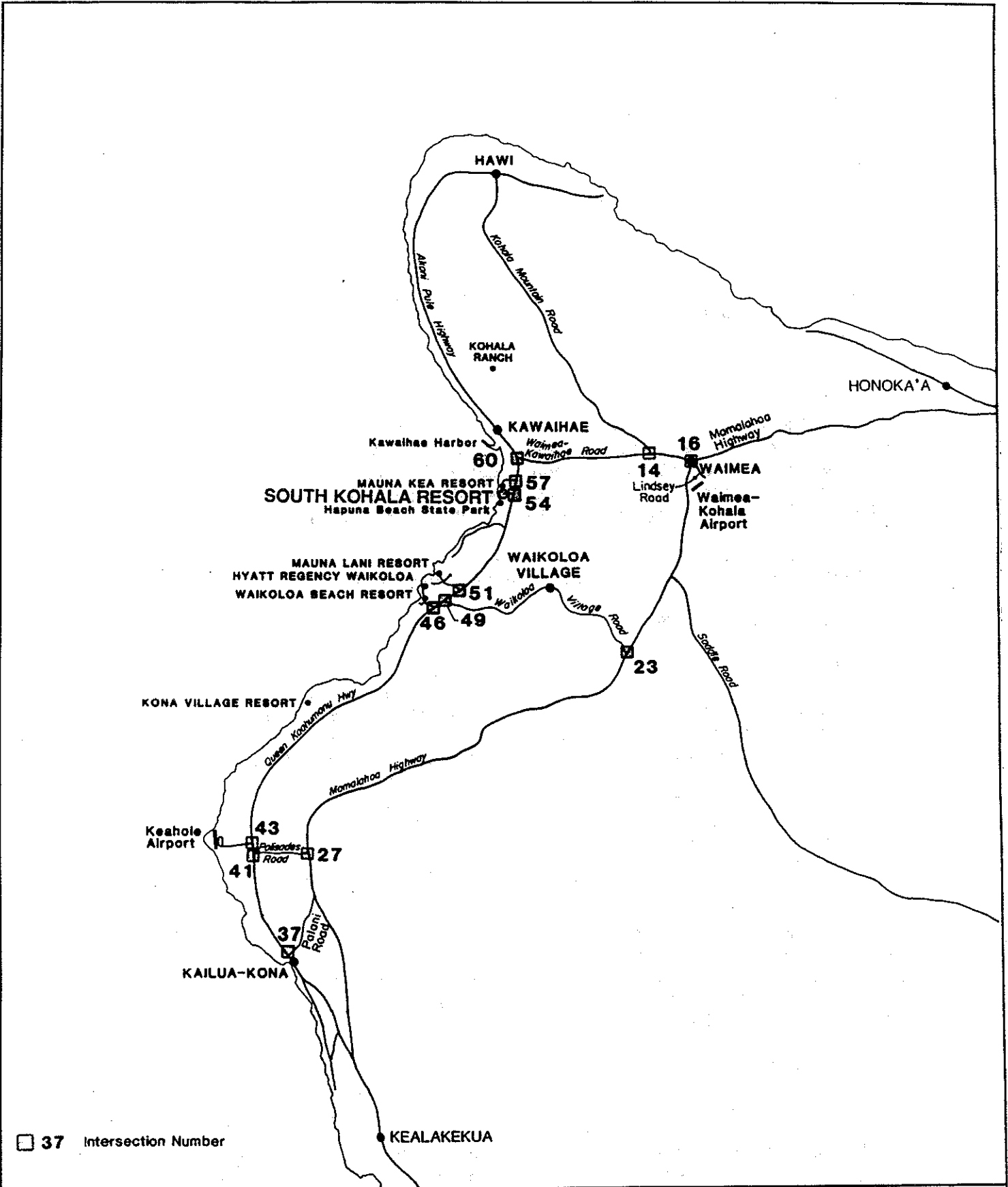
At the request of the Hawaii County Planning Department, a regional traffic analysis has been performed for this EIS, including potential impacts from the South Kohala Resort and from other developments in the region within a ten-year period. This traffic analysis projects impacts for the years 1993 and 1998. Assumptions concerning the extent and timing of development (also used in the socioeconomic impacts section of this report) are as follows:

- o South Kohala Resort: 350 hotel rooms and 15 single-family units in 1993; 110 single-family units and 450 multifamily units in 1998.
- o Ritz-Carlton Mauna Lani: 450 rooms in 1993 and an additional 200 rooms in 1998.
- o Hyatt Regency Waikoloa: 1,260 rooms in 1993.
- o An assumed Hotel "X" located in the vicinity of Keahole Airport: 500 rooms in 1993.
- o Kohala Estates: 47 single-family units in 1993 and 47 units in 1998.
- o Kohala Ranch: 1,300 single-family units and 360 multifamily units in 1993; and 2,265 single-family units and 690 multifamily units in 1998.

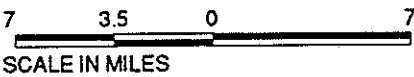
Traffic on selected roadway segments and intersections (see Figure V-5) was analyzed for the existing traffic conditions in 1987 and for six scenarios -- three in 1993 and three in 1998. By structuring the analysis in this way, it was possible to project impacts that could be attributed to the South Kohala Resort development by itself, and also those that could be attributed to regional growth with or without the South Kohala Resort. The six scenarios are as follows:

- Scenario 1 Impact of traffic generated by the South Kohala Resort added to existing traffic (1993).





☐ 37 Intersection Number



NORTH

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987

**Figure V-5  
ROADWAY NETWORK**

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

- Scenario 2     Impact of traffic generated by all other projects listed above (without South Kohala Resort) added to existing traffic (1993).
- Scenario 3     Cumulative impact of traffic generated by all other projects and the South Kohala Resort (1993).
- Scenario 4     Impact of traffic generated by the South Kohala Resort added to existing traffic (1998).
- Scenario 5     Impact of traffic generated by all other projects listed above (without South Kohala Resort) added to existing traffic (1998).
- Scenario 6     Cumulative impact of traffic generated by all other projects and the South Kohala Resort (1998).

Included in the regional traffic analysis are vehicular trips made by both visitors and residents. Much of the additional traffic generated can be attributed to operations and construction employees commuting to and from work, other residents of the West Hawaii region, and material suppliers and others coming and going from various parts of the island.

In the analysis, it was assumed that the traffic generated by the projects listed above constitutes traffic growth in both 1993 and 1998.

#### 2.1.1.2     Computer Model

A computer model -- the Impax traffic model developed by PRC Engineering of Orange, California -- was used to perform the analysis. It is an integrated package of computer programs capable of analyzing incremental traffic loads on street networks related to specific land uses. Input to the computer program described the street system, existing traffic, trip generation from projects, intersection information, and distribution of the project traffic on specified travel paths. Traffic generated by the projects was assigned to the road system in the study area, and analyses were performed for street volumes, intersection turn volumes, and level of service for signalized intersections.

Level of service for unsignalized intersections and roadways were calculated using the methods outlined in the "Highway Capacity Manual" (Transportation Research Board, 1985). "Highway Capacity Software" (U.S. Department of Transportation, Federal Highway Administration, January 1997) are computer programs developed to perform calculations for procedures outlined in the Highway Capacity Manual.

To describe the operational conditions of roadways and intersections, the level of service (LOS) was calculated for the afternoon or P.M. peak hour, which is more pronounced than the A.M. peak hour -- making for a more conservative analysis. LOS is a qualitative measure describing the operational condition within a traffic flow. On a descending scale of "A" to "E," level of service "A" indicates free-flow conditions, with low volumes and high speeds. Level of service "E" represents the extreme opposite conditions where a particular roadway is near or at capacity. Below this is level of service "F", which is a forced condition involving a breakdown in traffic flow.

## 2.1.2 Existing Conditions

### 2.1.2.1 Existing Roadway Conditions

Queen Ka'ahumanu Highway is a State highway which extends along the North Kona and South Kohala coast from Kailua-Kona to Kawaihae. It has two lanes with a posted speed limit of 55 mph. The major intersections on Queen Ka'ahumanu Highway are at Palani Road, Palisades Subdivision Road, Keahole Airport Road, Waikoloa Beach Resort, Waikoloa Village Road, Mauna Lani Resort, Pauko, Hapuna Beach, Mauna Kea Resort, and Waimea-Kawaihae Road. The intersection with Palani Road is four-way, fully channelized, and signalized. The other intersections are unsignalized, channelized "t"s, except for the intersection with the Waimea-Kawaihae Road, which is not channelized.

Mamalaho Highway, a two-way State highway which serves the upland areas of North Kona and South Kohala, has major intersections at Lindsey Road, the Saddle Road, Waikoloa Village Road, Palisades Subdivision Road, and Palani Road. The intersection with Lindsey Road is fully channelized, four-way, and signalized, while the remaining intersections are "t" intersections. The intersection with Waikoloa Village Road is fully channelized while the others are not.

Akoni Pule Highway is a two-lane State highway which extends from Kawaihae to Hawi, with fully channelized intersections at Kohala Estates Road and Kohala Ranch Road.

County roads in the region are Palani Road, Palisades Subdivision Road, Waimea-Kawaihae Road, Lindsey Road, and Kohala Mountain Road. All of these are two-lane roads.

Private two-lane roads are found in Waikoloa Village, Waikoloa Beach Resort, Mauna Lani Resort, Mauna Kea Resort, Kohala Ranch, and Kohala Estates.

### 2.1.2.2 Historic Traffic

Traffic counts were taken by the Highways Division, Department of Transportation, State of Hawaii, at locations listed below from 1974 to 1984. These counts, which do not include turning movements, were taken at an average of once every two years.

| <u>Station No.</u> | <u>Description</u>                                      |
|--------------------|---------------------------------------------------------|
| 8-H                | Queen Ka'ahumanu Highway at Waikoloa Village Road       |
| C-8-M              | Queen Ka'ahumanu Highway at 2.5 north of Kealakehe Pkwy |
| 8-P                | Queen Ka'ahumanu Highway at Keahole Airport Road        |
| 9-A                | Mamalaho Highway at Waikoloa Road                       |
| C-9-C              | Queen Ka'ahumanu Highway at Palani Road                 |
| 10                 | Mamalaho Highway at Kawaihae-Waimea Road                |
| 11                 | Kohala Mountain Road at Kawaihae-Waimea Road            |
| 11-E               | Queen Ka'ahumanu Highway at Kawaihae-Waimea Road        |

The historic traffic data indicates that traffic has grown from 1976 to 1986 by three times in the Kailua area, by two times in the airport area, by 1.8 times in the Waimea area, and by 1.6 times in the Kawaihae area.

### 2.1.2.3 Current Background Traffic

Traffic was counted on Wednesday, January 21, 1987, at 12 intersections shown on Figure V-5, by Belt Collins & Associates with the aid of the Waimea Hawaiian Civic Club and the Kona Hawaiian Civic Club. Turning movements were counted at all intersections from 6:00 AM to 6:00 PM. The counts were taken at the following locations:

| <u>Station No.</u> | <u>Location</u>                                    |
|--------------------|----------------------------------------------------|
| 14                 | Waimea-Kawaihae Road and Kohala Mountain Road      |
| 16                 | Mamalahoa Highway and Lindsey Road                 |
| 23                 | Mamalahoa Highway and Waikoloa Village Road        |
| 27                 | Mamalahoa Highway and Palisades Road               |
| 37                 | Queen Ka'ahumanu Highway and Palani Road           |
| 41                 | Queen Ka'ahumanu Highway and Palisades Road        |
| 43                 | Queen Ka'ahumanu Highway and Keahole Airport Road  |
| 46                 | Queen Ka'ahumanu Highway and Waikoloa Beach Resort |
| 49                 | Queen Ka'ahumanu Highway and Waikoloa Village Road |
| 51                 | Queen Ka'ahumanu Highway and Mauna Lani Resort     |
| 57                 | Queen Ka'ahumanu Highway and Mauna Kea Resort      |
| 60                 | Queen Ka'ahumanu Highway and Waimea-Kawaihae Road  |

Based on traffic counts in Puna, the only continuous recording station on the Big Island, it has been determined that Wednesday is an average day and Friday has the highest traffic levels -- approximately five percent higher than Wednesday. Therefore, these Wednesday counts were increased by five percent to reflect the peak weekday traffic.

Peak traffic generally occurred from 7:00 to 8:30 AM and 3:00 to 5:00 PM. The PM peak hour was the most pronounced, with the greater number of vehicles. The traffic in the region does not have distinct peak hours but is fairly uniform from mid-morning to late afternoon. This traffic profile is characteristic of areas with visitor facilities.

### 2.1.2.4 Future Background Traffic

Traffic growth is caused by a number of factors other than development, such as aging and increased mobility of the population. For the purposes of this analysis, a three percent per year growth factor was assumed and added to the adjusted 1987 counts to account for traffic growth that would have occurred without development.

## 2.1.3 Probable Impacts on Roadways and Traffic

### 2.1.3.1 Trip Generation

Trip generation rates for hotels were derived from traffic counts taken at the entrance to Mauna Lani and Mauna Kea Resorts on January 21, 1987. The peak hour traffic was correlated to the number of hotel rooms to derive peak hour generation rates. The average trip generation rates per hotel room are as follows:

|              | <u>Enter</u> | <u>Exit</u> |
|--------------|--------------|-------------|
| AM Peak Hour | 0.36         | 0.06        |
| PM Peak Hour | 0.31         | 0.45        |

Trip generation rates for single-family and multifamily units are based on rates published in the manual, "Trip Generation" (Institute of Transportation Engineers, 1982). Trip generation rates are as follows:

|               | <u>Enter</u> | <u>Exit</u> |
|---------------|--------------|-------------|
| Single Family |              |             |
| AM Peak Hour  | 0.21         | 0.55        |
| PM Peak Hour  | 0.63         | 0.37        |
| Multifamily   |              |             |
| AM Peak Hour  | 0.07         | 0.37        |
| PM Peak Hour  | 0.37         | 0.18        |

Trips generated by the projects included in the analysis are shown below:

| <u>Project</u>      | <u>AM Peak Hour</u> |             | <u>PM Peak Hour</u> |             |
|---------------------|---------------------|-------------|---------------------|-------------|
|                     | <u>Enter</u>        | <u>Exit</u> | <u>Enter</u>        | <u>Exit</u> |
| 1993                |                     |             |                     |             |
| South Kohala Resort | 128                 | 25          | 113                 | 160         |
| Ritz-Carlton        | 162                 | 27          | 140                 | 202         |
| Hyatt Waikoloa      | 454                 | 76          | 391                 | 567         |
| Hotel "X"           | 140                 | 25          | 120                 | 175         |
| Kohala Ranch        | 85                  | 245         | 274                 | 156         |
| 1998                |                     |             |                     |             |
| South Kohala Resort | 145                 | 106         | 195                 | 200         |
| Ritz-Carlton        | 234                 | 39          | 202                 | 292         |
| Hyatt Waikoloa      | 454                 | 76          | 391                 | 567         |
| Hotel "X"           | 140                 | 25          | 120                 | 175         |
| Kohala Ranch        | 158                 | 460         | 514                 | 293         |

### 2.1.3.2 Trip Distribution

The trips generated by the projects were assumed to be distributed to the various locations in the region via the existing street network by the following percentages for the PM peak hour:

| <u>Destination</u>            | <u>South Kohala</u> | <u>Ritz-Carlton</u> | <u>Hyatt Waikoloa</u> | <u>Hotel "X"</u> |
|-------------------------------|---------------------|---------------------|-----------------------|------------------|
| North Kohala                  | 15                  | 15                  | 10                    | 9                |
| Waimea West of Lindsey        | 15                  | 15                  | 10                    | 9                |
| Mamalaho Hwy North of Lindsey | 20                  | 20                  | 10                    | 10               |
| Lindsey Rd East of Mamalaho   | 5                   | 5                   | 1                     | 1                |
| Mamalaho Hwy South of Lindsey | 5                   | 5                   | 2                     | 2                |
| Puako                         | 1                   | 1                   | 2                     | 2                |

| <u>Destination</u>                            | <u>South Kohala</u> | <u>Ritz-Carlton</u> | <u>Hyatt Waikoloa</u> | <u>Hotel "X"</u> |
|-----------------------------------------------|---------------------|---------------------|-----------------------|------------------|
| Waikoloa Village                              | 5                   | 5                   | 10                    | 7                |
| Keahole Airport                               | 2                   | 2                   | 2                     | 2                |
| Palisades Subdivision                         | 5                   | 5                   | 10                    | 11               |
| Palani Road Mauka of Queen Ka'ahumanu Highway | 5                   | 5                   | 13                    | 14               |
| Queen Ka'ahumanu Highway South of Palani Road | 10                  | 10                  | 15                    | 17               |
| Kailua Makai of Queen Ka'ahumanu Highway      | 12                  | 12                  | 15                    | 16               |

Kohala Ranch, being mainly a residential community, would have distribution of traffic that is different from that of the resort projects. PM peak hour traffic to and from Kohala Ranch is assumed to be distributed by the following percentages:

| <u>Description</u>            | <u>Percentage</u> |
|-------------------------------|-------------------|
| Exiting from Kohala Ranch to: |                   |
| Waimea                        | 60                |
| South Kohala and Kona         | 20                |
| North Kohala                  | 20                |
| Entering Kohala Ranch from:   |                   |
| Waimea                        | 15                |
| South Kohala                  | 83                |
| North Kohala                  | 2                 |

### 2.1.3.3 Results of Analysis

See Table V-30 for a summary of the roadway level of service by scenario.

Traffic from the South Kohala Resort (Scenarios 1 and 4) would cause the level of service of the Waimea-Kawaihae Road in Waimea to be reduced from "B" to "D" in 1993 and 1998. The LOS on Queen Ka'ahumanu Highway from Kailua to Kawaihae would remain at the current level of service or be reduced by one or two.

Traffic from all the projects in the area without the South Kohala Resort (Scenarios 2 and 5) would cause the level of service of the Waimea-Kawaihae Road in Waimea to go to "D" in 1993 and "E" in 1998. On Queen Ka'ahumanu Highway from Kailua to the airport, it would be reduced to "E-F" in 1993 and remain at that level in 1998, and from the airport to Kawaihae, the LOS would drop to "D" in 1993 and "D-E" in 1998.

Cumulative traffic from all the projects in the area (Scenarios 3 and 6) would cause the level of service to be reduced on the Waimea-Kawaihae Road in Waimea to "E" in 1993 and 1998. The LOS on Mamalahoa Highway would go to "C" in 1993 and 1998. On the Queen Ka'ahumanu Highway from the airport to Kawaihae, the level of service would be reduced to "E" in 1998, and north of Palani Road would be reduced to "F" in 1993 and 1998.

Table V-30

Roadway Level of Service (LOS)\*

| Roadway Section                               | Study      | Existing | 1993 | 1998 |
|-----------------------------------------------|------------|----------|------|------|
| Waimea-Kawaihae Road                          | Existing   | B-C      |      |      |
|                                               | Scenario 1 |          | D    |      |
|                                               | Scenario 2 |          | D    |      |
|                                               | Scenario 3 |          | E    |      |
|                                               | Scenario 4 |          |      | D    |
|                                               | Scenario 5 |          |      | E    |
|                                               | Scenario 6 |          |      | E    |
| Mamalahoa Hwy South of Lindsey                | Existing   | B        |      |      |
|                                               | Scenario 1 |          | B    |      |
|                                               | Scenario 2 |          | B    |      |
|                                               | Scenario 3 |          | C    |      |
|                                               | Scenario 4 |          |      | C    |
|                                               | Scenario 5 |          |      | C    |
|                                               | Scenario 6 |          |      | C    |
| Mamalahoa Hwy North of Lindsey                | Existing   | D        |      |      |
|                                               | Scenario 1 |          | D    |      |
|                                               | Scenario 2 |          | D    |      |
|                                               | Scenario 3 |          | D    |      |
|                                               | Scenario 4 |          |      | D    |
|                                               | Scenario 5 |          |      | E    |
|                                               | Scenario 6 |          |      | E    |
| Queen Ka'ahumanu Hwy North of Palani Road     | Existing   | E        |      |      |
|                                               | Scenario 1 |          | E    |      |
|                                               | Scenario 2 |          | F    |      |
|                                               | Scenario 3 |          | F    |      |
|                                               | Scenario 4 |          |      | E    |
|                                               | Scenario 5 |          |      | F    |
|                                               | Scenario 6 |          |      | F    |
| Queen Ka'ahumanu Hwy South of Keahole Airport | Existing   | C        |      |      |
|                                               | Scenario 1 |          | C    |      |
|                                               | Scenario 2 |          | E    |      |
|                                               | Scenario 3 |          | E    |      |
|                                               | Scenario 4 |          |      | D    |
|                                               | Scenario 5 |          |      | E    |
|                                               | Scenario 6 |          |      | F    |
| Queen Ka'ahumanu Hwy South of Waikoloa Beach  | Existing   | B        |      |      |
|                                               | Scenario 1 |          | C    |      |
|                                               | Scenario 2 |          | D    |      |
|                                               | Scenario 3 |          | E    |      |
|                                               | Scenario 4 |          |      | C    |
|                                               | Scenario 5 |          |      | D    |
|                                               | Scenario 6 |          |      | E    |

Table V-30

Roadway Level of Service (LOS)\*  
(continued)

| <u>Roadway Section</u>                                | <u>Study</u> | <u>Existing</u> | <u>1993</u> | <u>1998</u> |
|-------------------------------------------------------|--------------|-----------------|-------------|-------------|
| Queen Ka'ahumanu Hwy South of<br>South Kohala Resort  | Existing     | B               |             |             |
|                                                       | Scenario 1   |                 | B           |             |
|                                                       | Scenario 2   |                 | D           |             |
|                                                       | Scenario 3   |                 | D           |             |
|                                                       | Scenario 4   |                 |             | C           |
|                                                       | Scenario 5   |                 |             | E           |
|                                                       | Scenario 6   |                 |             | E           |
| Queen Ka'ahumanu Hwy South of<br>Waimea-Kawaihae Road | Existing     | B               |             |             |
|                                                       | Scenario 1   |                 | C           |             |
|                                                       | Scenario 2   |                 | D           |             |
|                                                       | Scenario 3   |                 | E           |             |
|                                                       | Scenario 4   |                 |             | D           |
|                                                       | Scenario 5   |                 |             | E           |
|                                                       | Scenario 6   |                 |             | E           |

\*LOS "A" - Free flow conditions.

LOS "B" - Stable flow; presence of other users in the traffic stream begins to be noticeable.

LOS "C" - Stable flow; operation of individual users becomes significantly affected by interaction with others in the traffic stream.

LOS "D" - High density but stable flow.

LOS "E" - Operating conditions at or near capacity level.

LOS "F" - Forced or breakdown flow; amount of traffic approaching a point exceeds the amount which can traverse the point.



The intersections will also be affected by the increased traffic. The signalized intersections at Mamalahoa Highway and Lindsey Road in Waimea and Queen Ka'ahumanu Highway and Palani Road in Kailua are currently operating at level of service "A" and "E", respectively. Level of service for Scenarios 1 and 4 (South Kohala Resort only) will be "A" in 1993 and 1998 at the Mamalahoa/Lindsey intersection and remain at "E" at the Queen Ka'ahumanu/Palani intersection. For Scenarios 3 and 6 (cumulative impact), level of service at the Mamalahoa/Lindsey intersection will be "A" in 1993 and 1998, and the Queen Ka'ahumanu/Palani intersection will be at LOS "F".

The level of service of the unsignalized intersections can be represented by a selected group as shown in Appendix K. The left turn movement out of a minor road onto a major road is most affected by the growth of traffic within an intersection. The levels of service of the left-turn movements out of a minor street onto a major street are currently at levels of service "B-D". With Scenarios 1 and 4, levels of service will go to "C-F", and with Scenarios 2, 3, 5 and 6, level of service will go to "F".

#### **2.1.3.4 Conclusions and Mitigation Measures**

The South Kohala Resort development will have an impact on the roadway system in the North Kona/South Kohala area. However, the subject project by itself will not cause the level of service of the roadway system to be lowered to such an extent as to require improvements to keep traffic flowing smoothly. On the other hand, the cumulative impact of all the projects planned for the region, if they develop on schedule, will cause the operating levels of the roadways and intersections to deteriorate to a point where improvements would be required for smooth traffic operation. Traffic impact is the result of an accumulation of traffic from all generators.

Mitigation measures include the addition of roadway lanes and the construction of intersection improvements, as well as measures not directly related to roadways. These include carpooling, implementation of staggered work hours, and bussing of employees, all of which would most effectively be approached on a coordinated regional basis by public and private entities.

In the area of roadway and intersection improvements, the following specific mitigation measures are suggested:

- a. Queen Ka'ahumanu Highway, from Kailua-Kona to Keahole Airport, is expected to operate at level of service "F". To improve traffic flow, two lanes could be added to the highway. Such an addition would improve the traffic flow and reduce it to level of service "C".
- b. In the future, the intersection of Queen Ka'ahumanu Highway and Palani Road is expected to operate at level of service "F". Additional left-hand turns could be added to improve traffic flow through the intersection. Also, the intersection of Queen Ka'ahumanu Highway and Waimea-Kawaihae Road could be improved by channelizing the intersection.

## 2.2 AIRPORTS

### 2.2.1 Existing Facilities

The Kohala Coast region is served by two airports -- Keahole and Waimea Airports, operated by the State Department of Transportation.

Keahole Airport is located about 24 miles south of the South Kohala Resort site. It is served by all three major interisland carriers, as well as several commuter airlines and cargo companies. The airport also handles direct flights from the mainland United States. Waimea Airport has regularly scheduled commuter airline service.

Construction projects currently underway at Keahole include south ramp improvements (\$6,700,000), terminal building addition (\$873,000), and miscellaneous safety improvements (\$3,045,000). The following projects are planned for fiscal year 1987-1989: design and construction of improvements to buildings, roads, parking, aprons, runways, taxiways, and utilities (\$12,200,000); design and construction of airfield improvements (\$900,000); and design and construction of Civil Air Patrol hangar training facilities (\$250,000).

### 2.2.2 Probable Impacts

The proposed South Kohala Resort is not expected to have a significant effect on Keahole Airport's service. The airport served about 130,000 mainland passengers in 1985 and over 1.3 million interisland passengers during the same year (State of Hawaii Data Book, 1986, p. 491). However, the cumulative effect of resort development in West Hawaii will eventually require improvements to Keahole Airport. The master plan recommending future airport expansion and runway extension is expected to be updated by the Department of Transportation.

## 2.3 HARBORS

### 2.3.1 Existing Facilities

Kawaihae Harbor, north of the South Kohala Resort site, is the only deep draft harbor in West Hawaii. It is used primarily by interisland barges and is also used extensively by the U.S. military. Cargo handled includes building materials, consumer goods, large equipment and machinery, agricultural goods, as well as provisions and supplies needed to operate hotels and resorts in South Kohala and Kona. Kawaihae also has anchorage for small recreational boats.

Planned capital improvement projects for fiscal year 1987-1989 include design and construction of a pier extension, demolition of abandoned structures, development of yard areas, dredging, and other improvements. The estimated cost is \$5,175,000. Two smaller projects were recently completed (comfort station and fender piers).

The Honokohau Small Boat Harbor is about 28 miles south of the project site, in the North Kona District. It has become the primary anchorage for recreational and charter fishing boats in West Hawaii. Other small boat harbors are located further south in Kailua-Kona and Keauhou. Construction of

additional berthing facilities at Honokohau (estimated cost: \$1,545,000) will begin shortly, and improvements to the harbor's water system, parking, and roadways are scheduled for fiscal year 1987-1989.

### **2.3.2 Probable Impacts**

Additional resort development and other economic endeavors in West Hawaii have dramatically increased the flow of goods through Kawaihae Harbor. Matson anticipated movement of 2,500 containers through Kawaihae during 1987, its first year of service to the port. It now appears that Matson will move closer to 8,000 containers before year-end, and no let-up is foreseen given the level of goods required by the new Hyatt hotel at Waikoloa and other planned projects in the region.

Recognizing the heavy increase in flow of goods and problems with existing facilities at Kawaihae, the State Department of Transportation (DOT) secured an appropriation during the last legislative session to expand commercial piers and make other improvements. Funding is now in place to begin expansion work. Concurrently, DOT is working on a long-range plan ("2010 plan") for the harbor to meet the needs of the community, including landowners, businesses, recreational boat owners, the military, etc.

## **3.0 AIR QUALITY IMPACTS**

### **3.1 INTRODUCTION**

Barry D. Root, air pollution consultant, conducted a study with the purpose of describing the existing ambient air quality in the project area and estimating the magnitude of any increase in air pollutant concentrations resulting from actions related to the proposed project. A copy of the complete study is included in Appendix H.

### **3.2 EXISTING CONDITIONS**

Present air quality in the project area is estimated to be almost pristine. This conclusion is based on air pollutant measurements from State of Hawaii Department of Health monitoring stations located nearest to the project. A summary of these measurements, compared against State ambient air quality standards (AQS), is shown in Table V-31.

An AQS is a pollutant concentration not to be exceeded over a specified sampling period which varies for each pollutant, depending upon the type of exposure necessary to cause adverse effects. The State of Hawaii AQS limits are, in most cases, significantly more stringent than the lowest comparable national limits. In particular, the State one hour standard for carbon monoxide is four times more stringent than the national standard.

Data from several different sampling stations are included in Table V-31 since there are no long term sampling stations located in the immediate vicinity of the project. Particulate data shown for 1980 to 1982 is from Honoka'a, measurements for 1983 and 1984 are from Hilo, and the 1985 data is from Kona. (The Kona particulate sampling station was established in August 1985 and closed in August 1986.) Sulfur dioxide measurements from 1980

Table V-31

## SUMMARY OF AIR POLLUTANT MEASUREMENTS AT NEAREST MONITORING STATIONS

| POLLUTANT                 | 1980                    | 1981     | 1982  | 1983  | 1984        | 1985   | 1986    |
|---------------------------|-------------------------|----------|-------|-------|-------------|--------|---------|
| <b>PARTICULATE MATTER</b> |                         |          |       |       |             |        |         |
| No. of Samples            | 50                      | 52       | 21    | 47    | 55          | 34     | 40      |
| Range of Values           | 11-49                   | 12-66    | 10-25 | 7-50  | 7-27        | 6-22   | 4-28    |
| Average Value             | 23                      | 24       | 16    | 17    | 15          | 12     | 16      |
| No. of Times              |                         |          |       |       |             |        |         |
| State AQS Exceeded        | 0                       | 0        | 0     | 0     | 0           | 0      | 0       |
| <b>SULFUR DIOXIDE</b>     |                         |          |       |       |             |        |         |
| No. of Samples            | 46                      | 45       | 45    | 43    | 50          | 31     | 40      |
| Range of Values           | <5-17                   | <5-11    | <5-6  | <5-23 | <5-7        | <5-8   | <5-12   |
| Average Value             | <5                      | <5       | <5    | <5    | <5          | <5     | <5      |
| No. of Times              |                         |          |       |       |             |        |         |
| State AQS Exceeded        | 0                       | 0        | 0     | 0     | 0           | 0      | 0       |
| <b>CARBON MONOXIDE</b>    |                         |          |       |       |             |        |         |
| No. of Samples            |                         | 286      | 311   | 173   | 318         | 342    | 258     |
| Range of Values           |                         | 1.2-13.8 | 0-4.6 | 0-8.6 | .6-10.9     | 0-10.4 | .2-13.5 |
| Average Value             |                         | 5.1      | 1.2   | 2.3   | 2.4         | 1.5    | 2.2     |
| No. of Times              |                         |          |       |       |             |        |         |
| State AQS Exceeded        |                         | 13       | 0     | 0     | 1           | 1      | 2       |
| <b>OXIDANT (OZONE)</b>    |                         |          |       |       |             |        |         |
| No. of Samples            | 295                     | 314      | 335   | 349   | 296         | 341    | 294     |
| Range of Values           | 10-84                   | 10-104   | 0-151 | 0-123 | 0-104       | 8-198  | 10-88   |
| Average Value             | 48                      | 37       | 32    | 46    | 44          | 43     | 34      |
| No. of Times              |                         |          |       |       |             |        |         |
| State AQS Exceeded        | 0                       | 1        | 2     | 2     | 1           | 3      | 0       |
| <b>OTHERS:</b>            |                         |          |       |       |             |        |         |
|                           | <b>NITROGEN DIOXIDE</b> |          |       |       | <b>LEAD</b> |        |         |
| No. of Samples            |                         | 46       |       |       | 52          | 58     | 46      |
| Range of Values           |                         | 6-77     |       |       | .5-.8       | 0-.5   | 0-.3    |
| Average Value             |                         | 25       |       |       | 0.6         | 0.2    | 0.1     |
| No. of Times              |                         |          |       |       |             |        |         |
| State AQS Exceeded        |                         | 0        |       |       | 0           | 0      | 0       |

NOTES: See text for locations of monitoring stations. Carbon monoxide is reported in milligrams per cubic meter; other pollutants in micrograms per cubic meter. Carbon monoxide and ozone are daily peak one hour values; lead is quarterly; other pollutant values are for a 24 hour sampling period. Data for 1986 are for the first three quarters of the year.

SOURCE: State of Hawaii Department of Health

through 1984 are from Hilo, while those for 1985 and 1986 are from Kona. Measurements for ozone, nitrogen dioxide, and lead are from sampling stations in urban Honolulu, since monitoring for other regulated pollutants has been confined to the island of Oahu.

It appears that State of Hawaii ambient air quality standards for particulates, sulfur dioxide, nitrogen dioxide, and lead are currently being met at monitoring stations nearest to the project area. On the other hand, allowable State standards for vehicle-related air pollutants--carbon monoxide and ozone--are being violated at a rate of about once or twice a year.

Ozone is an indicator of the formation of photochemical pollutants in the air, a condition which tends to develop if the air mass over the islands has been fairly stable with little wind flow for an extended period. Concentrations of carbon monoxide, on the other hand, are more directly related to vehicular emissions and tend to be highest during rush hour traffic. It may thus be the pollutant most likely to cause difficulty in meeting allowable State AQS as a result of new development.

### **3.3 PROBABLE IMPACTS AND MITIGATION MEASURES**

#### **3.3.1 Short-Term Effects**

The only direct adverse air quality impact that the proposed project is likely to create is the emission of fugitive dust during site preparation and construction. Actual emissions can be expected to vary greatly depending upon the type of activity being conducted on any given day. In any case, special care will have to be exercised to avoid creating a fugitive dust problem for the adjacent Mauna Kea Resort and Hapuna Beach State Recreation Area.

With no existing soil cover, excavation will require blasting, and landscaping will require a significant amount of dirt hauling. Another generator of fugitive dust will be heavy construction equipment moving over unpaved surfaces. This problem can be substantially mitigated by completing and paving roadways and parking areas as early in the development process as possible.

State of Hawaii regulations stipulate the control measures that should be employed to reduce fugitive dust emission. The effective wetting down of loose soil areas can reduce particulate emission levels from construction sites by as much as 50 percent. Other control measures include good housekeeping on the job site and paving or landscaping of bare soil areas as quickly as possible.

Heavy construction equipment will also emit some air pollutants in the form of engine exhausts. Carbon monoxide emissions from large diesel engines are generally about equal to those from a single automobile, while nitrogen dioxide emissions can be quite high. Fortunately, nitrogen dioxide from other sources in the area should be relatively low, so the overall impact of exhaust pollution from construction equipment should be minor.

### 3.3.2 Long-Term Effects

#### 3.3.2.1 Impact of Increased Energy Utilization

Once completed, the proposed South Kohala Resort is expected to have little direct impact on the air quality of the surrounding region. The energy requirements of the development will have some impact on the air quality in the vicinity of the power plant serving the area, since electricity on the Big Island is generated primarily by the combustion of oil or bagasse at steam turbine plants. Coal has recently been tested as a substitute for oil, and a small amount of electricity is also being generated from geothermal and wind sources.

To a certain extent, the potential air quality impact can be mitigated by implementing solar energy design features to the maximum extent possible (e.g., solar panels for water heating), as well as incorporating architectural design features which minimize air conditioning needs. It is also possible that larger scale, "clean" systems such as wind farms and ocean thermal energy conversion (OTEC) may be providing some of the required energy needs of the project within the next few decades.

#### 3.3.2.2 Impact of Increased Traffic

Long-term air quality impacts are expected in those areas where traffic congestion can potentially be worsened by the addition of vehicles traveling to and from the proposed project. A detailed carbon monoxide modeling study was carried out to evaluate these impacts, focusing on the proposed new intersection of the resort entry road and the Queen Ka'ahumanu Highway. The traffic study conducted for the project indicated that the major impact of new traffic associated with the South Kohala Resort will be at this intersection.

Computations were made for current peak hour conditions and for study year 1999 (after project completion). Calculations for 1999 included peak hour traffic volume scenarios with and without the proposed project. The 1999 scenario included traffic not only from South Kohala Resort but from other projects slated for completion in the area by that date (see Section 2.1, Traffic Impact Analysis). Two EPA computer models were used: MOBILE3 was run to produce vehicular carbon monoxide emission estimates for each of the years studied, and HIWAY 2 was used to calculate carbon monoxide concentrations at each selected receptor site for each scenario studied.

The modeling study showed that even under worst case traffic and meteorological conditions, the present levels of carbon monoxide are almost negligible. While the proposed project would increase these levels significantly, projected worst case levels after project completion are well within allowable State of Hawaii and national air quality standards. Results of the peak hour carbon monoxide study are presented below.

Results of Peak Hour Carbon Monoxide Analysis  
at Critical Receptor Site Near Queen Ka'ahumanu Highway  
and New South Kohala Resort Entry Intersection  
(Milligrams per Cubic Meter)

| <u>Scenario</u>             | <u>1987</u> | <u>1999</u> |
|-----------------------------|-------------|-------------|
| Without South Kohala Resort | 0.3         | 0.6         |
| With South Kohala Resort    |             | 6.6         |

Notes:

1. For comparison, the State of Hawaii AQS for carbon monoxide is 10 mg/m<sup>3</sup>; the national AQS is 40 mg/m<sup>3</sup>.
2. See Appendix H, Figure 2, for location of critical receptor site.
3. See Appendix H, Section 7, for models and assumptions used for producing these estimates. The 1999 scenario with South Kohala resort includes traffic from other projects slated for completion in the area by that date.

No specific mitigation measures seem necessary in this regard. It is worth noting, however, that the planting of a strand of dense vegetation (trees and shrubs) near the major intersection will help to decrease the levels of roadway-generated particulates that reach residents, guests, and others within the project boundaries.

#### 4.0 NOISE IMPACTS

##### 4.1 INTRODUCTION

An acoustic study was performed for the proposed South Kohala Resort by Yoichi Ebisu of Darby-Ebisu & Associates in May 1984. A re-evaluation of the potential traffic noise impacts associated with the project was recently performed by Y. Ebisu & Associates, using the most recent concept plans for the resort and newly generated traffic data (see Appendix I for a copy of the full report). Traffic volumes and noise level predictions were updated to include existing (base year) and future study years of 1987 and 1998, respectively. The updated and expanded study also addressed concerns expressed regarding noise intrusion from hotel activities on users of Hapuna Beach, as well as the potential for increased helicopter noise.

The noise descriptor used in the Ebisu study is the generally accepted Day-Night Sound Level (Ldn), which represents the 24-hour average sound level for a given day. It can be used to relate the acceptability of the noise environment for various land uses. It is generally accepted among federal agencies that residential housing development is acceptable in areas where exterior noise does not exceed 65 Ldn. This value is used as a federal regulatory threshold for determining the necessity for special noise abatement measures in federally assisted projects. Federal agencies (HUD, DOT, and EPA) recognize 55 Ldn as a desirable goal for exterior noise in residential

areas, but this lower level has not been adopted for regulatory purposes due to economic and technical feasibility considerations.

Y. Ebisu & Associates relied on the more conservative level of 55 Ldn for its study, in recognition of the open living conditions in Hawaii. It was felt that this is more appropriate when relatively quiet areas are under evaluation. Also, at this level, the noise attenuation characteristics of typical naturally ventilated dwellings produce acceptable interior noise levels (approximately 46 Ldn).

Exterior noise contours (lines of equal noise levels) from 50 Ldn to 70 Ldn, in 5 Ldn increments, were used to form the basis for the noise impact evaluations. Naturally ventilated residential units outside the 55 Ldn contour were considered "Unconditionally Acceptable," areas inside the 65 Ldn contour were considered "Normally Unacceptable," and areas between the 55 and 65 Ldn were considered "Acceptable."

The Federal Highway Administration (FHWA) Noise Prediction Model was used with model parameters adjusted to reflect terrain, ground cover, and local shielding conditions. Base year noise contours were generated following on-site noise measurements and noise model calibration. The measured noise levels were compared with model predictions to determine differences between measured and calculated noise levels for the base year, and to refine predictions of future traffic noise levels.

It should be noted that, based on comparisons of measured and predicted noise levels, traffic noise model predictions along the Queen Ka'ahumanu Highway may be as much as 5 Ldn units higher than actual values. Probable causes may be the quieter mix of new automobiles and light trucks and the low number of heavy diesel trucks.

#### **4.2 EXISTING CONDITIONS**

A comparison of 1984 traffic counts with more recent 1987 traffic counts on Queen Ka'ahumanu Highway shows that traffic volumes on the highway have increased approximately 50 percent during the three year period. Assuming that no changes have occurred in vehicle speeds or traffic mix, a corresponding increase in traffic noise levels of approximately 2 Ldn units has probably occurred from 1984 to 1987--for example, from 67 Ldn to 69 Ldn on Queen Ka'ahumanu Highway, fronting the proposed project just south of the Mauna Kea Resort entrance. The base year noise contours are shown in Figure 3 in Appendix I. Table V-32 presents the maximum setback distances of the 65, 60, and 55 Ldn noise contours from the centerline of the Queen Ka'ahumanu Highway.

#### **4.3 PROBABLE IMPACTS AND MITIGATION MEASURES**

##### **4.3.1 Short-Term Effects**

Depending on the type of construction activity, distances at which outdoor construction noise are predicted to be audible range from 500 to 2,000 feet. The more intense noise levels (90 to 70 dBA), however, are expected to be limited to receptor distances of 50 to 500 feet. Adverse impacts are not expected to be in the "public health and welfare" category, but will be limited to the temporary degradation of the quality of the acoustic environment in the surrounding area.



Table V-32

EXISTING AND FUTURE DISTANCES TO  
65, 60, and 55 Ldn CONTOURS IN PROJECT ENVIRONS

| STREET SECTION                                     | 65 Ldn SETBACK (FT) |      | 60 Ldn SETBACK (FT) |      | 55 Ldn SETBACK (FT) |      |
|----------------------------------------------------|---------------------|------|---------------------|------|---------------------|------|
|                                                    | 1987                | 1998 | 1987                | 1998 | 1987                | 1998 |
| Queen Kaahumanu Highway:<br>S. of MKR Entrance Rd. | 88                  | 163  | 189                 | 351  | 407                 | 756  |
| S. of Kawaihae Rd.                                 | 89                  | 164  | 191                 | 354  | 412                 | 763  |
| S. of SKR Entrance Rd.                             | 89                  | 152  | 191                 | 328  | 412                 | 707  |
| SKR Entrance Road                                  | -                   | 71   | -                   | 154  | -                   | 331  |

- Notes:
1. All setback distances are from the roadways' centerlines.
  2. Ldn assumed to be equal to Peak Hour Leq plus 3.1 dB for Queen Kaahumanu Hwy.
  3. Ldn assumed to be equal to Peak Hour Leq plus 4.7 dB for South Kohala Resort Entrance Road.

Certain measures will be taken to lessen these impacts, but mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources and nature of the work. The following methods are generally adequate for minimizing the short term impacts of construction noise: (a) use of properly muffled equipment on the job site; (b) compliance with State of Hawaii Department of health construction noise regulations, curfews, and permit procedures; and (c) early phasing of the construction of landscaped buffer/berms between noise sensitive receptors and the job sites of later phases of construction.

#### 4.3.2 Long-Term Effects

##### 4.3.2.1 Traffic Noise

By 1998, the estimated completion date of the development, traffic and noise levels associated with project and non-project traffic are expected to increase to the levels shown on Table V-33. It is anticipated that non-project traffic will triple between 1987 (base year) and 1998, and traffic noise levels at receptor locations along Queen Kaahumanu Highway are predicted to rise by 2 Ldn units as a result of non-project traffic. Approximately 30 percent of the total increases in traffic noise level from 1987 to 1998 is expected to be attributable to project traffic, with 70 percent associated with non-project traffic.

Table V-32 shows the calculated distances from the highway centerline to the future 65, 60, and 55 Ldn contours under the worst case, unobstructed line-of-sight conditions, for the years 1987 and 1998. The distances (or widths) of the noise contours are predicted to double by 1998, primarily as a result of non-project traffic.

The predicted traffic noise contours along Queen Ka'ahumanu Highway in 1998 are indicated in Figure 2 in Appendix I. These future contours assume that existing terrain and topographical features are not significantly altered.

Because of the predicted 5 Ldn increase in traffic noise from 1984 to 1998 (2 Ldn from 1984 to 1987, plus 3 Ldn from 1987 to 1998), the original 1984 noise contours shown in Figure 3 in Appendix I were used to depict the future traffic noise at The Fairways at Mauna Kea North and South, after first increasing the original contour values by 5 Ldn units. For the area near the proposed South Kohala Resort entrance road, the future traffic noise contours were developed by interpolating between the 1995 contour lines of the original Figure 4, Appendix I.

It can be concluded that two existing homes within The Fairways at Mauna Kea South will experience traffic noise levels above 55 but below 65 Ldn--a change from "Minimal" to "Moderate Exposure." Other existing homes are expected to remain in the "Minimal Exposure" noise category.

The future High Bluffs development, just makai of the highway, is predicted to be in the "Moderate" to "Significant Exposure" category. On the mauka side of the highway, the planned golf course will be an adequate noise buffer for the majority of the developments in the area. With the possible

Table V-33

COMPARISON OF 1995 AND 1998 TRAFFIC VOLUMES AND NOISE LEVELS

| ROADWAY                          | LOCATION                                                              | --- DAILY TRAFFIC VOLUME / Ldn ---<br>1995 | 1998              | INCREASE FROM<br>1995 TO 1998 |
|----------------------------------|-----------------------------------------------------------------------|--------------------------------------------|-------------------|-------------------------------|
| Q. Kaahumanu Highway             | South of Kawaihae Road intersection (Station 11E, 4 & 8).             | 7,693 VPD/70 Ldn                           | 23,420 VPD/72 Ldn | +2 Ldn                        |
| Q. Kaahumanu Highway             | Between Mauna Kea Beach Hotel and South Kohala Resort Entrance Roads. | 7,693 VPD/70 Ldn                           | 23,110 VPD/72 Ldn | +2 Ldn                        |
| Q. Kaahumanu Highway             | South of proposed South Kohala Resort Entrance Road Intersection.     | 7,693 VPD/70 Ldn                           | 20,910 VPD/72 Ldn | +2 Ldn                        |
| South Kohala Resort Entrance Rd. | At Queen Kaahumanu Hwy. Intersection.                                 | 5,522 VPD/65 Ldn                           | 9,410 VPD/67 Ldn  | +2 Ldn                        |

Notes: 1. Noise levels applicable at 50 FT from roadways' centerlines, and for 180 degree field-of-view.

2. Refer to TABLE 5 for traffic noise modeling assumptions.

exception of the proposed multi-family development on Parcel "P", most of the residential lots should not be exposed to 65 Ldn noise contribution from the highway.

Traffic noise mitigation measures will be considered for reducing traffic noise at the proposed High Bluffs and Parcel "P" residential lots to at least 60 Ldn, or preferably to 55 Ldn. These will include the use of walls or berms to shield the lots from highway and entrance road noise. Orientation of living and bedroom windows toward the direction opposite from traffic sources will also be considered. If berm or wall construction is not feasible, other options such as alternate siting, sound attenuation treatment of ventilation openings, or air conditioning will be considered.

Y. Ebisu & Associates did not recommend the consideration of mitigation measures at this time for the two existing homes at The Fairways at Mauna Kea South, since the noise exposure category will be "Moderate," and there is the possibility of a 5 Ldn unit bias toward higher-than-actual values.

#### **4.3.2.2 Noise from Hotel Equipment**

Concerns have been expressed about the potential intrusion of noise from fixed mechanical equipment and mobile maintenance equipment operations at the proposed hotel on the natural background noise levels at Hapuna Beach Park. These types of equipment generally have noise levels of 65 to 75 dBA at 50 feet, particularly if powered by an engine. Depending on wave conditions and receptor distance from the shoreline, typical ambient noise levels near shoreline areas are in the order of 50 to 65 dBA. The louder equipment may be audible when used within 100 feet of the beach area, especially during days with little or no surf motion.

Hence, it will not be necessary to limit equipment noise to levels as low as 25 dBA, since existing background noise levels are probably higher on the beach. Typical setback distances from the hotel to the shoreline are estimated to be 200 feet or more, which should further decrease the risks of excessive noise levels. If necessary, fixed mechanical equipment can be muffled or shielded from the beach by terrain features or man-made structures. Noise impacts from mobile or portable ground maintenance equipment may be minimized by planting landscaping designed to require minimal usage of powered equipment, by scheduling maintenance operations during low beach occupancy periods, or by installing electrical outlets so that electric equipment may be substituted for engine powered equipment.

#### **4.3.2.3 Noise from Helicopters**

Tour helicopter facilities (landing pad, etc.) are not planned within the South Kohala Resort, so helicopter noise impacts are not expected to be associated with the project. The practice of tour helicopters over-flying the area is a potential cause of concern to the resort because of the low background ambient noise and the desire to present visitors and residents with the natural acoustic environment.

5.0 PUBLIC SERVICES AND FACILITIES

5.1 SCHOOLS

5.1.1 Existing Services and Facilities

South Kohala is served by two public and two private schools. Waimea Elementary/Intermediate School serves kindergarten through grade 9; high school students are bussed to Honoka'a High School for grades 9 through 12. The private schools are Hawaii Preparatory Academy (grades 1 through 12) and the Parker School (grades 8 through 12), both located in Waimea. Although Parker Ranch announced in early 1987 that the Parker School will begin to phase out and no longer accept new students, Hawaii Preparatory Academy is expected to expand to meet the region's needs. It is currently seeking government permits to allow construction of a new lower school for grades K through 5 in Keauhou.

Workers from elsewhere will have to be recruited by the new development to supplement the currently available labor pool. Since many of these employees are expected to reside outside of South Kohala--for example, in the Hamakua, North Kohala, North Kona, or South Kona districts--public school enrollment is expected to increase in these areas as a result of new employment generated by the proposed resort. Therefore, an analysis of the impact of the project on schools has to include consideration of services and facilities in all of the above-mentioned districts, as well as South Kohala.

State of Hawaii Department of Education (DOE) staff have confirmed the following enrollment figures for September 1986, and have indicated the current capacity of each school (personal communication with Minoru Inouye and Ed Matsushige of the DOE, July 30, 1987). Capacity is stated in terms of the present surplus or shortage of a specified number of classrooms. In cases of shortages, classes are accommodated in "portable" buildings or in other facilities such as the cafeteria, auditorium, etc.

School Enrollment and Capacity  
September 1986

| <u>School</u>           | <u>Grade Levels</u> | <u>Enrollment (9/86)</u> | <u>Capacity (Classrooms)</u> |                 |
|-------------------------|---------------------|--------------------------|------------------------------|-----------------|
|                         |                     |                          | <u>Surplus</u>               | <u>Shortage</u> |
| Hamakua:                |                     |                          |                              |                 |
| Honoka'a High & Elem    | K-12                | 1,085                    |                              | 4               |
| Laupahoehoe High & Elem | K-12                | 349                      | 1                            |                 |
| Pa'auilo Elem/Inter     | K-9                 | 208                      | 3                            |                 |
| North Kohala:           |                     |                          |                              |                 |
| Kohala High & Elem      | K-12                | 780                      |                              | 4               |
| South Kohala:           |                     |                          |                              |                 |
| Waimea Elem/Inter*      | K-9                 | 899                      |                              | 3               |

| <u>School</u>        | <u>Grade Levels</u> | <u>Enrollment (9/86)</u> | <u>Capacity (Classrooms)</u> |                 |
|----------------------|---------------------|--------------------------|------------------------------|-----------------|
|                      |                     |                          | <u>Surplus</u>               | <u>Shortage</u> |
| North Kona:          |                     |                          |                              |                 |
| Holualoa**           | K-6                 | 314                      | Up to capacity               |                 |
| Kahakai Elem         | K-5                 | 507                      | 3                            |                 |
| Kealakehe Elem       | K-5                 | 791                      |                              | 6               |
| Kealakehe Inter      | 6-8                 | 612                      |                              | 4               |
| South Kona:          |                     |                          |                              |                 |
| Honaunau Elem/Inter  | K-8                 | 419                      |                              | 2               |
| Ho'okena Elem/Inter  | K-8                 | 200                      |                              | 4               |
| Konawaena Elem       | K-6                 | 791                      |                              | 3               |
| Konawaena Inter/High | 7-12                | 1,455                    |                              | 23              |

\*K-8 as of 9/87; 9th graders transferred to Honoka'a.

\*\*K-5 as of 9/87; 6th graders transferred to Kealakehe Inter.

The public schools serving South Kohala are currently above capacity. The DOE projects that Waimea Elementary/Intermediate will have an enrollment of 1,042 in 1990, and 1,230 in 2006. Honoka'a School is projected to have 1,167 students in 1990 and 1,410 in 2006. (These figures do not account for the planned transfer of grade 9 students from Waimea to Honoka'a in September 1987.) To accommodate future enrollment, the Department of Education plans to construct four new classroom buildings at Waimea Elementary/Intermediate School in 1988, and six new classroom buildings at Honokaa High School in 1989 (letter from Margaret Y. Oda, Acting Superintendent, December 31, 1986).

According to Mr. Matsushige of the DOE, there are no plans in the near future for a school on the South Kohala coast, although there is a site in Waikoloa Village master planned for an elementary school.

With the exception of Holualoa and Kahakai Elementary, all of the schools in North and South Kona are over capacity, especially Konawaena Intermediate and High School. The DOE staff confirms that there are plans to eventually relocate Konawaena Elementary to another site in order to expand Konawaena High (the two schools are adjacent to each other), rather than build another high school in the Kona area.

In its proposed revised General Plan, the County of Hawaii recognizes the need for new school facilities and recommends several courses of action to the DOE, including development of a master plan for Waimea School which provides for an expanded intermediate school, and initiation of planning and site selection for a high school in South Kohala to meet regional growth needs.

### 5.1.2 Probable Impacts

#### 5.1.2.1 Impact During the Construction Period

Usually, population growth during construction is confined primarily to unaccompanied workers who relocate on a temporary basis. In most cases, workers from other islands return home on weekends. This is expected to take place during the South Kohala Resort construction, thereby minimizing any impact on the local schools. Community Resources, Inc. (CRI) poses a

theoretical cumulative scenario for the 1994-1998 period which foresees the possibility of construction workers from elsewhere settling in West Hawaii for awhile (see Chapter V, Sections 1.2.5.1 and 1.2.6.1). However, the timing and extent of other construction during this timeframe is extremely speculative, and the scenario is based on the most conservative or "worst-case" assumptions. It is unlikely that all of the estimated 190 out-of-area workers would choose to permanently relocate, as hypothesized by CRI; only a sustained construction boom would make this likely.

**5.1.2.2 Impact of Resort Residents**

The guests and residents of the proposed South Kohala Resort are expected to have little direct impact on schools. Hotel guests will be just temporary visitors, and single-family residences and multi-family units will be purchased primarily as temporary vacation residences or vacation rentals.

The State of Hawaii Department of Education uses the following factors to estimate the number of students generated by resort-type units (letter from Margaret Oda, December 31, 1986):

|                                   | <u>K-9</u> | <u>10-12</u> |
|-----------------------------------|------------|--------------|
| Single Family Units               | 0.10       | 0.05         |
| Condominiums (multi-family units) | 0.02       | 0.01         |

In general, the higher the cost of housing, the lower the number of school-aged children. Given these factors, it is estimated that in 1998, approximately 20 elementary/intermediate students and 10 high school students residing in South Kohala Resort will attend public schools in the area. It is anticipated that a relatively high percentage of the families will elect to send their children to private schools, either to Hawaii Preparatory Academy or as boarders elsewhere.

The above estimates are confirmed by figures provided by the DOE (letter from Charles Toguchi, October 5, 1987):

| <u>School</u>                  | <u>Grades</u> | <u>Approximate Enrollment</u> |
|--------------------------------|---------------|-------------------------------|
| Waimea Elementary/Intermediate | K-8           | 15 to 25                      |
| Honoka'a High                  | 9-12          | 0 to 10                       |

**5.1.2.3 Impact of On-Site Workers**

Educational facilities will be affected by secondary growth resulting from the new development. Employment generated by the South Kohala Resort will very likely lead to an increase in population islandwide, and workers directly employed by the resort will create an impact on those schools in areas within reasonable commuting distance.

To estimate this impact, Mr. Matsushige of the DOE suggests applying the following student generation factors. Depending on the residential area being analyzed, the exact factor used may be higher or lower, but the staff believes that these figures suffice in providing a general estimate.

|                    |      |
|--------------------|------|
| Elementary (K-6)   | 0.25 |
| Intermediate (7-8) | 0.05 |
| High School (9-12) | 0.10 |

It is projected that by 1993, when the hotel at South Kohala Resort opens, between 129 and 157 new housing units will be required to meet the initial demand of on-site workers. For subsequent years, the demand for new housing units is expected to range from 14 to 16 units per year, so by 1998, the combined total would be 200 to 234 new units. (See Chapter IV, Section 1.2.6.2.3, and Table V-22.) Applying the DOE student generation factors to these estimates gives us the following:

|                    | <u>Number of Students</u> |             |
|--------------------|---------------------------|-------------|
|                    | <u>1993</u>               | <u>1998</u> |
| Elementary (K-6)   | 32-39                     | 50-59       |
| Intermediate (7-8) | 6-8                       | 10-12       |
| High School (9-12) | 13-16                     | 20-23       |

Therefore, it is estimated that in 1993, as many as 60 students at all levels (most in the elementary grades) will come from new households established by South Kohala Resort on-site workers. By 1998, upon completion of the project, there will be up to 90 or more students from such households.

State and County planning and zoning policies--combined with a number of complex variables--will ultimately determine where the supply of new housing units will be located, and hence, which schools will be most affected. Looking at housing locations of current employees of the Westin Mauna Kea and Mauna Lani Bay Hotel, some inferences can be made about future residential patterns. As of now, newcomers tend to live either in North Kona or Waimea (see Table V-24). Sites for future housing development exist in Kealakehe (north of Kailua-Kona), Waikoloa Village, Waimea, and Kohala. A list of major proposed residential projects in West Hawaii is shown in Table V-25.

#### 5.1.2.4 Impact of Off-Site Workers

CRI's analysis (see Chapter IV, Section 1.2.5 and 1.2.6) also includes discussion of the impact of off-site population growth attributed to the South Kohala Resort development. Considering these off-site population impacts, CRI projects that in 1993, all new resort and non-resort jobs in the study area would generate demand for about 180 to 225 new housing units islandwide--about 95 percent of these in the West Hawaii study area. Subtracting the effects of non-resort jobs expected to come on-line anyway, the impact attributable to South Kohala Resort would be around 154 to 175 new units islandwide. Each subsequent year, the demand for approximately 26 to 29 new housing units would be generated by the resort. By 1998, the combined figures would total 291 to 317 units.

The following student enrollment figures can be inferred from CRI's projections:



|                    | <u>Number of Students</u> |             |
|--------------------|---------------------------|-------------|
|                    | <u>1993</u>               | <u>1998</u> |
| Elementary (K-6)   | 39-44                     | 73-79       |
| Intermediate (7-8) | 8-9                       | 15-16       |
| High School (9-12) | 15-18                     | 29-32       |

In summary, the enrollment of up to 70 new students in Big Island public schools in 1993 is expected to be attributable to South Kohala Resort off-site population impacts. By completion of the project in 1998, the impact on the schools will be up to 125 or more students.

The total impact of population growth on the schools--residents supported by new jobs attributable to South Kohala Resort (whether on-site or off-site)--is estimated as follows: up to 130 new students in 1993, and up to 215 or more students in 1998. Most of the impact would be felt by the elementary schools.

## 5.2 HEALTH CARE

### 5.2.1 Existing Services and Facilities

The Island of Hawaii has five hospitals which provide a range of medical services. Two State-operated hospitals serve the Kohala area--the Kohala Hospital in Kapa'au (North Kohala) and the Honoka'a Hospital. The Kohala Hospital is primarily a long-term care institution which also offers 24-hour emergency care. Staffed by three physicians, the facility has 10 acute care beds and 16 long-term beds. There are 35 beds in Honoka'a Hospital, 27 for acute care patients and 8 for long-term care. It is staffed by 13 to 14 physicians. Neither hospital is equipped to provide full patient services, and the facilities at Honoka'a are considered substandard because the building in which they are housed is thought to be too old and too small.

Kona Hospital is a "full service" health care facility; it has 53 acute care beds, 26 beds for long-term care, and an active staff of 36 physicians. Nevertheless, in 1985, a State of Hawaii Department of Health administrator described Kona Hospital's resources as inadequate for the needs of the existing regional population.

In Waimea, the private Lucy Henriques Medical Center provides outpatient health care, including emergency room, laboratory, and radiology services. Westin Hotel & Resorts contributed \$5 million to the Center in November 1986, to encourage long-range plans to upgrade the facility with a more complete range of medical services.

By the end of 1987, an emergency medical service vehicle will be stationed at the new fire station now under construction just south of the project site.

### 5.2.2 Probable Impacts

Existing conditions seem to indicate that, regardless of new development in the region, health care facilities in West Hawaii will require upgrading. South Kohala Resort visitors and residents will be able to seek care at Lucy

Henriques Medical Center or Kona Hospital. New induced and non-induced in-migrant population due to the proposed project will be about 601 in 1993, and an additional 532 in 1998, a total of 1,133. On-site resort residents will number approximately 21 in 1993 and increase to 424 by 1998. This resident population will generate demand for increased health care services. In addition, hotel and other transient accommodation guests will require health care. The daily visitor count is expected to average 467 in 1993, and 712 in 1998.

### 5.3 POLICE PROTECTION

#### 5.3.1 Existing Services and Facilities

Police services for South Kohala are headquartered in Waimea. Other police facilities in the area include the Kapa'au station, which serves North Kohala, and the Kona station in North Kona. Both the Waimea and Kapa'au police stations are of relatively recent construction, and both have room for additional staff. A police substation will be included in the Kohala Coast Fire Station currently under construction. This new facility is a public/private sector undertaking funded by the Kohala Coast Resort Association, of which Mauna Kea Properties is a member.

#### 5.3.2 Probable Impacts

A letter was received from Hawaii County Chief of Police Guy A. Paul, dated January 5, 1987, in response to the environmental impact statement preparation notice for the subject project (see Chapter XII). From the police standpoint, no adverse effect was foreseen.

However, earlier correspondence from Chief of Police Paul regarding the revised master plan for the nearby Mauna Lani Resort and development of the proposed Ritz-Carlton hotel at Mauna Lani specified a number of concerns about the impact of overall development in the region (letters of January 16, 1985 and November 7, 1986). A greater police workload was foreseen as a result of development at Mauna Lani and other Kohala coast resorts. The need for the establishment of a police substation was considered a possibility (one will be opened by the end of 1987), with the costs of capital outlays and additional personnel and equipment to be covered by revenue generated by the new developments.

The Police Department also predicted an increase in criminal activity associated with growth, as well as an increase in requests for police services in the resort area. (See Chapter IV, Section 1,2.7.3.1 of this report for a more detailed discussion of potential crime impacts.)

With increased traffic along the Queen Ka'ahumanu Highway, it is anticipated that additional police services will be required for traffic-related matters.

It is expected that demands on County police services will be partially offset by on-site services provided by resort security staff. As the visitor and resident population increases in the region, the need for more police personnel will have to be evaluated in the context of a County Police Department needs assessment.

## 5.4 FIRE PROTECTION

### 5.4.1 Existing Services and Facilities

Fire protection service for the South Kohala district is headquartered in a County-operated station in Waimea. The station provides 24-hour service and has a staff of six, supplemented by volunteers from Puako and Waikoloa Village and by a fire equipment operator from Kawaihae. The Waimea station is equipped with one engine, a 1,250-gallon water tanker, and a rescue van used by an emergency medical unit. Additional engines and a ladder truck are dispatched from Kailua-Kona when needed, and a privately owned fire truck manned by volunteers is stationed at the Westin Mauna Kea.

Ground-breaking for a new \$1.1 million emergency facility took place in April 1987. Located on a 1.1-acre parcel about just south of the proposed South Kohala Resort, it will include a fire station and a police substation. An emergency medical service vehicle will also be stationed at the new facility, expected to become operational by the end of 1987. Funding was provided by general obligation bonds floated by the County. By agreement between the County and the Kohala Coast Resort Association, the Association will pay the principal and interest on the bonds.

### 5.4.2 Probable Impacts

Development of the South Kohala Resort will lead to increased demand for fire protection services and facilities. It is anticipated, however, that fire protection problems will be minimized given construction of the new fire station and provided that building design and construction comply with current County fire and building code requirements. When the Kohala Coast Fire Station opens, response time to emergencies will be greatly reduced from 40 minutes to about 5 minutes.

Regional population growth, indirectly attributable to the subject project and other planned developments, is also expected to place greater demands upon fire protection services.

## 5.5 WATER SUPPLY

### 5.5.1 Existing Services and Facilities

By agreement between the County of Hawaii, Mauna Kea Properties, Inc., and Mauna Loa Land, Inc. (predecessor to Mauna Lani Resort, Inc.), a water system was developed using groundwater from a tract owned by the State of Hawaii, known as Lalamilo. The Lalamilo system was developed specifically to meet the needs of planned resort development in the South Kohala coastal region. The present supply capacity of the three Lalamilo wells and related pipelines and tanks is 2.44 mgd. Mauna Kea Properties' allotment from this amount is 1.0 million gallons per day (mgd). Part of this allotment is being used by the Villas and Fairways North at Mauna Kea. Based on current consumption pattern, projected usage at the resort is 0.55 mgd, thus giving Mauna Kea Properties a balance of 0.45 mgd for additional development. (Note: The Westin Mauna Kea, golf course, and Fairways South use water from other sources and are not included in the 1.0-mgd allotment.) See Figure V-6.

**LEGEND:**

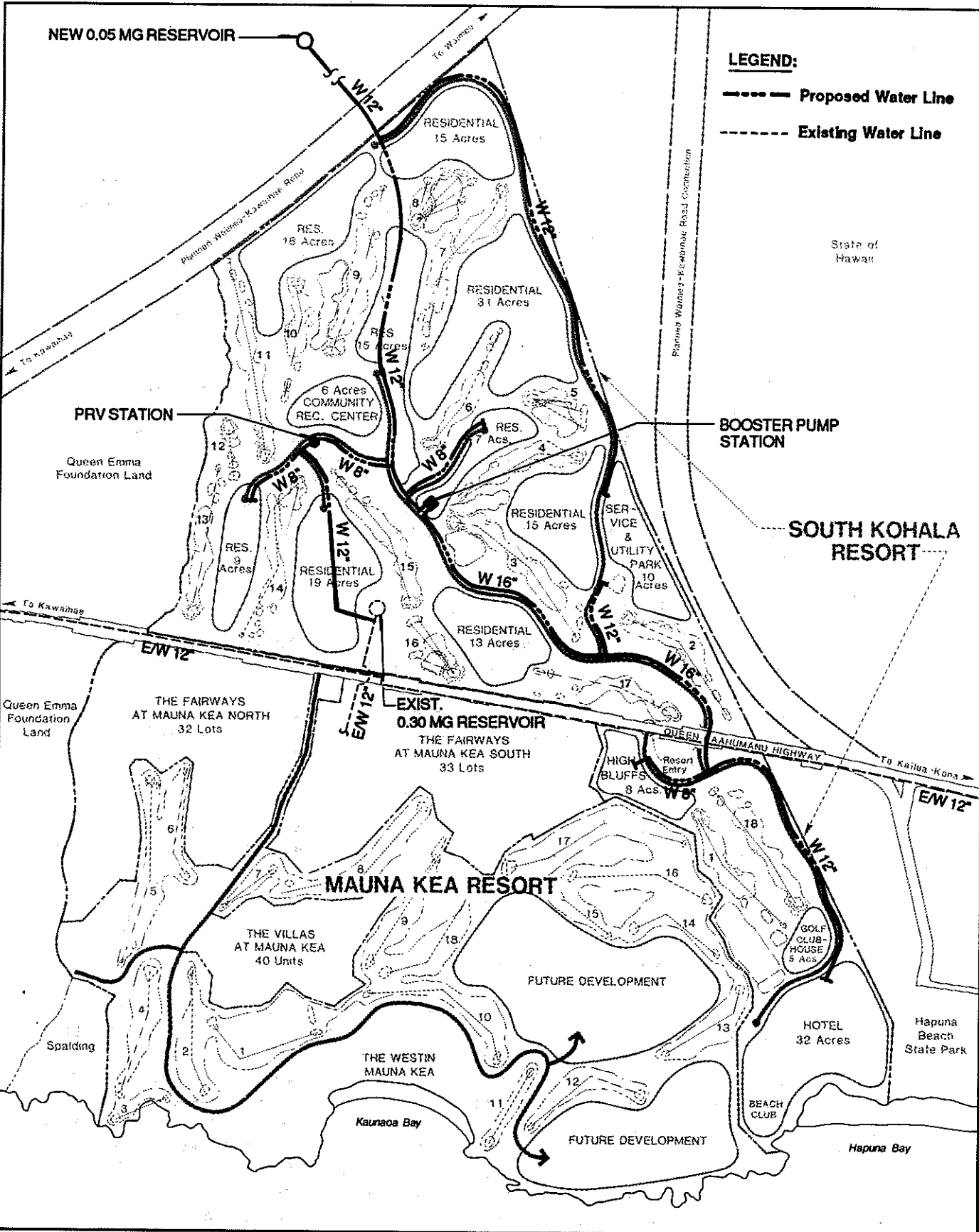
----- Proposed Water Line

----- Existing Water Line

State of Hawaii

**BOOSTER PUMP STATION**

**SOUTH KOHALA RESORT**



800 400 0 800 1600

SCALE IN FEET

Prepared By: **BELT COLLINS & ASSOCIATES**  
Honolulu, Hawaii September 1987



**NORTH**

**Figure V-6  
WATER DISTRIBUTION SYSTEM**

**SOUTH KOHALA RESORT**  
Kohala Coast Resort Region • South Kohala, Hawaii

## 5.5.2 Probable Impacts and Mitigation Measures

### 5.5.2.1 Projected Resort Demand

Water requirements for the South Kohala Resort have been estimated on the basis of the planned number of hotel rooms, residences, and commercial units. The County standard for maximum water demand is 600 gallons per day (gpd) per unit for resort units (hotel, single- and multifamily) and 4,500 gpd per acre for commercial use. By applying these standards to the first phase of construction (hotel, golf course and clubhouse, tennis club, beach club, and 15 single-family residential units), it is estimated that the daily demand, based on 100 percent occupancy, will be 0.261 mgd in 1993, when this phase is completed. By 1998, when the remainder of the project is completed (450 multi-family units and 90 additional single-family units), the water demand will be an estimated 0.6365 mgd.

In order to make a more realistic projection, however, it is necessary to look at the actual water usage of comparable resort facilities--i.e., luxury resorts in arid environments. The Westin Mauna Kea is one comparable example; its average consumption rate is about 1,000 gpd per unit, which includes water for landscaping. It was originally hoped that usage at the South Kohala Resort hotel could be lower if brackish water was used to irrigate the landscaping. However, experience at the Mauna Lani Resort showed that with the exception of salt-tolerant grass on the golf course and a few other species, very few plants can tolerate brackish water irrigation. Flowering ornamentals commonly seen in resort settings are especially sensitive.

The residential units at Mauna Kea Resort, on the other hand, are not as relevant to the South Kohala Resort situation. There are only 40 multi-family residential units (The Villas) at Mauna Kea; whereas, 450 of the planned 560 units at South Kohala Resort will be multi-family. In terms of density and price, the South Kohala Resort multi-family residential units will be more like the condominiums at Mauna Lani Resort than the Villas. Development density in the Villas is 1.3 units per acre; the average unit price is slightly over \$1,000,000. Planned density in the South Kohala Resort multi-family projects is 5 units per acre, and prices are expected to average \$500,000 to \$600,000. At Mauna Lani Point and Mauna Lani Terrace, average density is 6 units per acre. The average price of units at Mauna Lani Terrace was initially about \$450,000; prices at Mauna Lani Point are higher mainly due to inflation.

Likewise, the existing single-family units at Mauna Kea Resort have much lower densities than what is planned for South Kohala Resort. The overall project density at the Fairways at Mauna Kea South and North are about 0.5 and 0.8 lots per acre, respectively. In comparison, planned density in the High Bluffs project is 1.4 lots per acre, and in the mauka single-family projects, 2.0 lots per acre. Hence, with densities two or three times lower than the South Kohala Resort projects, the Mauna Kea Resort single-family residential units are not considered comparable and have limited value in terms of projecting water usage.

The County of Hawaii Department of Water Supply has indicated that the 4,500-gpd standard for commercial use may not necessarily apply to dry areas like South Kohala and that a comparable commercial development be used as a basis for estimating water demand at South Kohala Resort.

An examination of actual water usage at the Westin Mauna Kea, Mauna Lani Resort, and Waikoloa Resort, as well as several developments at Ka'anapali Resort on Maui, indicate that an average demand of 1,000 gpd per unit would be a more realistic figure for South Kohala Resort hotel and residential units. At Mauna Lani Resort, the usage at the hotel and multifamily developments are at the higher end of the range, while average water usage at the Sheraton Waikoloa and Waikoloa Village is at the lower end. (The density at Waikoloa is much higher than at either Mauna Lani or Mauna Kea Resorts.) For this analysis, the water consumption at six hotels, two multifamily condominiums, and two single-family residential projects at Ka'anapali were also examined. The group average for the hotels was approximately 400 gpd per unit. For the multifamily and single-family projects, it was in the 800 to 1,200 gpd range. Ka'anapali Resort is not quite comparable to the South Kohala Resort situation since the density is higher and the landscaping is not as extensive, but the actual water consumption figures show that the 600 gpd per unit standard is too low.

Average water consumption rates for commercial facilities at Mauna Lani and Ka'anapali Resorts average 4,800 gpd per acre. This is somewhat higher than the County's maximum water demand standard of 4,500 gpd per acre.

#### **5.5.2.2 Secondary Impacts**

The secondary impacts of resort development are recognized, specifically the increase in population due to employment generated by South Kohala Resort and other planned developments in the region. There will undoubtedly be an increase in population in the Waimea area, as well as in North Kohala and Kona. These communities will require additional services, including potable water supply and distribution facilities.

#### **5.5.2.3 Proposed Mitigation Measures**

##### **5.5.2.3.1 Development of Additional Water Source**

As mentioned previously, a balance of 0.45 mgd from the Lalamilo system is available to Mauna Kea Properties for additional development. It will be made available to South Kohala Resort as well as to remaining Mauna Kea Resort projects. It is projected that there will be a sufficient water supply for South Kohala Resort through 1993. After this date, more water may be available from an expanded Lalamilo system. (A fourth well, which would increase supply capacity to 3.88 mgd, has been drilled but has not yet been added to the system. Five additional well sites have been purchased by Mauna Lani Resort on private land in the Lalamilo area.) However, because of competition from other users, the water may not be available to South Kohala Resort. Additional water source, storage, and transmission facilities will have to be developed off-site to meet the projected demand for the total project.

In 1981, Belt Collins & Associates conducted a study of groundwater resources in an 85-square-mile area which includes the watershed above Waimea, a portion of the South Kohala plain, and the coastline from Kawaihae to Puako (Nance, T. November 1981. A proposal to develop groundwater for domestic use at Puukawaiwai, South Kohala, Hawaii). Conclusions of the study were as follows:

- o The amount of groundwater recharge is estimated to be 24 mgd.
- o Allowing for some expansion of the County's surface water system in Waimea, the streamflow component of the recharge may be reduced to about 20 mgd as the long-term regional groundwater recharge.
- o Groundwater development should be limited to a maximum of two-thirds of recharge or 13 mgd to preserve the integrity of the basal lens in South Kohala.
- o Upon completion of planned expansions of the Lalamilo water system and private, nearshore brackish water irrigation systems, total groundwater pumpage will be 6-7 mgd; this will leave approximately 6 mgd that can be safely developed in addition to planned expansions.
- o A site at Pu'ukawaiwai along the Waimea-Kawaihae Road (at an elevation of about 1,250 feet) was recommended for new potable wells. This was considered the best location from the standpoint of installation cost and operational flexibility.

Hence, current and foreseeable pumpage amounts to a fraction of the total groundwater recharge, meaning that more pumpage could be maintained without threatening the integrity of the groundwater supply. The implications are that potable water sources are available for future developments in the region such as South Kohala Resort.

If the demand based on the 1,000-gpd standard is accepted, and assuming that property rights for water, access, etc. could be obtained from various property owners, off-site water development for the second phase might be as follows:

- a. 1.0-mgd well at the 1,250-foot elevation to provide additional water source.
- b. 0.30-mg reservoir to provide additional storage at the 1,250-foot elevation.
- c. Water main connecting the 1.0-mgd well and 0.300-mg reservoir to the existing 0.002-mg and 0.250-mg County of Hawaii reservoirs adjacent to the Kawaihae-Waimea Road for additional transmission capacity.
- d. A 0.50-mg reservoir at the 720-foot elevation connecting water line from the reservoir to the project site to provide water to the higher elevation portion of the South Kohala Resort.

#### 5.5.2.3.2 Water Conservation Measures

To conserve water resources, the following measures will be considered for implementation at the South Kohala Resort.

**Landscaping and Irrigation:** Plant varieties especially adaptable to the dry environment, including appropriate native flora common in the area, will be selected to landscape the grounds of the hotel, residences, and other

facilities. Certain areas can be left in their natural state, interspersed with pockets of landscaping, thus decreasing irrigation requirements. Since the golf course will be irrigated with brackish water and treated sewage effluent, associated landscaping will need to be salt tolerant. Watering will be limited to the early morning and late afternoon hours to minimize evaporation (and when fewer hotel guests, residents, and others are using the facilities). Drip irrigation is another alternative.

**Facility Design:** The installation of plumbing fixtures with water conservation features will be considered. These may include toilets designed to use less water and showerheads that minimize the flow of water.

**Education of Residents and Guests:** Residents and guests can be informed in a low-key manner about the need to conserve water. People are often not aware that they are wasting water, especially if cost of the water is not meaningful. The developer can encourage voluntary conservation in a number of ways that do not detract from the luxury resort experience.

## **5.6 WASTEWATER TREATMENT AND DISPOSAL**

### **5.6.1 Existing Services and Facilities**

Sewage from the Mauna Kea Resort, Mauna Lani Resort, Waikoloa Beach Resort, and the commercial/condominium area of Waikoloa Village is collected and treated at private wastewater treatment plants. All other sewage in North and South Kohala is handled by private individual systems such as cesspools.

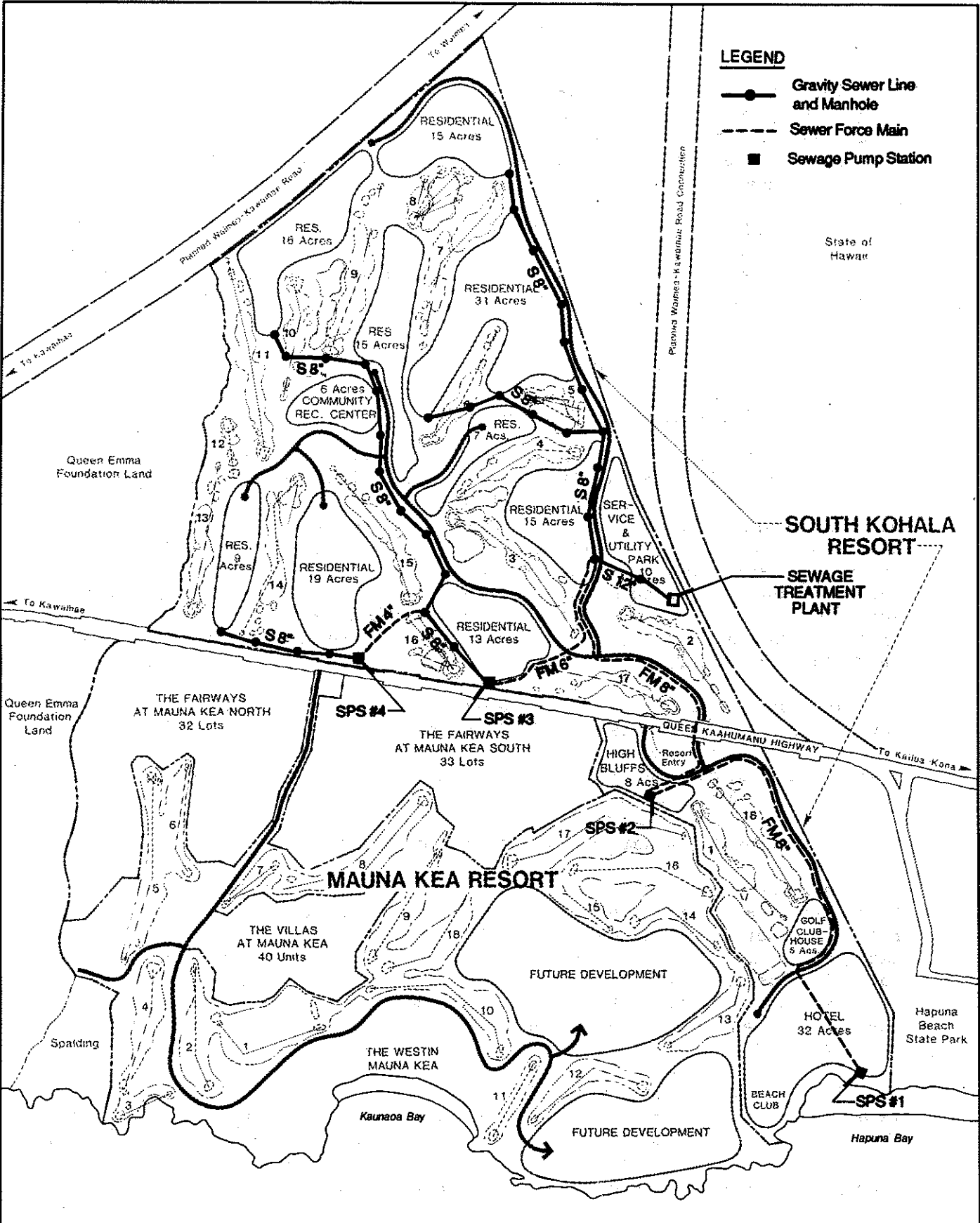
### **5.6.2 Probable Impacts and Mitigation Measures**

South Kohala Resort will be served by its own private sewage collection system and wastewater treatment plant. Figure V-7 shows the planned sewage collection system consisting of gravity lines, force mains, and sewage pump stations. Sewage will be treated to the secondary level at the wastewater treatment plant. The sewage collection system will be designed to County of Hawaii standards. The wastewater treatment plant will be constructed to meet all State and Federal water quality and public health standards.

When completely developed, the resort could generate approximately 0.37 mgd of sewage requiring disposal. This is a conservative estimate based on the maximum number of units to be built and assuming 100 percent occupancy; neither of these conditions is likely to occur. The sewage will be collected and carried to the 0.4-mgd capacity sewage treatment plant for secondary treatment and disposal, primarily through golf course irrigation. When the quantity of effluent exceeds the irrigation needs, excess effluent will be disposed of in injection wells located on the sewage treatment plant grounds.

It is expected that once the development is completed, irrigation requirements will greatly exceed the amount of effluent available. Initially, brackish water wells will be the sole source of irrigation supply, but as the number of residents and visitors increases, treated sewage will supplement brackish well water for golf course irrigation. (See Chapter IV, section 4.2.2.2 of this EIS for a discussion of the impact of irrigation with treated sewage effluent.)





**LEGEND**

- Gravity Sewer Line and Manhole
- - - Sewer Force Main
- Sewage Pump Station

800 400 0 800 1600

SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii September 1987



**Figure V-7  
 SEWAGE COLLECTION SYSTEM**

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

The resort nursery will be using the sewage sludge as fertilizer on the site. Sludge at Mauna Kea Resort is dried in drying beds and then stored for future use; the process will be the same at South Kohala Resort. According to Ray Seaver, Director of Engineering at the Westin Mauna Kea, about two cubic yards of sludge is produced annually at the wastewater treatment plant.

All developers must show evidence of provisions for safe and reliable sewage treatment plants or individual systems before being issued a permit to operate. Review by the County and/or State of Hawaii Department of Health can assure that any necessary mitigation measures are made conditions to the permit.

## **5.7 SOLID WASTE DISPOSAL**

### **5.7.1 Existing Services and Facilities**

Refuse collection and disposal facilities in the North and South Kohala Districts consist of a County-operated landfill in Waimea and compactor-transfer stations at Hawi, Puako, and Waimea. The main landfill at Kealakehe, near Kailua-Kona is projected to reach capacity in 1990, and serves both Kohala and Kona. Hawaii County does not provide refuse collection service to individual residences or businesses in the area. Each household must take its refuse to one of the compactor-transfer stations, landfills, or open dumps mentioned above. Refuse collected by private contractors cannot be deposited in the compactor containers; instead it must be trucked to either the Waimea or Kailua-Kona landfill.

The Hawaii County Sewers and Sanitation Bureau is planning to develop a new 300-acre public sanitary landfill at Puuanahulu, east of Mamalahoa Highway in North Kona. The new site is expected to be operational in about three years to accommodate solid waste generated by planned resort development in South Kohala (Kuba; March 24, 1987).

### **5.7.2 Probable Impacts and Mitigation Measures**

The Westin Mauna Kea currently uses its own compactor carried on a tractor/trailer to transport ground maintenance cuttings and branches, hotel rubbish, paper goods and boxes, etc. to the landfill. Two to three loads are handled per week, each load having a volume of 20 cubic yards and weighing about 10 tons. It is expected that this same equipment will be used to handle solid waste generated by the South Kohala Resort. It will be disposed of at the new Puuanahulu landfill or other County operated landfills as new sites are developed.

Resort developers can do little to reduce the per capita solid waste generation rate within their projects and have even less control over the amount of waste generated as a result of the secondary growth stimulated by development. Theoretically, the County could influence this generation rate through regulations regarding recycling and packaging.

The impacts of solid waste disposal can be mitigated. In its planning for a new sanitary landfill site, the County will be required to prepare an environmental impact statement, and this document will explore the design provisions necessary to avoid or minimize adverse impacts.

## 5.8 ELECTRICAL POWER AND COMMUNICATIONS

### 5.8.1 Existing Services and Facilities

Electrical power of the island of Hawaii is provided by the Hawaii Electric Light Company (HELCO), a subsidiary of Hawaiian Electric. Its system has a total capacity of 126 megawatts (letter of December 24, 1986 from HELCO). The majority of the power consumed is generated in plants using conventional fossil fuels, but HELCO continues to support the development of alternate energy sources to decrease this dependence on imported oil. Through agreements with various sugar companies, power is generated using bagasse-fired boilers. A private enterprise plans to develop a new geothermal plant by 1989. Also, private companies are studying the feasibility of developing hydroelectric power at stream sites along the Hamakua Coast.

Following are HELCO's projections of power generated by type of resource, renewable and non-renewable:

|                         | <u>% 1986</u> | <u>% 1993</u> |
|-------------------------|---------------|---------------|
| Fossil fuel             | 53            | 40            |
| Biomass (bagasse, wood) | 41            | 30            |
| Geothermal              | 3             | 25            |
| Hydroelectric           | 2             | 3             |
| Wind                    | 1             | 2             |
| TOTAL                   | 100%          | 100%          |

The Big Island transmission system consists primarily of 69 KV lines, but two areas--Puna and North Kohala--are served by lines with 34.5 KV capacity. Most areas have a looped system which allows an alternate feed to the user when storms or accidents damage a transmission line. Exceptions to this are along the road to Pahoa in the Puna District and in North Kohala, where only a single 34.5 KV transmission line is provided.

Telephone service to the South Kohala Resort area is provided by Hawaiian Telephone Company, and a telephone substation is located in the service support area. Telephone signals are received via microwave dish.

Cable television (CATV) service is provided by American Cable TV Investors 4, Ltd.

### 5.8.2 Probable Impacts and Mitigation Measures

Based on present rates of energy use by residential and hotel/condominium units, the existing resorts in South Kohala resorts (Mauna Kea, Mauna Lani, and Waikoloa) require a total of about 31 million kilowatt hours per year. Approximately 13 million kilowatt hours per year will be required by the South Kohala Resort when it is completed. Preliminary information from the utility company indicate there is sufficient capacity to serve the development. Overall, the new resort project and associated secondary growth (in-migrating on-site workers) will increase energy consumption in the Kohala area by about 15.3 million kilowatt hours per year. Projected electrical power requirements for the proposed development are shown in Table V-34). It

Table V-34

Electrical Power Requirements of the  
Proposed South Kohala Resort

| <u>U s e</u>                                           | <u>Total<br/>Units</u> | <u>Estimated<br/>Consumption<br/>Rate<br/>kwh/yr/unit</u> | <u>Peak Demand<br/>kw/unit</u> | <u>Use<br/>kwh/yr</u> | <u>Demand<br/>kw</u> |
|--------------------------------------------------------|------------------------|-----------------------------------------------------------|--------------------------------|-----------------------|----------------------|
| Hotel                                                  | 350                    | 18,000                                                    | 3                              | 6,300,000             | 700                  |
| Multifamily                                            | 450                    | 12,000                                                    | 4                              | 5,400,000             | 900                  |
| Single Family                                          | 110                    | 12,000                                                    | 6                              | <u>1,320,000</u>      | <u>330</u>           |
|                                                        |                        |                                                           | Subtotal                       | 13,020,000            | 1,930                |
| Single Family -<br>Secondary Growth<br>(New Residents) | 234                    | 9,600                                                     | 3                              | <u>2,246,400</u>      |                      |
|                                                        |                        |                                                           | TOTAL                          | 15,266,400            |                      |

is understood that other planned developments, especially the 1,200-room Hyatt Waikoloa, will further increase the electrical power requirements in the region.

With the 69-KV line connecting the Waikoloa substation with the Waimea-Kawaihae line, looped service is provided to South Kohala. This significantly increases the reliability of service to all of the resorts on the coast. Since the proposed South Kohala Resort lies adjacent to this looped service, power outages are not expected to occur very often.

The electrical power consumption estimates shown in Table V-3<sup>4</sup> are based on current average usage rates. They do not take into account any energy conserving design features that could be incorporated into the project, such as waste heat recovery from air conditioning and refrigeration, solar water heating, natural ventilation and lighting, wind powered generators driving pumps on the deep wells supplying water, or on-site photo-voltaic systems. The feasibility of these and other methods will be considered in the design of the new resort facilities.

Area lighting will be installed along the project roadways. This lighting will conform to the local ordinance prohibiting any light from illuminating areas above the horizontal plane.

## **6.0 RECREATIONAL RESOURCES AND FACILITIES**

### **6.1 EXISTING RESOURCES AND FACILITIES**

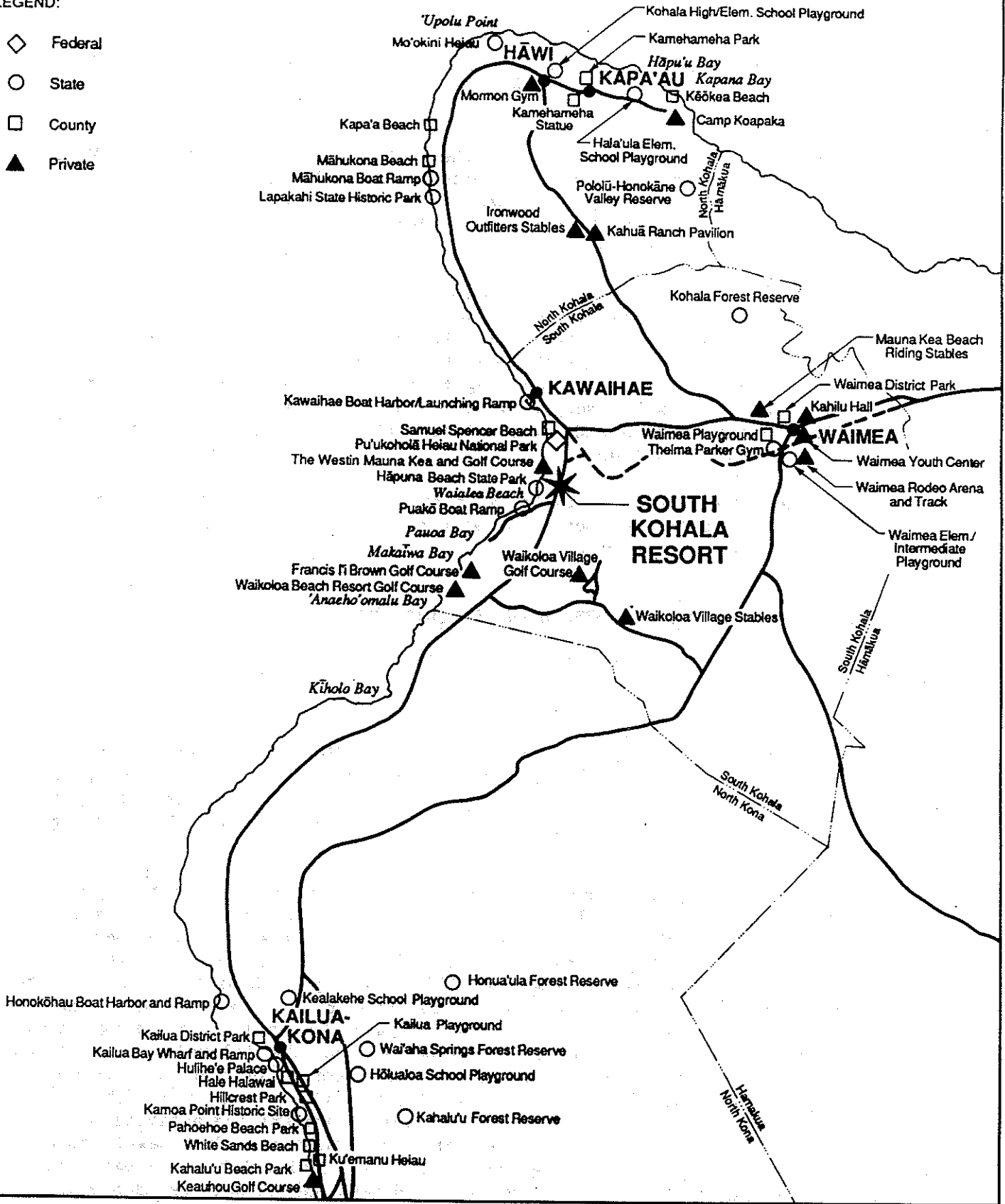
#### **6.1.1 Overview**

Recreational resources and facilities in West Hawaii include beaches, golf courses, tennis courts, riding stables, historic sites, trails, small boat harbors, and other amenities and attractions. The location of selected facilities in North Kohala, South Kohala, and North Kona are shown on Figure V-8.

**Beaches and Other Shoreline Areas.** According to a 1978 survey prepared for the State Recreation Plan (State of Hawaii, DLNR, 1980), participation in swimming and sunbathing -- activities usually associated with sand beaches -- constituted a slightly higher proportion of all Big Island recreation uses (18%) than was the case statewide (16%). And yet, Hawaii County has the lowest ratio of park-related beaches to population of all counties in the state: 0.2 acres per 1,000 population, compared to a statewide average of 0.4 acres per 1,000. West Hawaii has 69 percent of the island's park-related beach acreage, and while 44 percent of all recreation uses in the county occurred in coastal areas, 63 percent of Kona and 76 percent of Kohala uses involved shoreline activities. These figures represent the activities of all users, not just residents of these districts. Moreover, West Hawaii recreation resources were used by Big Islanders from all districts. For example, 18 percent of the recreational activities of Hamakua-North Hilo residents and 11 percent of those of Hilo residents took place in the North/South Kohala region. The State Recreation Plan attributes this pattern to the attractiveness of West Hawaii's shoreline areas.

LEGEND:

- ◇ Federal
- State
- County
- ▲ Private



7 3.5 0 7

SCALE IN MILES

Prepared By: BELT COLLINS & ASSOCIATES

Honolulu, Hawaii

September 1987



NORTH

Figure V-8  
RECREATIONAL FACILITIES - NORTH KOHALA,  
SOUTH KOHALA, AND NORTH KONA

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

Hapuna Beach State Recreation Area and the County's Samuel Spencer Beach Park are the principal beach parks in the immediate vicinity of the proposed South Kohala Resort. Both offer white sand beaches, picnic and camp grounds, as well as rest room and parking facilities. Other County beach parks are located in the Kailua area and at Mahukona, Kapa'a, and Keokea. In addition, public access is provided to white sand beaches at Kauna'oa Bay by Mauna Kea Properties, at Kalahuipua'a by Mauna Lani Resort, and at Anaeho'omalua Bay by Waikoloa Beach Resort. Public facilities are established and maintained by the resorts at both Kalahuipua'a and Anaeho'omalua. Wailea Bay, an undeveloped white sand beach adjacent to Hapuna Bay, is designated as a Marine Life Conservation District.

In addition to these beaches, the North Kohala coast features miles of rocky shoreline offering excellent fishing, squidding, limu and opihi gathering, snorkeling, and scuba diving. The usually calm waters and rich coral cover along the lava-edged coastline provide superb habitats for marine life. Waters offshore are ideal for surfing, windsurfing, and sailing.

**Historic Parks and Sites.** A large state historic park is located at Lapakahi on the North Kohala coast. It encompasses an extensive archaeological complex, accessible to the public by trails and explanatory signs. Pu'ukohola Heiau at Kawaihae, maintained by the National Park Service, is another significant site -- it is here that Kamehameha I consolidated his control over the island of Hawaii. In the early 1970s, Laurance Rockefeller and Mauna Kea Properties were instrumental in having Pu'ukohola placed on the National Register of Historic Places and participated in efforts to restore and interpret the site. Other major heiau in the region include Mo'okini Heiau and Mailekini Heiau. MKP has assisted with the interpretive and public information programs for these sites, as well as with the establishment of docent programs.

Private developers in the region have also been instrumental in the preservation of historic sites on their lands. Paved walkways and interpretive signs are provided at Anaeho'omalua and Kalahuipua'a, where ancient Hawaiian fishponds have been restored, and major petroglyph fields and other interesting archaeological sites preserved. Well preserved portions of Ala Loa (King's Highway) cross the two resort properties. Ala Loa is part of an old Hawaiian trail system along the West Hawaii coast that still offers unique hiking opportunities today.

**Golf Courses.** There were nine golf courses on the Big Island in 1980 (State of Hawaii, DLNR, State Recreation Functional Plan, December 1985). Since then, two more have been built -- one at Mauna Lani Resort and one at Waikoloa Beach Resort. Golf courses at the three Kohala coast resorts and the one at Waikoloa Village are open to the public.

**Boating Facilities.** West Hawaii is acknowledged as one of the premier deep-sea fishing spots in the world. The proposed South Kohala Resort is in close proximity to small boat harbors and ramps at Honokohau and Kawaihae, and boat ramps are located at Puako and Mahukona.

**Other Facilities.** There are sports/playground facilities at Kamehameha Park in Kapa'au, Waimea Park, and Honoka'a Park, all run by the County. Camping and horseback riding can be enjoyed in the native rainforest of Kalopa State Park near Honoka'a, or at Mauna Kea State Recreation Area on the slopes of Mauna Kea.

## **6.1.2 Hapuna Beach State Recreation Area**

### **6.1.2.1 Description of the Park**

The proposed South Kohala Resort will be located adjacent to Hapuna Beach State Recreation Area, which includes over 60 acres of already developed facilities along approximately 1,400 feet of beach frontage. (The developed facilities are known as Hapuna Beach State Park.) About 2,000 feet long in total, Hapuna is the widest white sand beach on the island -- more than 200 feet wide during the summer months, narrower in the winter when high surf erodes it considerably. Park amenities include two picnic pavilions, three comfort stations, three outdoor showers, paved parking for 215 automobiles and 5 buses, walkways, and landscaping. Six A-frame cabins are available for campers just mauka of the parking lot; camping is no longer allowed in other parts of the complex, as it was before park improvements were made. See Figure V-9 for a map of park facilities in relation to the proposal development.

Hapuna is probably the most popular beach park on the Big Island, offering opportunities for sunbathing, swimming, snorkeling, and scuba diving. The southern end of the beach is particularly good for bodysurfing. (State law does not permit board surfing.) Fishing is popular off the rocky points bordering the beach. However, prominent signs posted on the beach warn the public about the hazards of strong current conditions. During the winter months (October through April), high surf striking the beach generate a powerful shorebreak and shifting rip currents. These rip currents can quickly tow an unsuspecting swimmer away from the beach. With these conditions, and because there is no full-time, professional lifeguard coverage, Hapuna has had more drownings than any other developed beach park in the state.

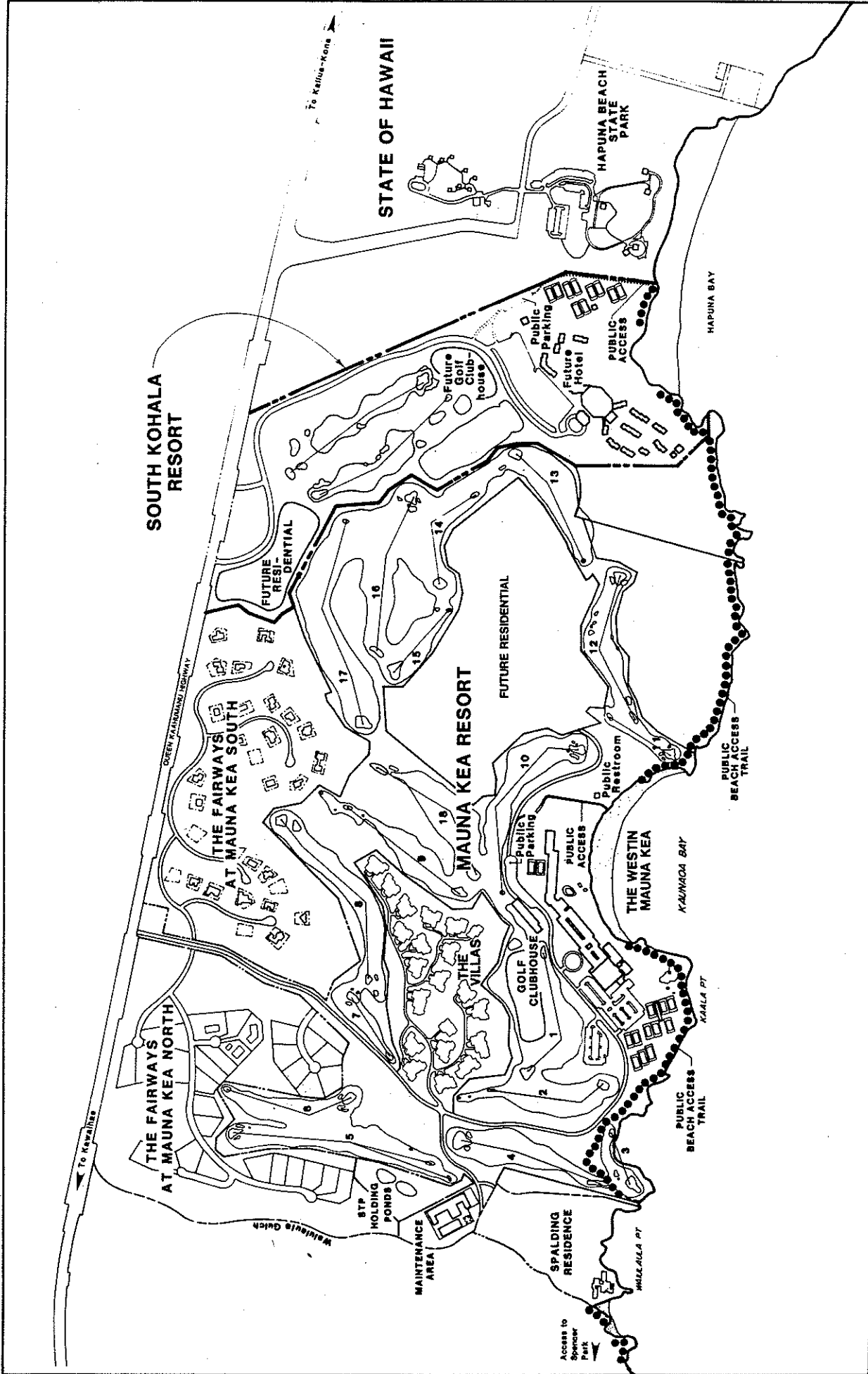
### **6.1.2.2 History of Hapuna Beach and Kauna'oa Beach**

Hapuna Beach is divided in two by a rocky promontory known as Ihumoku Point. This landform divides the property mauka of the beach by ownership: land south of the point is owned by the State of Hawaii as part of the Hapuna Beach State Recreation Area, while land north of the point and mauka of the beach is privately owned and part of the proposed South Kohala Resort project. Roughly one-third of the sandy beach area fronts the parcel owned by Mauna Kea Properties and two-thirds front the Hapuna State Beach Park grassed area.

As part of the ahupua'a of Lalamilo, the public park lands were once owned by King Lunalilo. They became part of crown lands to which the Territory, and later the State, succeeded in ownership. By Executive Order of December 27, 1951, the State of Hawaii transferred 34.3 acres of the parcel's shoreline frontage to the County of Hawaii for use as a public park. The land was returned to the State in 1965, and has been managed by the Department of Land and Natural Resources since then. With some land deeded to the State by Parker Ranch, the park area grew to about 70 acres.

Lands mauka of the northern portion of Hapuna Beach and Kauna'oa Beach were owned by the Richard Smart Personal Trust and then leased to Mauna Kea Properties and its predecessor entities. Mauna Kea Properties now owns the land in fee.





**Figure V-9**  
**PUBLIC ACCESS**  
**SOUTH KOHALA RESORT & ADJACENT LANDS**  
 SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii

400 200 0 400 800 1200 1600

SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES

Honolulu, Hawaii



The lands fronting neighboring Kauna'oa Beach were also formerly owned by the Richard Smart Personal Trust, leased for development of the Mauna Kea Resort, and only recently sold in fee to Mauna Kea Properties. Before the Mauna Kea Beach Hotel opened in 1965, access to Kauna'oa was by old foot trails and dirt roads which were cleared by the Army Corps of Engineers during World War II. (The Queen Kaahumanu Highway, which provided the first roadway link between Kona and Kauna'oa, was not completed until 1975.) Prior to 1965, Kauna'oa was largely used by Parker Ranch employees and guests, with fishing the main activity. In those days, the Kohala population consisted predominantly of long-time residents whose primary recreational activities were somewhat less dependent on sandy beach areas. With the increasing threat of a Kohala Sugar shutdown and the consequent need for new jobs, there were few immediate complaints about the hotel's intent to market an exclusive resort facility. Also at that time, governmental controls such as the Coastal Zone Management law (H.R.S. Ch. 205A, enacted in 1975) had not yet been enacted.

Subsequently, however, the changing population and Hawaiian insistence on access to traditional trails resulted in friction between the hotel and the wider community over Kauna'oa Beach. Legal action was taken against Laurance Rockefeller, original owner of the Mauna Kea Beach Hotel, over access to the Kawaihae-Puako Road and Kamehameha Trail with the filing of three class action suits (Akau, et al., v. Mauna Kea Properties, Inc., et al.; Akau, et al., v. State of Hawaii, et al.; and Akau, et al., v. County of Hawaii, et al.) The suits sought to settle the claims of all persons seeking access to the Kamehameha Trail, the Kawaihae-Puako Road, and the intersecting trails and paths to reach the beaches, tidal areas, and ocean between Hapuna State Beach Park on the south and Samuel Spencer Park on the north, including the property which is the subject of this EIS.

Mauna Kea Properties purchased Laurance Rockefeller's interests in 1979 and settled the actions in a Settlement Agreement filed with the Circuit Court on August 3, 1981. Following notice to the class action members and public hearing, a Final Judgment of Dismissal With Prejudice was entered on October 8, 1981.

Under the agreement, Mauna Kea Properties and other defendants provided nature trails, paths, and easements from Hapuna State Beach Park to Samuel Spencer Park, except across two parcels owned by the Roth family interests. The Settlement Agreement incorporated an Easement Agreement with the County of Hawaii (August 21, 1979) that satisfied a condition imposed by the County for approval of a subdivision of the property. The condition required vehicular access through Mauna Kea Resort, ten public parking stalls, and a pedestrian access trail from the parking area to Kauna'oa Beach.

#### **6.1.2.3 Park Development Plan**

Only a fraction of the total area available for park use is developed to date. More than 450 acres of State land adjacent to the park is available for future expansion -- equivalent to more than seven times the size of the existing park. A master plan was prepared in 1970, providing the concept for incremental development of the entire Hapuna complex (Charles Yoon & Associates, August 1970). Various improvements have been added on an incremental basis as part of a major park development program. Included in plans for the first phase, but not yet implemented, are additional picnic grounds, as well as campsites, located just south of Hapuna Beach. Phase two plans call for development of park facilities fronting the 1,400-foot long beach at Wailea Bay.

Wailea, commonly known to local residents as Beach 69 (named after the number on the utility pole at the entrance), is one of the island's most beautiful white sand beaches. Because it offers more sheltered conditions than those at Hapuna, Wailea is preferred by many families with children. Swimming, snorkeling, scuba diving, surfing, bodysurfing, windsurfing, and sailing are popular activities. Except during periods of high surf in the winter, favorable wind and ocean conditions are the norm. Wailea has no facilities, other than a portable toilet, and access to the beach is via a rocky dirt road.

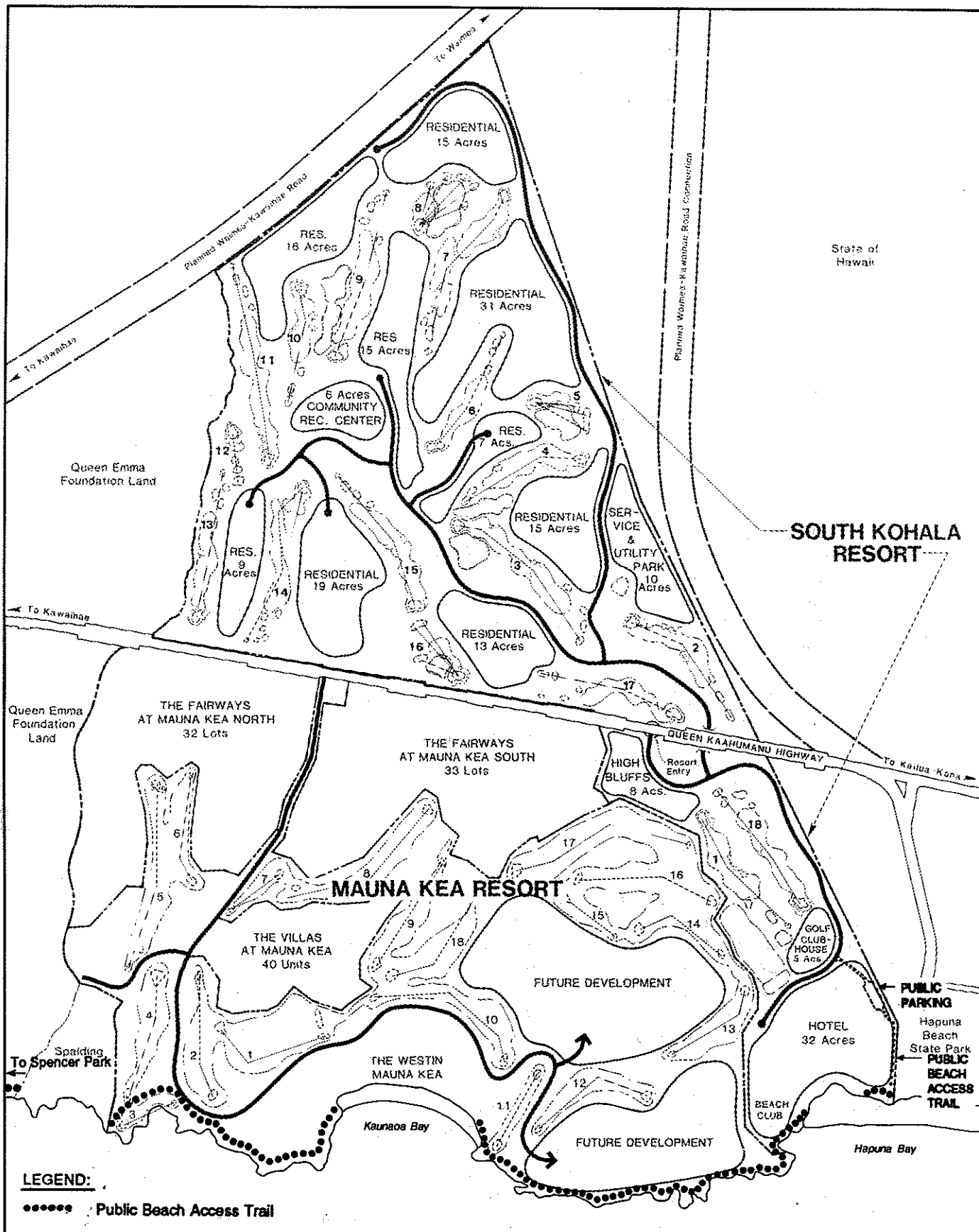
#### 6.1.2.4 Shoreline Access

Most users gain access to Hapuna Beach through the park, using the convenient parking facilities. As previously explained, except for two interruptions caused by the parcels owned by the Roth Family interests, a shoreline trail starting at Spencer Beach Park and ending at the north end of Hapuna Beach traverses the property owned or controlled by Mauna Kea Properties. The shoreline trail can also be joined at Mauna Kea Resort, where Mauna Kea Properties has provided public access from the highway by way of an easement through the resort to a dropoff/turnaround, where ten parking stalls are set aside for public use. A paved walkway from there leads to Kauna'oa Beach; in an area adjacent to the sandy beach, Mauna Kea Properties has constructed a public restroom and shower facility, and from that point, it is about a half-hour walk on the shoreline trail to Hapuna Beach. Public access is shown in Figures V-9 and V-10.

#### 6.1.2.5 Beach Usage

While no formal studies have been conducted over time, observation suggests there has been a change in both the users and uses at Hapuna since major improvements have been made there. Hapuna was a relatively isolated area before park amenities were installed and the Queen Ka'ahumanu Highway built. Long-time local residents were the primary users, and family picnicking and social functions the most frequent activities. Swimming, net fishing, and pole fishing were secondary uses. Camping was allowed on the beach. Water recreation activities now seem predominant, including bodysurfing, "boogy-boarding", swimming, and sunbathing. Fishing presently tends to be concentrated at the rocky points of the shoreline.

Since the 1960s, a gradual change of user groups has accompanied change in uses at Hapuna. Fewer family groups have been observed, and the active water recreation users tend to include greater proportions of newcomers to the island, visitors, military personnel, and younger people (including members of long-time local resident families, but usually congregating at the beach in peer groups rather than with extended families). There has also been a significant increase in crime at Hapuna, particularly theft from cars in the parking area. A police official contacted for this report indicated that illegal drug and alcohol possession is common; drug dealing is also suspected (personal communication, Lt. Leningrad Elarianoff, Waimea Police District Station, March 31, 1987).



#### 6.1.2.6 Beach Counts

Areas of concern include the intrusive presence of hotel guests who, some fear, will transform the public beach into a private enclave, and the potential for congestion as new population and hotel guests add their numbers to those who are current users. As a basis for projecting potential impacts due to South Kohala Resort development, observations of current beach usage can be supplemented by counts quantifying this use. To estimate future use of Hapuna Beach by resort guests, residents, employees and their families, a quantitative analysis of beach usage at Hapuna State Beach Park and at Kauna'oa Beach has been performed and is summarized as follows. Counts were taken at Kauna'oa Beach, which fronts the existing Westin Mauna Kea, to examine the pattern of resort guest usage, which is expected to be similar at the proposed South Kohala Resort hotel. It is assumed that like proportions of hotel guests at the South Kohala Resort will use Hapuna Beach as Westin Mauna Kea guests use Kauna'oa Beach.

##### 6.1.2.6.1 1985 Counts

During the period of County permitting and public hearings for the proposed South Kohala Resort in 1985, concerns were raised over the potential for change at Hapuna Beach as a result of the development, specifically increased use of the beach by a different type of beach-goer. In June and July of 1985, counts were taken at Hapuna Beach during a two-week period, including the July 4th holiday, which was anticipated to be a peak usage day.

Daily counts were taken from June 24 through July 7, 1985 at Hapuna Beach at 6 am, 9 am, noon, 3 p.m., and 6 p.m. to determine whether there would be fluctuations in use according to time of day and day of week. Counts were taken at the north end of the beach (roughly one-third of the sand area), the south end of the beach (roughly two-thirds of the sand area), and the picnic or grassy area.

Results show that the heaviest use was at noon and 3 p.m. Table V-35 summarizes daily peak attendance at Hapuna State Beach Park and shows average peak usage. The daily peak ranged from 183 recorded on a Monday to 1,150 on July 4th, with an average daily peak of 345. It should be noted that a rock concert held at the beach on the July 4th holiday might have contributed to the high beach attendance. The north end of the beach, being further from the parking area, was at all times more sparsely used than the south end of the sandy beach. During the peak time on July 4th, 122 persons were counted at the north end, as opposed to 623 at the south end.

Also for two weeks in July 1985, daily counts were taken at Kauna'oa Beach, fronting the Westin Mauna Kea. Again, heaviest use was observed at noon and 3 p.m. The average peak count was about 180, and contrary to Hapuna Beach, there was little weekday/weekend differentiation in usage. Although there are 10 public parking stalls at the Westin Mauna Kea and passengers can be dropped off at the beach area, the majority of Kauna'oa Beach users were observed to be hotel guests. During the count period, occupancy at the Westin Mauna Kea averaged almost 80 percent, with a daily average of 480 guests. Records show that almost half of the hotel guests signed up for the alternative recreational activities of golf or tennis, although some of these same guests most likely also used the beach during the day.

Table V-35: SUMMARY OF PEAK ATTENDANCE AT HAPUNA STATE BEACH PARK  
June 24, 1985 - July 7, 1985

| Date          | North End | % Total | South End | % Total | Subtotal | % Total | Picnic Area | % Total | TOTAL |
|---------------|-----------|---------|-----------|---------|----------|---------|-------------|---------|-------|
| Mon, Jun 24   | 23        | 12%     | 112       | 57%     | 135      | 68%     | 63          | 32%     | 198   |
| Tues, Jun 25  | 29        | 11%     | 158       | 62%     | 187      | 74%     | 67          | 26%     | 254   |
| Wed, Jun 26   | 15        | 8%      | 127       | 66%     | 142      | 74%     | 51          | 26%     | 193   |
| Thurs, Jun 27 | 21        | 11%     | 117       | 61%     | 138      | 72%     | 54          | 28%     | 192   |
| Fri, Jun 28   | 18        | 7%      | 187       | 72%     | 205      | 79%     | 55          | 21%     | 260   |
| Sat, Jun 29   | 18        | 6%      | 179       | 58%     | 197      | 64%     | 111         | 36%     | 308   |
| Sun, Jun 30   | 48        | 9%      | 277       | 52%     | 325      | 61%     | 206         | 39%     | 531   |
| Mon, Jul 1    | 40        | 22%     | 108       | 59%     | 148      | 81%     | 35          | 19%     | 183   |
| Tues, Jul 2   | 13        | 6%      | 145       | 67%     | 158      | 73%     | 59          | 27%     | 217   |
| Wed, Jul 3    | 23        | 11%     | 121       | 58%     | 144      | 70%     | 63          | 30%     | 207   |
| Thurs, Jul 4  | 122       | 11%     | 623       | 54%     | 745      | 65%     | 405         | 35%     | 1150  |
| Fri, Jul 5    | 36        | 17%     | 135       | 65%     | 171      | 82%     | 38          | 18%     | 209   |
| Sat, Jul 6    | 42        | 11%     | 212       | 58%     | 254      | 69%     | 113         | 31%     | 367   |
| Sun, Jul 7    | 68        | 12%     | 333       | 59%     | 401      | 71%     | 166         | 29%     | 567   |
| Average       | 37        | 11%     | 202       | 59%     | 239      | 69%     | 106         | 31%     | 345   |

#### 6.1.2.6.2 December 1986/January 1987 Counts

The results of the 1985 beach counts at Hapuna Beach were criticized by some opponents of South Kohala Resort development as being artificially low due to the recent United Airlines strike. They contended that the beach would probably have been more crowded without the strike. In response to this criticism, counts were again made at Hapuna Beach and Kauna'oa Beach as part of the preparation of this environmental impact statement. To estimate the current peak usage of the beaches, the winter holiday period was chosen. It was reasoned that the beaches would be most crowded during a period of high hotel occupancy and school vacation, thus determining the highest expected usage.

Counts were taken from December 22, 1986 through January 4, 1987 at Hapuna State Beach Park (6.45 am, 9 am, noon, 3 p.m., and 5.30 p.m.). Three areas were counted separately as they were in 1985: the north end of the beach, the south end of the beach, and the picnic area. Results are shown in Table V-36, which summarizes daily peak attendance.

As in 1985, the heaviest use at Hapuna Beach in 1986/87 was at noon and 3 p.m., with an average daily peak of 743 as opposed to 345 in 1985. The daily peak ranged from about 420 midweek to 1,100 on a Sunday. Weekend counts were higher than in July 1985, ranging from about 700 to 1,100. Again, the north end of the beach was more sparsely used than the south end. During peak times, there were never more than 18 percent of beach users at the north end. Average use was 11 percent at the north end, 61 percent at the south end, and 28 percent in the picnic area.

Beach usage at Kauna'oa Beach was also observed in 1986/87, and again heaviest use was at noon and 3 p.m. The peak daily average was about 430, with most persons using the sand beach area (about 80 percent) as opposed to the hotel pool and grassed areas. As in 1985, little weekday/weekend differentiation in numbers was observed. During the count period, the Westin Mauna Kea was almost always at full occupancy, and as in 1985, a substantial number participated in alternative recreational activities such as golf and tennis.

#### 6.1.2.6.3 August/September 1987 Counts

As a follow-up to the above two count periods, and to monitor a period of relatively "normal" usage, counts are being made at Hapuna Beach. The north and south ends of the beach are being counted (and not the picnic area) since the use of sandy beach seems to be the major area of concern. Beach counts are being made on Wednesday (weekly low) and on Saturday (weekly high). Counts started on August 15 and continued through the end of September 1987.

Table V-37 summarizes peak attendance in the north and south ends of the sand beach at Hapuna. As during previous counts, peak usage of the north end remains proportionately less than at the south end.

A comparison of Tables V-35, V-36, and V-37, shows that usage of the sand areas of Hapuna has increased from 1985 to 1987, and that beach usage during the winter holiday season is highest. Although in absolute numbers usage of the sand areas has not increased substantially, there seems to be a trend of increased proportional use of the north end of the beach.

Table V-36: SUMMARY OF PEAK ATTENDANCE AT HAPUNA STATE BEACH PARK  
December 22, 1986 - January 4, 1987

| Date          | North End | % Total | South End | % Total | Subtotal | % Total | Picnic Area | % Total | TOTAL |
|---------------|-----------|---------|-----------|---------|----------|---------|-------------|---------|-------|
| Mon, Dec 22   | 15        | 3%      | 375       | 69%     | 390      | 72%     | 154         | 28%     | 544   |
| Tues, Dec 23  | 49        | 9%      | 354       | 68%     | 403      | 77%     | 119         | 23%     | 522   |
| Wed, Dec 24   | 41        | 10%     | 282       | 67%     | 323      | 77%     | 98          | 23%     | 421   |
| Thurs, Dec 25 | 141       | 18%     | 517       | 67%     | 658      | 85%     | 119         | 15%     | 777   |
| Fri, Dec 26   | 92        | 11%     | 508       | 59%     | 600      | 70%     | 259         | 30%     | 859   |
| Sat, Dec 27   | 43        | 5%      | 333       | 40%     | 376      | 45%     | 457         | 55%     | 833   |
| Sun, Dec 28   | 101       | 9%      | 693       | 62%     | 794      | 71%     | 319         | 29%     | 1113  |
| Mon, Dec 29   | 73        | 13%     | 287       | 52%     | 360      | 66%     | 187         | 34%     | 547   |
| Tues, Dec 30  | 116       | 14%     | 530       | 62%     | 646      | 76%     | 206         | 24%     | 852   |
| Wed, Dec 31   | 91        | 14%     | 421       | 63%     | 512      | 77%     | 155         | 23%     | 667   |
| Thurs, Jan 1  | 103       | 12%     | 606       | 72%     | 709      | 84%     | 138         | 16%     | 847   |
| Fri, Jan 2    | 66        | 10%     | 341       | 50%     | 407      | 59%     | 279         | 41%     | 686   |
| Sat, Jan 3    | 63        | 9%      | 483       | 68%     | 546      | 77%     | 160         | 23%     | 706   |
| Sun, Jan 4    | 147       | 14%     | 623       | 61%     | 770      | 75%     | 256         | 25%     | 1026  |
| Average       | 82        | 11%     | 454       | 61%     | 535      | 72%     | 208         | 28%     | 743   |



Table V-37: SUMMARY OF PEAK ATTENDANCE AT HAPUNA STATE BEACH PARK  
August and September 1987

| Date        | North | End | % Total | South | End | % Total | Subtotal | % Total | Picnic Area | % Total | TOTAL |
|-------------|-------|-----|---------|-------|-----|---------|----------|---------|-------------|---------|-------|
| Sat, Aug 15 | 73    |     |         | 240   |     |         | 313      |         |             |         |       |
| Wed, Aug 19 | 42    |     |         | 280   |     |         | 322      |         |             |         |       |
| Sat, Aug 22 | 59    |     |         | 190   |     |         | 249      |         |             |         |       |
| Wed, Aug 26 | 36    |     |         | 103   |     |         | 139      |         |             |         |       |
| Sat, Aug 29 | 91    |     |         | 290   |     |         | 381      |         |             |         |       |
| Wed, Sep 2  | 17    |     |         | 73    |     |         | 90       |         |             |         |       |
| Sat, Sep 5* | 79    |     |         | 252   |     |         | 331      |         |             |         |       |
| Sun, Sep 6* | 113   |     |         | 333   |     |         | 446      |         |             |         |       |
| Mon, Sep 7* | 138   |     |         | 325   |     |         | 463      |         |             |         |       |
| Wed, Sep 9  | 34    |     |         | 107   |     |         | 141      |         |             |         |       |
| Sat, Sep 12 | 40    |     |         | 140   |     |         | 180      |         |             |         |       |
| Wed, Sep 16 | 39    |     |         | 87    |     |         | 126      |         |             |         |       |
| Sat, Sep 19 | 56    |     |         | 117   |     |         | 173      |         |             |         |       |
| Wed, Sep 23 | 31    |     |         | 81    |     |         | 112      |         |             |         |       |
| Sat, Sep 26 | 77    |     |         | 220   |     |         | 297      |         |             |         |       |
| Wed, Sep 30 | 35    |     |         | 136   |     |         | 171      |         |             |         |       |
| Average     | 60    |     |         | 186   |     |         | 246      |         |             |         |       |

\*Labor Day Weekend

## 6.2 PROBABLE IMPACTS AND MITIGATION MEASURES

### 6.2.1 Hapuna Beach

#### 6.2.1.1 General Issues

As stated above, potential impacts of the South Kohala Resort on use of Hapuna Beach may be grouped into two general categories:

**Intrusion:** the degree to which the resort's physical presence and any specific considerations for hotel guests would intrude upon public enjoyment and/or sense of equity (that is, the feeling that visitors have no more special rights at the beach than do residents).

**Congestion:** the degree to which development of this project would contribute to higher levels of beach use and a less satisfactory experience for Big Island residents who are using the beach now.

Although the intrusion issue could be interpreted as an attempt by current users (who, arguably, have already to some degree expropriated the beach from prior user groups) to deny new users access to the same resources, this interpretation misses the real sense of value attributed to the beach experience by these groups. Additionally, many Big Island residents have chosen to move to or remain on the island because they value its open spaces and rural lifestyle more than the economic opportunities available in more urban environments. Placement of jobs and large structures near an excellent beach is an apparent contradiction of such values.

The congestion issue is related as much or more to overall regional development as to the South Kohala Resort in particular. It can be argued that visitors and residents in the mauka portions of South Kohala Resort will have a disproportionately smaller impact on future Hapuna congestion (because they will be older and more likely to prefer non-beach-oriented recreational facilities available at the resort) than will visitors at other West Hawaii resorts and in-migrating workers (younger people whose social interaction patterns would be more beach-oriented). Whether or not this is true, increasing congestion at Hapuna seems a likely impact of cumulative resort development in West Hawaii.

With the operation of the proposed 350-room hotel at South Kohala Resort, a large proportion of the resort guests might be expected to use Hapuna Beach (predominantly at the north end), particularly during peak winter periods, if beach use is similar to use of Kauna'oa Beach by Westin Mauna Kea guests. This would be a substantial increase from current use of the north end where most of the guests are expected to be. New population resulting from direct and indirect employment of persons new to the island due to the South Kohala Resort development and other resort and non-resort development, will also increase Hapuna Beach use, mostly on weekends and holidays.

#### 6.2.1.2 Approach for Analysis

To assess the social impact of the proposed development on Hapuna Beach, Community Resources, Inc. followed a two-step approach. First, they sought to determine whether comparable situations have arisen elsewhere in the state

and what the outcomes were in these cases. Second, they considered mitigation/management strategies to minimize potential negative outcomes and maximize positive ones. The second step was regarded as more significant; it was considered less important to forecast whether residents and visitors will compete for beach resources (since this depends on a variety of factors) than to prevent a negative sense of competition from occurring. Therefore, even the search for comparable situations focused primarily on "lessons learned" for potential development adjacent to Hapuna.

#### 6.2.1.3 Comparable Hawaii Situations and Outcomes

Community Resources, Inc. contacted County parks and planning personnel on all islands to seek roughly comparable cases--instances in which a resort development was constructed by a popular beach. It was recognized that no other Hawaii situation was likely to be completely comparable. Also, Hawaiian beach use expert John R.K. Clark was subcontracted to provide additional perspective. (Mr. Clark is the author of Beaches of the Big Island, The Beaches of Oahu, and The Beaches of Maui County.)

Some partially comparable situations were identified on Kauai and Maui, although it should be noted that both islands have more sand beaches than the Big Island and, therefore, any given beach represents less of an unusual resource.

**Poipu Beach Park/The Waiohai.** Mr. Clark considers the construction of the new Waiohai Hotel in 1981 near Poipu Beach Park on Kauai as most comparable to the Hapuna scenario. In this case, a large and visible resort complex is located next to a public beach park frequented primarily by tourists and younger Kauai residents who picnic, swim, bodyboard, and bodysurf (user groups very similar to those at Hapuna). The fairly small white sand beaches fronting the park and hotel are separated by a low, rocky point. Comparison to Hapuna is somewhat limited by the fact that the beach in question is not the best in the area, and the new hotel replaced an older, smaller one on the same site. However, Mr. Clark reported that the Waiohai construction had "no appreciable impact on the established user groups at Poipu Beach Park or on the surrounding community." (Memo from John Clark, March 22, 1987.)

It was also determined by Community Resources, Inc. that the Waiohai has incorporated landscape and design features that preserve hotel security while minimizing any sense of intrusion or beach competition between residents and hotel guests. Low hedges between the hotel structures and the beach create a subtle barrier and yet do not block the view in either direction. The beach-side entrance to the hotel bridges the hedge and can be observed by hotel security. The Waiohai Resort's general manager feels that this arrangement retains the feeling of an open beach for hotel guests and local beach-goers alike, while making the job of hotel security personnel more manageable (personal communication, Mr. Glenn Perry, March 30, 1987).

**Lydgate State Park/Kauai Resort Hotel.** According to Mr. Clark, user groups at Lydgate are primarily residents who bring their children to picnic and swim in coastal pools. Visitors and residents more interested in types of activities enjoyed at Hapuna (sunbathing, body-boarding, etc.) tend to seek out other beaches. While Lydgate has been the scene of occasional confrontations between residents and visitors, as well as between residents and other

residents, Mr. Clark attributes this less to the presence of the nearby hotel than to problems associated with drinking.

**Makena Beach/Wailea Resort.** On Maui, County planner John Minn reported that pre-Wailea users at Makena were largely long-time local residents whose typical uses included family picnics, fishing, and swimming--similar to Hapuna prior to the development of amenities there (personal communication, January 30, 1987). Following resort construction, these users tended to be replaced by visitors or newcomers more interested in sunbathing, snorkeling, and beach socializing. However, few complaints were voiced by local residents, due to the availability of alternative beaches and the fact that some local residents still use the Wailea beach and value the new amenities provided there.

Using Wailea as an example, Mr. Minn noted several design features which can exacerbate or minimize problems. As planned for the South Kohala Resort, a landscaped buffer zone at Wailea creates private areas and prevents the buildings from appearing to "loom" nearby. Amenities available to the public are equivalent to those available to hotel guests. However, at the Wailea public beaches (as at Hapuna), parking areas out of sight of the beach users both encourage theft from cars and discourage local family use due to the long walk.

#### **6.2.1.4 Mitigations and Management Strategies**

Possible mitigation measures will include steps to: (a) minimize intrusion of South Kohala Resort on Hapuna Beach users, including any sense of inequities between hotel guests and the general public; (b) alleviate Hapuna congestion by increasing land or facilities at the Hapuna Beach State Recreation Area; and (c) alleviate Hapuna congestion by developing other sandy beach areas as public parks.

##### **6.2.1.4.1 Minimizing Intrusion or Inequities**

As conditions for approval of the existing SMA permit for the subject project, the Planning Commission required the developer to:

- a. Develop a landscape plan including generous planting of trees and shrubbery to minimize visual impacts of the hotel and other structures.
- b. Avoid restricting public use of the beach or giving any impression that it is private (e.g., chairs will not be left unattended on the beach nor signs posted to give a sense of private use).
- c. Prohibit hotel guests and resort residents from using beach and water equipment prohibited at Hapuna Beach Park.
- d. Refrain from providing food and beverage services or sponsoring organized social activities on the beach.
- e. Keep the beach clear of structures--prohibit concessions or rental stands, movable carts or devices for equipment, etc.

#### 6.2.1.4.2 Upgrading/Expanding Hapuna Beach State Recreation Area

The 1970 master park development plan for Hapuna has been only partially carried out, and the State Recreation Functional Plan calls for implementation of budgeted improvements at the park. Further development would be entirely or primarily government funded, although the additional tax base provided by South Kohala Resort would help provide financing. Ultimate expansion to Wailea Beach is envisioned in the plan; other elements yet to be implemented include: (a) major landscape improvements--more shade trees and an on-site nursery; (b) additional picnic areas with rest rooms; (c) new tent campsites with rest rooms; (d) playing fields mauka and to the south of current parking lot; (d) other playing fields and additional parking south of Hapuna, mauka of Kanekanaka Point, with a road connecting to the present parking area; (e) children's zoo and playground; and (f) foot trails, including a lookout trail around Kanekanaka Point.

At a meeting of the South Kohala Resort Advisory Committee, the following additional recommendations were made as to services and facilities required to upgrade Hapuna Beach State Recreation Area: (a) better security or supervision to reduce crime; (b) lifeguards; (c) raw sewage disposal tied into the new resort; (d) litter control; (e) more parking stalls, especially for the handicapped; (f) wading pools for children; and (g) more cabins and a campsite near these cabins.

\$600,000 has been included among capital improvement projects in the State's 1987-89 budget for planning, land acquisition, design, and construction of improvements at Hapuna. The appropriation is currently going through a normal review process and must receive the Governor's approval. No decision has been made to date. (Hawaii Tribune Herald, July 26, 1987, p. 1.)

According to Wayne Souza, staff planner at the State of Hawaii Department of Land and Natural Resources (DLNR), Parks Division, funds appropriated by the Legislature are now being used to conduct an appraisal of selected private beachfront lots at Wailea, a first step in possible acquisition of lands for park use. Approximately 20 private lots are located on the bay. (Personal communication, February 9, 1987, and August 4, 1987.)

Recent devastating fires in the Waialea-Puako area, supposedly started by campers, have galvanized support on the Big Island for improvements and expansion at Hapuna, including the development of Wailea to minimize problems with illegal camping on undeveloped State land.

#### 6.2.1.4.3 New Public Beach Parks

Government action to develop more West Hawaii beach parks would be another way to alleviate future congestion at Hapuna. Proposed resort development at other beaches which are now relatively inaccessible, such as Makalawena, could also provide public shoreline access and facilities comparable to those at Anaeho'omalu. However, the focus here is on possible parks not effectively shared with hotels or other non-public facilities.

Mr. Souza reports that DLNR is performing a statewide resource inventory to identify possible beach park sites with good potential for swimming, body-surfing, etc. The focus is on coastal areas already surrounded by substantial

amounts of State-owned lands. Expected to be completed shortly, this inventory will provide information needed to select future sites for park development. Included in the inventory are several beaches in the region: Kiholo Bay, Maniniowali Beach at Kua Bay, Keawaiki Bay, and Mahai'ula Bay. Mr. Souza noted that funds have been appropriated for a study of Kiholo Bay, which is scheduled to begin next year.

#### **6.2.1.4.4 Community Priorities and Concerns Relating to Mitigations**

Community Resources, Inc. met with the South Kohala Resort Advisory Committee to form an idea of residents' priorities regarding the proposed development. Organized by MKP, the committee consists of 23 residents (about half of whom attended the meeting on February 3, 1987), including leaders of most of the major North and South Kohala community organizations.

**Minimizing Potential Intrusion.** The committee gave the highest priority to (a) avoiding any impression that northern Hapuna Beach is private or that public access is restricted, and (b) developer contributions to shoreline access. However, regarding the latter, the committee believed that such contribution should be off-site from the resort. There was no consensus whether the access should be provided at Hapuna, Wailea, or elsewhere. Committee members felt that it would be less "meaningful" to provide access on the South Kohala Resort site because this would be redundant with the adjacent state recreation area.

**Alleviating Future Beach Congestion.** The committee agreed that all or most government resources for park expansion should be devoted to developing new beach parks, as opposed to simply improving or expanding Hapuna or other existing facilities. It was felt that West Hawaii residents enjoy a variety of different coastal activities, and, therefore, new parks should offer a variety of recreational experiences--for example, improvements to sites suitable for fishing and semi-wilderness family campsites--not just Hapuna-style sandy beach parks. No clear consensus was achieved on recommending new beach park sites, although the most frequently named location was Wailea Bay, followed by Kiholo and Kawaihae.

Regarding future plans to upgrade Hapuna, committee members were less concerned with master planned physical improvements than with other services and facilities now lacking at the park. Specifically, the committee gave highest priority to the provision of (a) better security and supervision, (b) lifeguards, and (c) raw sewage disposal tied into the resort. It believed that funding for the first two items should come from government, although the benefits to the park of security and lifeguards at the resort were recognized.

#### **6.2.2 Other Impacts and Mitigation Measures**

Lapakahi State Historic Park and Pu'ukohola Heiau Historic Site are likely to experience increased use by visitors and residents as the result of new resort development, including the proposed South Kohala Resort. This increase in interest and number of visitors, however, is considered beneficial.

The County Department of Parks and Recreation does not foresee any insurmountable conflicts between the proposed project and the use of public recreation facilities and services in the region. Because resorts provide on-site amenities for guests and residents, they have had little, if any, impact on off-site public facilities. (County of Hawaii, Dept. of Parks and Recreation, January 2, 1987.)

As is the case at Mauna Kea, Mauna Lani, and Waikoloa resorts, the South Kohala Resort golf course will be open to the public. An analysis of the demand for a new golf course in the region suggested that the existing courses are currently unable to absorb the demand, so the opening of the South Kohala Resort golf course will have a positive effect (see Chapter II, Section 3.3.7).

## **7.0 VISUAL IMPACTS**

### **7.1 VISUAL CHARACTER OF THE PROJECT SITE**

The proposed South Kohala Resort will be situated on moderately sloping land now covered with kiawe and lowland shrubs. Currently, the site has a distinctly expansive, open environment. Views are extensive rather than confined, and the ocean is a large part of the setting. Existing vegetation is sparse and dry.

### **7.2 VISUAL IMPACT OF THE DEVELOPMENT AND PROPOSED MITIGATION MEASURES**

#### **7.2.1 General Change in Character**

Construction of a 350-room hotel, 560 residential units, and associated amenities will change the visual character of the site. However, the overall low density of the development and the presence of a golf course will allow the resort to retain an open feeling--much like that at the neighboring Mauna Kea Resort. Moreover, the visual character of the site will be improved by the golf course and landscaping, which will replace expanses of arid scrubland.

#### **7.2.2 Expected Views of the Resort from the Highway**

Land use plans, regulations, and policies emphasize the maintenance of views from public places such as coastal highways. The golf course and other open space at South Kohala Resort will provide buffer zones between Queen Ka'ahumanu Highway and the development. The ten units of the very low-density High Bluffs single-family project will be the closest structures to the highway, but planned use of heavy vegetation will screen these units from the road, reducing the visual impact of the residences.

The limited height of the hotel, its distance from the highway, and the overall low-rise, low-density character of the project will assure that views of the ocean from the highway are not obstructed. Grading required for roadways and building pads will result in a changed appearance of the project site. However, buildings will be designed to be in harmony with the surrounding environment, creating a general effect similar to the Mauna Kea Resort.

### 7.2.3 Expected Views of the Resort from the Shoreline and Hapuna Beach

The maintenance of views from shoreline areas is also emphasized in land use plans, regulations, and policies. Views mauka from the public shoreline will be affected by the planned development (see Figures V-11, V-12, and V-13). Due to the low-rise nature of the project, as well as the vegetation that will surround the hotel and beach club, these impacts will not be as severe as they might be. Furthermore, resort facilities will be located well set back from the beach fronting the South Kohala Resort property. The unique topographic characteristics of the project site lend themselves to a layout that allows maintenance of scenic and open spaces.

The hotel will be perceived as a building cluster rather than a single, potentially more visually obstructive structure. Due to the slope of the property, the hotel will have the appearance of a low-rise facility from the state park. Moreover, abundant landscaping throughout the site, focusing on a garden setting theme, will soften the outlines of the hotel structure and provide a pleasing environment for the facility.

In addition to open space along the state park boundary, open space will be provided along the shoreline boundary as well. Only improvements described as part of the shoreline setback variance application will be constructed within 40 feet of the shoreline, and no structures will be located within 100 feet of the shoreline. Protected by County ordinance, these areas will be landscaped and used in accordance with the Open zone provisions, thereby ensuring an ample visual corridor along the shoreline and a gradual visual transition from the beach to the interior portions of the property.

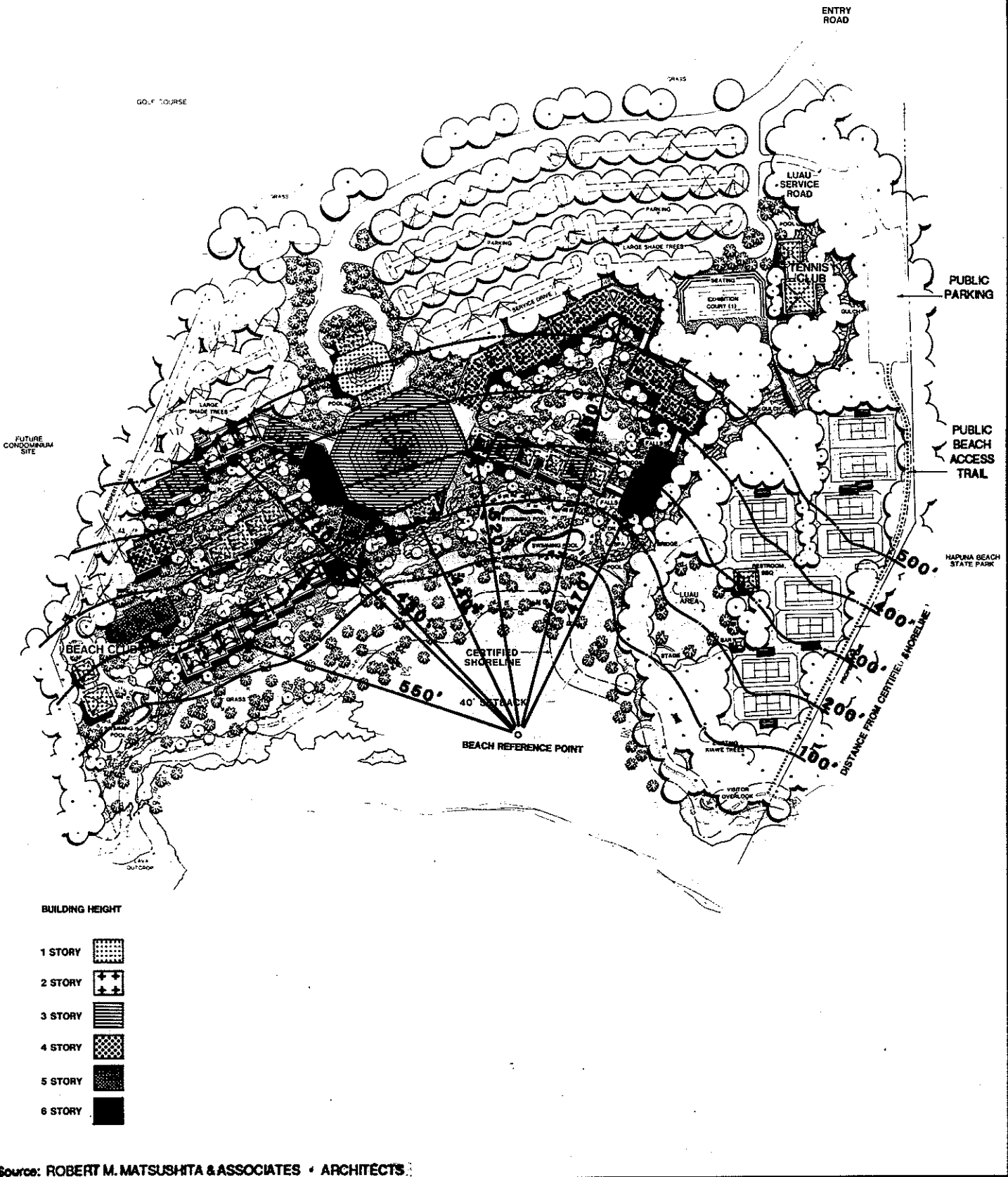
Views from the Hapuna Beach State Recreation Area looking northward will also be altered by construction of the resort. However, the views will be softened by the gradual progression of development northward. Areas closest to the park will be landscaped, the tennis complex will be separated from the hotel grounds by a natural drainage gulch, and the beach club will be located furthest north. Someone sitting on the beach fronting the State park will be able to see the beach club and part of the hotel (depending on the viewer's exact location), but much of the resort will be blocked from view by trees and other vegetation (including existing kiawe) between the park and resort properties. The tennis courts, situated adjacent to the property line, represent a recreational use compatible with the park and provide a buffer to the hotel itself.

To visualize the impact of the buildings, landscaping, and other improvements on the views from the shoreline, photographs were taken of the project site from various perspectives on Hapuna Beach. Renderings of the improvements were then superimposed on the photos. Shown on Figure V-14 are the points on the beach from where the photographs were taken:

- A At the north end of Hapuna Beach, in front of the hotel site.
- B At about the middle of Hapuna Beach, south of Ihumoku Point.
- C At the south end of Hapuna Beach.

Figures V-15, V-16, and V-17 illustrate the expected views of the resort facilities and amenities from points A, B, and C, respectively.





**BUILDING HEIGHT**

- 1 STORY [Pattern]
- 2 STORY [Pattern]
- 3 STORY [Pattern]
- 4 STORY [Pattern]
- 5 STORY [Pattern]
- 6 STORY [Pattern]

Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS

100 50 0 100 200 300 400

SCALE IN FEET

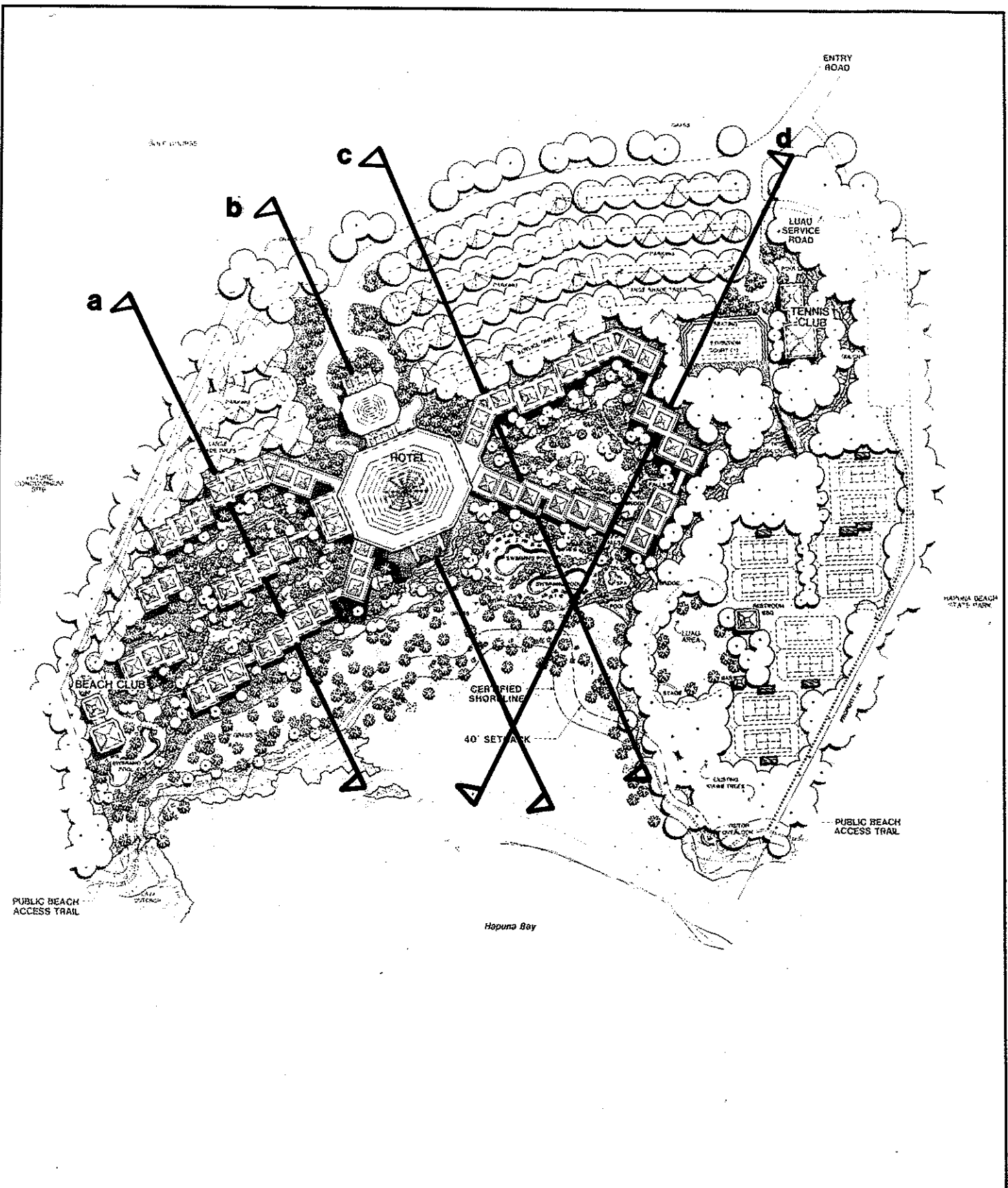
Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii September 1987



NORTH

**Figure V-11  
 HOTEL-BEACH DISTANCE DIAGRAM**

SOUTH KOHALA RESORT  
 Kohala Coast Resort Region • South Kohala, Hawaii



Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS.

100 50 0 100 200 300 400

SCALE IN FEET

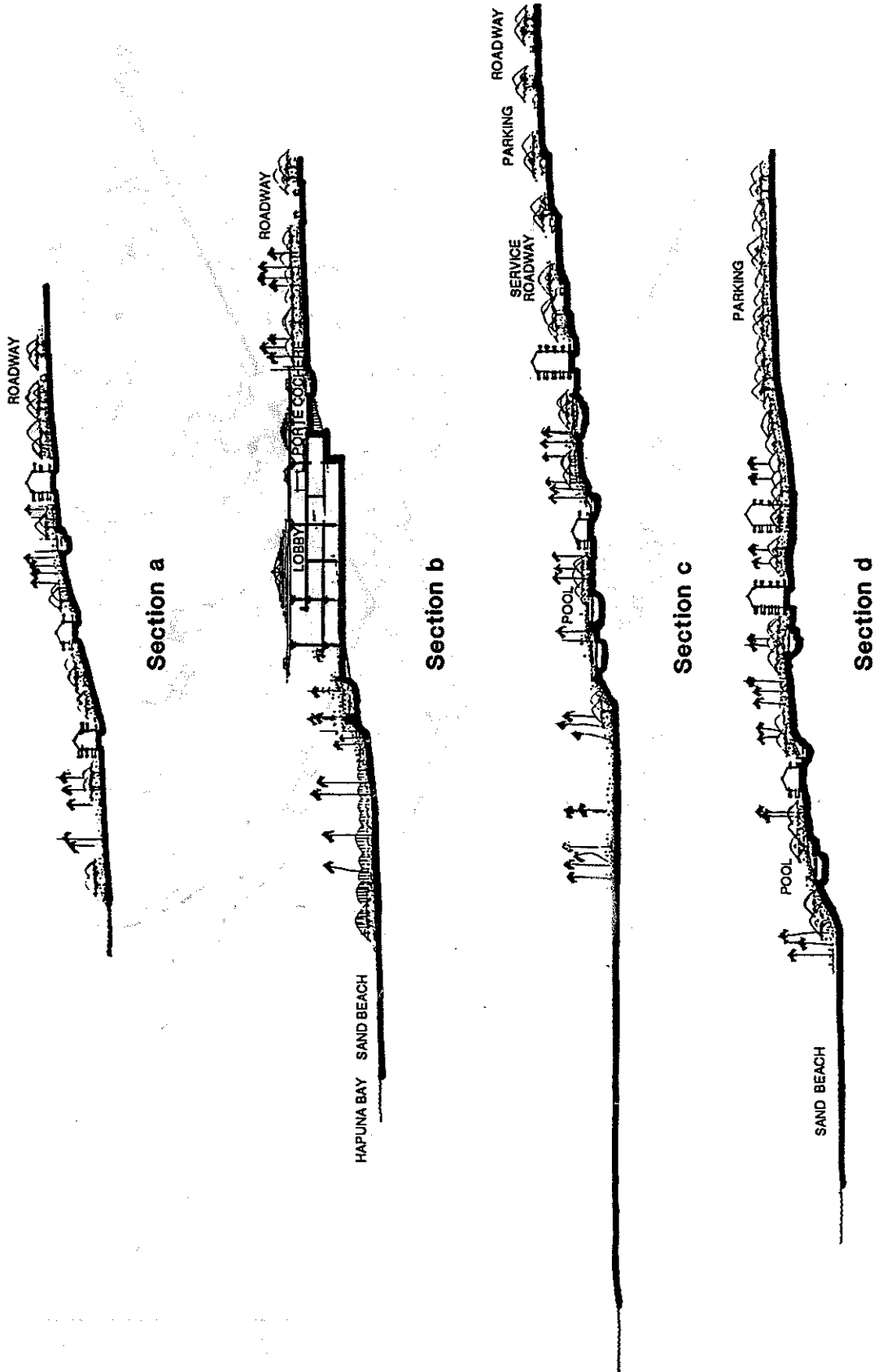
Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987



NORTH

**Figure V-12**  
**SITE PLAN WITH PROFILE LINES**

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii



**Figure V-13  
PROFILES THROUGH SITE**

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii

Source: ROBERT M. MATSUSHITA & ASSOCIATES • ARCHITECTS



SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii  
September 1987



Figure V-14  
POINTS ON HAPUNA BEACH FROM WHERE  
PHOTOGRAPHS WERE TAKEN TO  
ILLUSTRATE VISUAL IMPACTS

SOUTH KOHALA RESORT

Kohala Coast Resort Region • South Kohala, Hawaii

200 100 0 200 400

SCALE IN FEET



NORTH

Prepared By: BELT COLLINS & ASSOCIATES

Honolulu, Hawaii

December 1987

7.2.4 Expected Views from the Mauna Kea Resort

Views of the coast looking south from Mauna Kea Properties' planned Estates and Bluffs residential developments will be affected by construction of the South Kohala Resort beach and tennis clubs and the hotel. However, the existing golf course and other open space between the two resorts will provide a buffer zone.

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## **CHAPTER VI**

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## CHAPTER VI

### RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

#### 1.0 STATE LAND USE LAW

All lands in the State have been placed in one of four land use districts (Urban, Agriculture, Conservation, or Rural) by the State Land Use Commission (SLUC). State Land Use District Boundary Reviews are undertaken by the SLUC to update its Land Use District Maps. Besides this SLUC-initiated review, provisions for applicant-initiated amendments to the district boundaries have been established in Section 205-4 of the Hawaii Revised Statutes (HRS), and further promulgated in the State Land Use Commission: Rules of Practice and Procedure and District Regulations (12-21-75 as amended).



The South Kohala Resort lands makai of Queen Kaahumanu Highway are in the State Urban district. Mauna Kea Properties has successfully petitioned the State Land Use Commission to reclassify the mauka South Kohala Resort lands from Agriculture to Urban. The Commission granted incremental districting in two phases (see Figure VI-1).

On May 6, 1985, the State Land Use Commission reclassified approximately 317 acres of land from the Agricultural District to the Urban District as part of Increment I ("Phase I" in the Decision and Order). These lands will contain 16 holes of the golf course and approximately 150 units of single-family housing and/or condominium units. The second increment ("Phase II") of the development was approved for incremental redistricting and consisted of approximately 82 acres. Redistricting of Increment II from the Agricultural to the Urban District was to be granted upon a showing of substantial progress and completion of Increment I and development of the Applicant's resort hotel adjacent to Hapuna Beach. In addition to incremental districting, the only condition to the approval is that the applicant provide housing opportunities for low and moderate income Hawaii County residents and employees equivalent to 10 percent of the number of residential units to be developed in Increments I and II on the property. Alternatively, development of such housing may be outside of the property.

The original project development schedule called for substantial completion of Increment I and the hotel by 1990. This schedule was predicated upon obtaining the necessary County permits by 1987. Although diligently pursued, these County permits have not yet been obtained. Mauna Kea Properties, Inc. submitted applications for Special Management Area (SMA) use permits, rezoning, Shoreline Setback Variance (SSV), and Planned Unit Development (PUD) to the County of Hawaii in June 1985. The application for SSV was later withdrawn. After a lengthy contested case proceeding, Mauna Kea Properties received its SMA permits in January 1986. However, the granting of both permits was appealed to the Third Circuit Court and a separate lawsuit was initiated concerning the issuance of a negative declaration on the project. Although the court upheld the permit and the negative declaration, appeals



**LEGEND**

-  First increment of urban district reclassification
-  Remainder area of urban district reclassification

400 200 0 400 800 1200

SCALE IN FEET

Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii

September 1987



NORTH

**Figure VI-1**  
**INCREMENTAL URBAN DISTRICT**  
**RECLASSIFICATION**  
**SOUTH KOHALA RESORT**

Kohala Coast Resort Region • South Kohala, Hawaii



were taken to the Hawaii Supreme Court in 1986. Rather than engage in further litigation, Mauna Kea Properties submitted a revised application for shoreline setback variance in November 1986, and a determination was made that the preparation of an environmental impact statement was required.

## **2.0 CONSERVATION DISTRICT RULES**

The administrative rules of the State of Hawaii Department of Land and Natural Resources (June 1981), Title 13, Chapter 2 (formerly Regulation No. 4), govern land use within the conservation district.

None of the property to be developed for the South Kohala Resort is in the conservation district.

## **3.0 HAWAII STATE PLAN**

The Hawaii State Plan (State of Hawaii, Department of Planning and Economic Development, 1978) consists of a series of broad goals, objectives and policies which are to act as the guidelines for the growth and development of the State. In general, the proposed action is consistent with the overall intent of the State Plan. Discussed below are the specific goals, objectives, policies, and priority actions contained in Part I and Part III of the State Plan which are thought to be most directly related to the proposed project.

### **3.1 PART I: OVERALL THEMES, GOALS, OBJECTIVES, AND POLICIES**

#### **Section 226-4 State Goals**

- (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations.
- (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.

The proposed project is consistent with the goals of the State Plan. Resort development in the South Kohala district will provide new employment opportunities and enhance economic development. The construction and operation of a new hotel will bring job opportunities to nearby residential communities and will contribute to the growth of much needed commercial development. Urban development on unusable land does not encroach upon other types of land uses and affords the opportunity to create a physical environment which will greatly enhance the area's ecosystem. Innovative landscaping and design will provide new habitats for native flora and fauna which would otherwise be unable to survive in the arid climate. The end result will be the development of a well-designed, aesthetically pleasing environment providing recreational opportunities to visitors and area residents alike.

**Section 226-5      Population**

- (a) **OBJECTIVE:** It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.
- (b) To achieve the population objective, it shall be the policy of this State to:
  - (2) Encourage an increase in economic activities and employment opportunities on the Neighbor Islands consistent with community needs and desires.
  - (3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.
  - (7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.

At a time when employment opportunities are decreasing in the agricultural sector of Hawaii's economy, opportunities are increasing in the visitor industry. Resultant primary and secondary employment at the South Kohala Resort will provide new opportunities for socio-economic growth and development. The coordinated planning and development of the proposed resort and its accompanying infrastructure will result in the optimal use of land and water resources.

**Section 226-6      Economy - General**

- (a) Planning for the State's economy in general shall be directed toward achievement of the following objectives:
  - (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.
- (b) To achieve the general economic objectives, it shall be the policy of the State to:
  - (6) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.
  - (8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.
  - (10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.
  - (13) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy.

- (14) Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.

Development of the South Kohala Resort will provide new employment opportunities in the West Hawaii area. Construction of facilities is expected to occur over a period of nine years, thereby contributing to sustaining a healthy level of construction activity on the island of Hawaii. Both hotel/resort and construction employment have favorable financial multiplier effects. Due to the decline of the sugar industry in North Kohala and other Big Island communities, local unemployment rates have been higher than state-wide rates. Direct and indirect employment related to the South Kohala Resort will contribute to alleviating this problem.

#### **Section 226-7 Economy - Agriculture**

- (a) OBJECTIVE: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:
  - (1) Continued viability in Hawaii's sugar and pineapple industries.
  - (2) Continued growth and development of diversified agriculture throughout the State.
- (b) To achieve the agricultural objectives, it shall be the policy of this State to:
  - (8) Expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.
  - (11) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.

Local agricultural products are featured at existing West Hawaii resort service establishments where, very often, visitors are first introduced to some of these products. The South Kohala Resort will provide a new, expanded market for local fruits, vegetables, fish, meat and beverages. At the same time, development of the project will not decrease the inventory of agriculturally suitable lands. The entire project site is unsuited to agricultural use, particularly if left unirrigated.

The new resort will also provide employment to agricultural workers displaced due to the decline of the sugar industry in North Kohala and other areas of the Big Island.

#### **Section 226-8 Economy - Visitor Industry**

- (a) OBJECTIVE: Planning for the State's economy with respect to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.

- (b) To achieve the visitor industry objective, it shall be the policy of this State to:
- (1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.
  - (2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.
  - (3) Improve the quality of existing visitor destination areas.
  - (4) Encourage cooperation between the public and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.
  - (5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.
  - (6) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the visitor industry.
  - (7) Foster a recognition of the contribution of the visitor industry to Hawaii's economy and the need to perpetuate the aloha spirit.
  - (8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaii's cultures and values.

South Kohala Resort intends to maintain the high standards of operation established by other West Hawaii luxury resorts. The resort will be characterized by low-density development and the careful blending of structures and amenities into the natural surroundings.

Due to the luxury character of the planned hotel and its extensive landscaping, the ratio of employees to hotel guests will exceed the average for visitor facilities in Hawaii. Training programs for employees and further local opportunities for employment will be provided.

The goods and services required by the resort will generate a positive economic benefit for businesses in the region, islandwide, and statewide. Businesses stimulated by the new development will, in turn, contribute to further economic growth and new opportunities for employment.

A special effort is being made to assure sensitivity to neighboring communities and activities in the development process. The value of Hapuna Beach State Recreation Area to residents and visitors is recognized, as well as the need to maintain access to the shoreline. An advisory committee composed of residents (including leaders of most of the major North and South Kohala community organizations) has been organized by the developer to provide suggestions and voice community concerns and priorities.

Finally, the success of the project will depend in part upon the ability to preserve the scenic beauty of the area. To that end, preservation and enhancement of the natural resources on and around the project site will be a matter of great importance and concern during the construction and operation of the facilities.

**Section 226-11 Physical Environment - Land-Based, Shoreline, and Marine Resources**

- (a) OBJECTIVE: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:
- (1) Prudent use of Hawaii's land-based, shoreline, and marine resources.
  - (2) Effective protection of Hawaii's unique and fragile environmental resources.
- (b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
- (1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.
  - (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
  - (3) Take into account the physical attributes of areas when planning and designing activities and facilities.
  - (4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.
  - (6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.
  - (8) Pursue compatible relationships among activities, facilities, and natural resources.
  - (9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.

The site of the proposed resort is located at the north end of Hapuna Bay, a pristine body of water fronted by a natural white sand beach. The facilities, surrounding landscaping, and recreational amenities will all be designed to enhance and protect the existing environment. Preservation and interpretation of significant archaeological sites and incorporation of native flora into the resort landscaping represent an attempt to integrate compatible natural resources into the overall design of the facilities. Measures will be taken to minimize the impact of drainage from the resort on the offshore environment. Management practices will assure that shoreline

waters are not adversely affected by fertilizers and pesticides used on the golf course and landscaping. With development of the project, current public access to Hapuna Bay will remain unimpeded and, in fact, will be enhanced.

**Section 226-12      Physical Environment - Scenic, Natural Beauty, and Historic Resources**

- (a) **OBJECTIVE:** Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.
- (b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:
  - (1) Promote the preservation and restoration of significant natural and historic resources.
  - (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.
  - (4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.
  - (5) Encourage the design of developments and activities that complement the natural beauty of the islands.

The two significant historic sites identified on the South Kohala Resort property, Kauna'oa Point Complex and a portion of Trail 9, have been recorded and will be preserved. Furthermore, the applicant is committed to the preservation and enhancement of the natural features associated with the project site including, but not limited to, the shoreline and mountain vistas, as well as the pristine character of Hapuna Bay.

**Section 226-13      Physical Environment - Land, Air, and Water Quality**

- (a) **OBJECTIVE:** Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:
  - (1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.
  - (2) Greater public awareness and appreciation of Hawaii's environmental resources.
- (b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:
  - (2) Promote the proper management of Hawaii's land and water resources.

- (3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.
- (6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.
- (7) Encourage urban developments in close proximity to existing services and facilities.
- (8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures and visitors.

The design, construction and management of the South Kohala Resort will be in keeping with the standards established for other West Hawaii luxury resorts. The project does not involve any direct physical modifications to the nearshore environment. Studies conducted to assess the potential impact of the development on air and water quality have concluded that changes will be minimal and temporary in most cases. Landscaping and other features will be designed to intercept and minimize on-site drainage into Hapuna Bay. Construction plans will focus on reducing impacts on coastal water quality wherever practicable. Avoidance of adverse impacts of agricultural chemicals on water quality will be assured by implementation of management practices similar to those at the Mauna Kea Resort, where contamination of shoreline waters has not occurred. The planned resort is in close proximity to existing services and support facilities and will enhance the existing urban development in the area.

#### **Section 226-15 Facility Systems - Solid and Liquid Wastes**

- (a) **OBJECTIVE:** Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:
  - (1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.
  - (2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.
- (b) To achieve solid and liquid waste objectives, it shall be the policy of this State to:
  - (1) Encourage the adequate development of sewerage facilities that complement planned growth.

The proposed resort will be served by its own sewage collection system, designed to County standards, and sewage treatment plant, designed to meet State and Federal water quality and health standards. Sewage will be treated to the secondary level at the wastewater treatment plant, which will have a total capacity of 0.4 mgd. This will fully accommodate the completely developed resort since it is based on the maximum number of units to be built and 100 percent occupancy.

**Section 226-16 Facility Systems - Water**

- (a) **OBJECTIVE:** Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.
- (b) To achieve the facility systems water objective, it shall be the policy of this State to:
  - (1) Coordinate development of land use activities with existing and potential water supply.
  - (6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.

The South Kohala Resort will utilize the Lalamilo water resources developed by the Mauna Kea Properties in conjunction with Mauna Lani Resort, the State of Hawaii, and the County of Hawaii. The proposed development currently has access to adequate potable water supplies to meet demand in the short term for the first phase--the hotel, golf course and clubhouse, tennis and beach clubs, and ten single-family residential units. Mauna Kea Properties has a total allotment of 1.0 mgd; current projected usage is 0.55 mgd, so a balance of 0.45 mgd is available for additional development. Since this allotment will be insufficient for the needs of the entire South Kohala Resort beyond 1993, Mauna Kea Properties is prepared to seek new sources of potable water. As needed, it will fulfill its water requirements by drilling more wells on its lands at the 1,200-foot elevation or by participating in future expansion of the Lalamilo water system or other available source.

To conserve water, it is proposed that treated sewage effluent and brackish water be used to irrigate the South Kohala Resort golf course. In addition, landscaping, irrigation practices, and facility design will all be adapted to the arid environment to minimize water use whenever practical. The resort's water conservation program will also include promotion of a water conservation ethic among guests and residents.

**Section 226-18 Facility Systems - Energy/Telecommunications**

- (c) To further the energy objectives, it shall be the policy of this State to:
  - (3) Promote prudent use of power and fuel supplies through conservation measures including education and energy-efficient practices and technologies.

The design, construction, and operation of the South Kohala Resort will utilize the most appropriate energy technologies and conservation methods.



**Section 226-19      Socio-Cultural Advancement - Housing**

- (a) **OBJECTIVE:** Planning for the State's socio-cultural advancement with regard to housing shall be directed towards achievement of the following objectives:
- (1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, livable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals.
  - (2) The orderly development of residential areas sensitive to community needs and other land uses.
- (b) To achieve the housing objectives, it shall be the policy of this State to:
- (1) Effectively accommodate the housing needs of Hawaii's people.
  - (2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.
  - (3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.
  - (5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.
  - (6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.
  - (7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the cultures and values of the community.

Recognizing that the development of the South Kohala Resort will further stimulate economic and population growth in the region, Mauna Kea Properties is engaged in discussions with County authorities focused on identifying appropriate alternatives for the provision of employee housing to serve the needs of the employees of the South Kohala Resort. Development of employee housing within existing urban areas that is consistent with the culture and values expressed in the surrounding community will contribute to the lessening of demand for housing in the community. The expansion of Kawaihae Village may be among the specific methods of providing employee housing to meet future demand. Consideration may also be given to participation in the Kealahela project.

**Section 226-23      Socio-Cultural Advancement - Leisure**

- (a) **OBJECTIVE:** Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.
- (b) To achieve the leisure objective, it shall be the policy of this State to:
  - (4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historic, geological, or biological values while ensuring that their inherent values are preserved.
  - (5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.
  - (10) Assure adequate access to significant natural and cultural resources in public ownership.

Planning for South Kohala Resort is being carried out with an appreciation for the recreational value of Hapuna Beach and the need to assure that use of this public beach is not adversely affected by the proposed project. The developer has already agreed to take specific steps to avoid restricting public use of the beach or giving any impression that it is private.

The identification and preservation of appropriate historic and natural resources on-site will further the public's understanding of their historic, cultural and scientific significance. Public access to these resources will be maintained, and preservation of a culturally significant coastal trail will provide additional access and educational as well as recreational opportunities.

**Section 226-25      Socio-Cultural Advancement - Culture**

- (a) **OBJECTIVE:** Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.
- (b) To achieve the cultural objective, it shall be the policy of this State to:
  - (1) Foster increased knowledge and understanding of Hawaii's ethnic and cultural heritages and the history of Hawaii.

Archaeological reconnaissance, intensive survey, and testing were carried out in the makai portion of the project area, where the significant archaeological sites are situated. Based on this study, as well as previous surveys, a number of recommendations have been made regarding the treatment of significant sites. These results have been discussed with both State and County specialists and revised where appropriate. The developer intends to

follow the recommendations made to minimize potential impacts of development on significant archaeological features.

### **3.2 RELATIONSHIP OF PROPOSED ACTION TO THE STATE PLAN PRIORITY GUIDELINES**

The Priority Guidelines of the Hawai'i State Plan are established to provide overall guidelines to address areas of statewide concern. The proposed action is generally consistent with the general intent of the guidelines. Discussed below are the specific Priority Guidelines what are thought to be most directly related to the proposed project.

#### **Section 226-103 Economic**

- (a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:
  - (8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:
    - (A) An industry that can take advantage of Hawaii's unique location and available physical and human resources.
    - (B) A clean industry that would have minimal adverse effects on Hawaii's environment.
    - (C) An industry that is willing to hire and train Hawaii's people to meet the industry's labor needs.
    - (D) An industry that would provide reasonable income and steady employment.

Development of South Kohala Resort will contribute to construction employment over a period of at least eight years, permanent full-time and part-time operational jobs, and will stimulate the growth of employment in sectors of Hawaii's economy other than the visitor industry. As part of a major visitor destination area, the new resort will make a significant contribution to the economy of Hawaii County while having a relatively negligible physical impact on the environment.

- (b) Priority guidelines to promote the economic health and quality of the visitor industry:
  - (1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaii's residents and visitors.
  - (2) Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provides for adequate shoreline setbacks and beach access.

- (4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawaii's significant natural, scenic, historic, and cultural resources.
- (5) Develop and maintain career opportunities in the visitor industry for Hawaii's people, with emphasis on managerial positions.

Following the high standards established by the Mauna Kea Resort, the South Kohala Resort will promote visitor satisfaction by offering luxury-class facilities and services that are carefully and sensitively integrated into the natural beauty of the area. The low-density character of the facility, with its lush tropical landscaping, will conform to relevant State and County zoning and other regulations. The quality of the hotel development will be further enhanced by its commitment to providing long-term employment and advancement opportunities to its employees.

As discussed previously, the developer is sensitive to neighboring communities and activities, particularly any impact the resort may have on the adjacent Hapuna Beach State Recreation Area. Adequate shoreline setbacks and beach access will be provided. Furthermore, steps will be taken to maintain scenic vistas and preserve significant archaeological resources.

(e) Priority guidelines for water use and development:

- (1) Maintain and improve water conservation programs to reduce the overall water consumption.

(f) Priority guidelines for energy use and development:

- (2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.

The South Kohala Resort will implement appropriate conservation programs with regard to water and energy use in a manner consistent with governmental guidelines. Specific measures are outlined in Chapter V, Sections 5.5.2.2.2 and 5.8.2.

#### **Section 226-104 Population Growth and Land Resources**

(a) Priority guidelines to effect desired statewide growth and distribution:

(b) Priority guidelines for regional growth distribution and land resource utilization:

- (1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.

- (12) Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.
- (13) Protect and enhance Hawaii's shoreline, open spaces, and scenic resources.

The development of South Kohala Resort will focus new growth in an existing urban area with no significant potential for alternative uses. This implements the policy of maximizing the use of limited land resources. Furthermore, the use of existing infrastructure for water and the construction of a private sewage collection and treatment system will reduce the need for public expenditures to provide similar services. South Kohala Resort is prepared to develop additional sources of water as the need arises. Developers in the region have cooperated with government and shared in the cost of providing public facilities and services, and the developer of the South Kohala Resort will continue to do so. Finally, the design and construction of the resort will protect and enhance the shoreline, open spaces, and scenic resources of the area.

#### **Section 226-106      Affordable Housing**

- (6) Encourage public and private sector cooperation in the development of rental housing alternatives.
- (7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.

The provision of affordable housing, especially for employees of South Kohala Resort, is a concern that can be adequately addressed through a close working relationship between the resort's owners and the appropriate agencies of the County and State. Working together, the specific needs can be readily identified and appropriate responses and development plans can be formulated which will provide new housing opportunities in the region.

#### **4.0      STATE FUNCTIONAL PLANS**

State functional plans are intended to provide more detail to the Hawaii State Plan in twelve specific areas of concern -- agriculture, conservation lands, education, higher education, energy, health, historic preservation, housing, recreation, tourism, transportation, and water resources development. As defined in the Hawaii State Plan (section 2-10), a functional plan sets forth "the policies, programs and projects designed to implement the objectives of a specific field of activity when such activity or program is proposed, administered, or funded by an agency of the State." The twelve State functional plans were examined to determine the relationship of the proposed South Kohala Resort project to each.

#### 4.1 STATE AGRICULTURE FUNCTIONAL PLAN

Located in one of Hawaii's driest areas, the 489-acre project site has a sparse vegetation cover of grass and kiawe growing in rocky soil unsuitable for cultivation. The entire parcel is designated as Urban (incremental districting of the mauka lands) by the State Land Use Commission. It is not designated as important agricultural land on the ALISH (Agricultural Lands of Importance to the State of Hawaii) map of the area. Subsequently, the implementing actions of the State Agriculture Functional Plan do not pertain either directly or indirectly to the proposed project.

#### 4.2 STATE CONSERVATION LANDS FUNCTIONAL PLAN

None of the property to be developed for the South Kohala Resort is in the conservation district. No improvements makai of the certified shoreline are planned. None of the significant archaeological sites are recommended for acquisition nor are any situated on public land.

However, two implementing actions in the State Conservation Lands Functional Plan (Hawaii, State of, Department of Land and Natural Resources, June 1984) may be relevant to the proposed project and are discussed below.

C(2)(b) IMPLEMENTING ACTION. Encourage and support local participation in conservation planning and programming as provided for in the Soil and Water Conservation Districts programs.

Construction of the proposed hotel facility will adhere to all applicable polices and guidelines of the Mauna Kea Soil and Water Conservation District, within which the project is located. Specific construction techniques, as well as proposed landscaping and drainage systems, are intended to minimize soil erosion and prevent the deterioration of water quality on-shore and off-shore.

C(4)(c) IMPLEMENTING ACTION. Maintain scenic and natural open space areas as part of a Statewide system of parks.

This action is to be undertaken by DLNR with assistance from the County recreation agency. As discussed in Chapter V, Section 6, there is a need to upgrade and expand Hapuna Beach State Recreation Area. Several new developments along the coast and growth in the Kohala and Kona region as a whole will lead to increased use of the beach and demand for more amenities. Future congestion can be alleviated by developing park facilities at Wailea, which is designated as a Marine Life Conservation District.

#### 4.3 STATE EDUCATION FUNCTIONAL PLAN

This functional plan (State of Hawaii, DOE, April 1985) presents high priority implementing actions for education. All of the actions are to be undertaken by the Department of Education. Therefore, they are not applicable to the South Kohala Resort project.

The DOE has been kept informed during the EIS process so additional needs can be planned and budgeted on a timely basis.

#### 4.4 STATE HIGHER EDUCATION FUNCTIONAL PLAN

There are no policies or implementing actions in this functional plan, prepared by the University of Hawaii (June 1984), of direct relevance to the subject project.

#### 4.5 STATE ENERGY FUNCTIONAL PLAN

The State Energy Functional Plan (State of Hawaii, DPED, June 1984) has as an objective the promotion of energy-efficient design. This relates both to overall land use planning and to specific building design and equipment selection decisions. While specific building designs have not yet been completed, the proposed project will adhere to energy conservation standards wherever practicable.

#### 4.6 STATE HEALTH FUNCTIONAL PLAN

The State Health Functional Plan (State of Hawaii, Dept. of Health, June 1984) "focuses primarily on public health programs under the jurisdiction of the State Health Department." Several of the implementing actions relate to Department of Health (DOH) permit/approval programs that the proposed project is subject to. These include administering the environmental impact statement process; reviewing private wastewater treatment systems; administering permit programs for discharges to the air and to all surface and groundwater, and for treatment and disposal of solid wastes; reviewing plans for new sources of drinking water; and reviewing plans for air conditioning and mechanical ventilation systems for buildings that are used by the public. These topics (wastewater, air quality, water quality, potable water systems, solid waste, and approvals needed) are discussed in terms of the proposed project in various sections of the EIS. The implementing actions also express other areas of concern to the DOH, such as reuse of treated effluent, noise, and medical services; these issues are covered in this EIS as well. Generally, the proposed project will comply with all necessary requirements related to the Department of Health's permitting procedures.

#### 4.7 STATE HISTORIC PRESERVATION FUNCTIONAL PLAN

Essentially all of the policies and implementing actions in the State Historic Preservation Functional Plan (State of Hawaii, DLNR, June 1984b) are directed at State agencies, especially DLNR. The archaeological resources at the South Kohala Resort project site have been the subject of numerous surveys. Both DLNR and County experts have reviewed the findings and recommendations regarding treatment of significant features. The developer intends to follow the recommendations made so that key archaeological sites, the Kauna'oa Point Complex and portions of Trail 9, are preserved and interpretive programs developed. (See Chapter IV, Section 7, Historical and Archaeological Resources.)

#### 4.8 STATE HOUSING FUNCTIONAL PLAN

This State functional plan summarizes the results of the Hawaii Housing Authority (State of Hawaii, Dept. of Social Services and Housing, June 1984) study "to formulate a comprehensive plan for the development, operation, and

management of housing within the State." Most of the policies and implementing actions apply to the government sector. There is presently no housing component contained in the proposed South Kohala Resort project. Nevertheless, the need for employee housing and the potential impact of the proposed resort on economic development and population growth in the general region are all matters of acute concern. The specific alternatives for the provision of employee housing are presently the subject of on-going discussions between Mauna Kea Properties and the appropriate County agencies. One possible alternative is the expansion of Mauna Kea Resort employee housing at Kawaihae Village.

#### 4.9 STATE RECREATION FUNCTIONAL PLAN

The State Recreation Functional Plan (State of Hawaii, DLNR, June 1984) has as Policy D(2) "the securing of public accesses to resources with recreational value." Access to Hapuna Beach will not be affected by development of South Kohala Resort. Current access via the shoreline trail will continue, and public access to the beach and public parking stalls will be provided.

Policy C(1) calls for the maintenance of "an adequate supply of recreation facilities and programs which fulfill the needs of all recreation groups." This policy is addressed to government but is indirectly relevant to the private sector. It is recognized that South Kohala Resort and other new developments in the region will have a cumulative impact on existing recreation facilities and programs. As population growth takes place in Kona and Kohala, in response to economic opportunities generated by the resorts, the demand for additional and varied recreational facilities will grow. Although Hapuna is of particular interest, due to its popularity and location adjacent to the subject project, other recreational needs will have to be met as well (e.g., opportunities for fishing, hiking, boating, camping, etc.). The issue of future beach congestion is discussed in detail in Chapter V, Section 6, of this EIS.

#### 4.10 STATE TOURISM FUNCTIONAL PLAN

The Hawaii State Department of Planning and Economic Development (June 1984) authored this functional plan and considers it a "guide to help coordinate the various sectors of government and private industry toward achieving statewide objectives of the Hawaii State Plan" (p. 2). The role of government in tourism is seen not only as protecting the economic health of the industry, but also as "advancing the social goals of the community" (p. 8). The policies and implementing actions which are most relevant to the private sector, and particularly to the proposed project, are those concerning physical development.

B(2) POLICY: Improve the quality of existing visitor destination areas.

Development of the proposed project will expand leisure-time opportunities available in the South Kohala visitor destination area; for example, the new golf course will meet a recognized need by both visitors and residents. The region is known for its high-quality, luxury accommodations, and South Kohala Resort will be developed in a manner consistent with those standards first set by the existing resorts.



- B(3) POLICY: Encourage greater cooperation between the public and private sectors in developing and maintaining well-designed and adequately serviced visitor industry and related development.

Development of South Kohala Resort is being carried out in close cooperation with the appropriate governmental agencies at both the State and County levels.

- B(3)(a) IMPLEMENTING ACTION: Assure that adequate infrastructure and amenities, such as roads, water, drainage and parks, are provided through a reasonable distribution of financial responsibilities between governmental and private parties.

Developers in the region have cooperated with government and shared in the cost of infrastructure and providing public facilities and services, and the South Kohala Resort developer will continue to do so as the resort is developed.

- B(3)(c) IMPLEMENTING ACTION: Encourage private development of designated visitor destination areas where capital improvements have been made or are planned before encouraging development of other possible visitor destinations.

The proposed South Kohala Resort is in a designated visitor destination area where extensive capital improvements have been made in anticipation of continued growth to fully implement the County's General Plan.

- B(3)(d) IMPLEMENTING ACTION: Encourage the clustering of hotels and resort condominium developments to provide open space and promote energy conservation.

The proposed project will be developed adjacent to the existing Mauna Kea Resort. The clustering of multiple resort facilities in a single area provides greater and varied recreational opportunities for resort visitors, thereby reducing the need for travel outside the resort boundaries.

- B(3)(e) IMPLEMENTING ACTION: Encourage the use of regional sewerage systems by hotel and visitor condominium developments rather than use of individual private systems.

Regional sewage systems make sense in areas more densely developed than the South Kohala resort region. Since Mauna Kea, Mauna Lani, and Waikoloa are separate entities located several miles apart, private systems have been installed to serve each resort. This will be the case for South Kohala Resort as well. However, all the different components within the development -- the hotel, golf course, and various residential projects -- will be served by a single sewerage system. Cost of the system will be assumed by the developer, thus relieving government of this expense.

- B(4) POLICY: Ensure that visitor facilities and destination areas are carefully planned and sensitive to existing neighboring communities and activities.

South Kohala Resort will be built in the vacant area between Mauna Kea Resort and Hapuna Beach State Recreation Area. As proposed, the luxury facilities will be fully compatible with the existing resorts in the region and will greatly enhance the entire resort region. The low-density character of the development, maximization of open space, maintenance of scenic views, and landscaping will all serve to integrate South Kohala Resort into its environment. Resort facilities and activities will be compatible with the recreational use of Hapuna Beach by the public.

B(4)(a) IMPLEMENTING ACTION: Resort development should take place within designated visitor destination areas.

The South Kohala Resort site is within an area designated by the County for resort development.

B(4)(b) IMPLEMENTING ACTION: Ensure that new hotel and condominium projects be set back from the shoreline for access which facilitates and permits use of those areas.

The proposed facilities will be set back from the shoreline in accordance with all appropriate regulations. Access to and along the shoreline will be maintained.

B(4)(d) IMPLEMENTING ACTION: Plan development of resorts in a coordinated manner to minimize loss of public recreational opportunities in designated visitor destination areas.

Few, if any, public recreational opportunities will be lost as a result of the proposed development. Public access to Hapuna Beach will be enhanced. The future cumulative impact of all planned developments in the region, however, will be felt. The planning of South Kohala Resort takes this factor into account, and the upgrading and expansion of Hapuna State Recreation Area is recommended to accommodate the future increased demand for public recreation facilities and services.

D(3)(a) IMPLEMENTING ACTION: Provide relevant information to visitors to foster their understanding of Hawaii's uniqueness in order to minimize damage of natural, historic, and archaeological resources, promote their personal safety and protection, and foster an appreciation of the contribution of Hawaii's residents to the enjoyment of the visitor's experience in Hawaii.

D(3)(b) IMPLEMENTING ACTION: Provide relevant interpretation of, and public access to, sites of archaeological significance whenever feasible, and establish a program to explain Hawaii's history and values to visitors and residents.

The presence of significant archaeological features on the resort site will serve to interpret Hawaiian history, culture, and values to visitors and residents alike. Opportunities for snorkeling in the nearshore waters, as well as the integration of native flora into the resort landscaping, will enable visitors and residents to appreciate the natural resources of the area. Furthermore, the area's geological features provide an excellent means to learn about the volcanic origins of the island.

Regarding the personal safety of visitors, the developer is aware of the occasionally dangerous water conditions in Hapuna Bay, especially during the peak winter months. Guests and residents of South Kohala Resort will be informed about the potential hazards, and beach attendants stationed in the vicinity will help to reduce the chance of visitor mishaps.

#### **4.11 STATE TRANSPORTATION FUNCTIONAL PLAN**

None of the policies or implementing actions in this functional plan (State of Hawaii, Dept. of Transportation, June 1984) address specific developments such as the South Kohala Resort. The overall objective of the plan is to provide for the efficient, safe, and convenient movement of people and goods. The impacts of the proposed development on existing transportation facilities are addressed in the traffic analysis section of this document (Chapter V, Section 2).

#### **4.12 STATE WATER RESOURCES DEVELOPMENT FUNCTIONAL PLAN**

This functional plan, prepared by DLNR (June 1984) "primarily affects State operations, it also involves some actions of ... the private sector. It points out where ... private industry coordination will be needed and ... can help achieve water resources objectives". As the other State functional plans, it does not mandate private sector actions.

The plan presents general objectives and policies for the management of potable water supply, floodplains, agricultural water, and estuarine environments that could be considered relevant to this project. Planning of the resorts in the South Kohala region has been carried out with special attention paid to the availability of potable water sources. The Lalamilo water system -- developed jointly by the State of Hawaii, County of Hawaii, Mauna Kea Properties, Inc., and Mauna Loa Land, Inc. (predecessor to Mauna Lani Resorts, Inc.) -- was intended to accommodate future development and will serve the needs of the first phase of South Kohala Resort. Additional water source development is planned to meet the requirements of the second phase.

### **5.0 HAWAII COASTAL ZONE MANAGEMENT PROGRAM**

The Hawaii Coastal Zone Management Act (Act 188, SLH 1977), which became Chapter 205A, Hawaii Revised Statutes, established State policies for any action affecting the coastal zone. The act established specific objectives and policies in seven broad categories. The relationship of the proposed project to these categories of concern is discussed below.

#### **5.1 RECREATIONAL RESOURCES**

A major Coastal Zone Management (CZM) objective is to "provide coastal recreational opportunities accessible to the public." Development of South Kohala Resort will not limit access to Hapuna Beach, thus assuring continued public use of this popular white sand beach. Furthermore, all appropriate steps will be taken, during both construction and operations, to minimize or avoid any degradation of coastal water quality. Studies demonstrate that concerns about potential contamination by agricultural chemicals applied on

the resort golf course and landscaping are unfounded. Therefore, the recreational value of the bay for snorkeling, body surfing, and other activities will not be diminished.

## **5.2 HISTORIC RESOURCES**

The CZM program seeks to "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." To this end, an exhaustive archaeological study of the makai section of the South Kohala Resort site was conducted. Based on this and numerous other previous investigations of both the makai and mauka properties, archaeological sites were identified, assessed as to their general significance, and recommended for preservation, interpretive development, and/or further data collection. The recommendations will be implemented by the developer. (See Chapter IV, Section 7, of this EIS.)

## **5.3 SCENIC AND OPEN SPACE RESOURCES**

This objective is to "protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources." As discussed in Chapter V, Section 7, of this EIS, open space will be preserved through shoreline setbacks, low-density development, greenbelt buffer zones (including the golf course), and County zoning which creates a transitional "open" zone of 100 to 250 feet between resort improvements and the public shoreline. Furthermore, the low-rise structures will be designed in clusters that conform with the terrain to minimize any adverse impact on scenic view-planes. Landscaping will also serve to integrate the structures with the coastline.

## **5.4 COASTAL ECOSYSTEMS**

Another CZM objective is to "protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems." The proposed project does not involve any direct physical modifications to the nearshore environment. As stated previously, few well-developed marine communities exist in Hapuna Bay and those that do are capable of withstanding large natural sediment loads. In comparison with these natural loads, any additional sediment from land due to construction activity will not be significant. Therefore, the potential for damage to the marine environment from runoff due to project is expected to be very slight. Studies also show that coastal ecosystems will not be disrupted by the application of fertilizers and pesticides on the resort grounds or the use of treated sewage effluent to irrigate the golf course.

## **5.5 ECONOMIC USES**

The objective in this area is to "provide public or private facilities and improvements important to the State's economy in suitable locations." Resort development has been acknowledged as the most appropriate use of land in the region by the Hawaii County General Plan and by the actions of State and County agencies (e.g., by the granting of various permits and by cooperating in the Lalamilo Water System). The policies under this heading state

that reasonable growth in areas designated for visitor industry facilities (which are recognized as coastal dependent developments) is to be permitted, assuring that adverse impacts are minimized. As demonstrated elsewhere in this document, the proposed South Kohala Resort is not expected to cause any significant adverse impacts; rather, it is expected to have positive effects on the economy of the region, island, and state. Mitigation measures will be taken to avoid or minimize potential adverse impacts.

## **5.6 COASTAL HAZARDS**

The CZM program aims to "reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence." No development within the South Kohala Resort will occur in zones of 100-year flooding from streams, storm waves, or tsunamis. Erosion will not be a major hazard due to low rainfall and the characteristics of the soil; landscaping will serve to reduce any erosion. The project site is in an area not very susceptible to the hazard of subsidence.

Measures will also be taken to prevent drownings in the potentially dangerous high surf of Hapuna Bay by educating resort guests and residents about these hazards.

## **5.7 MANAGING DEVELOPMENT**

Finally, the CZM program is intended to "improve the development review process, communication, and public participation in the management of coastal resources and hazards. This EIS is a tool for communicating the impacts of the proposed resort at an early stage of planning. It is intended to facilitate participation in the planning and review process. The proposed plan will require a variety of development permits before it can be implemented. These will afford numerous opportunities for the Hawaii Coastal Zone Management Program authorities to place conditions on the project which will assure the proper management of coastal resources.

In addition, Mauna Kea Properties works with the South Kohala Resort Advisory Committee, which includes representatives of major community organizations, to participate in the planning process.

## **6.0 COUNTY SPECIAL MANAGEMENT AREA**

The portion of the project area makai of Queen Ka'ahumanu Highway falls within the "Special Management Area" (SMA) and is therefore subject to the SMA Rules and Regulations of the County of Hawaii. The relationship of the proposed project to the SMA guidelines in the Hawaii County Planning Commission's Rule No. 9 is covered here. Following are summaries of the guidelines and brief comments which note the extent to which the proposed project is believed to be consistent with them. The objectives and policies of the State's Coastal Zone Management Act provide the general framework for the County's SMA guidelines (see above).

Guideline A.1 This guideline seeks to minimize alterations to any body of water.

No alterations to any body of water will be made as part of the subject project, nor will the quality of offshore waters be adversely affected as a result of the development.

Guidelines A.2 & 3 These guidelines seek to minimize reductions in the availability and/or access to beaches and other recreational areas and shoreline areas due to development.

Availability of recreational opportunities at Hapuna Beach and other shoreline areas will not be reduced due to the proposed project. (See Chapter V, Section 6, for a detailed discussion of the cumulative impact of all planned developments in the region on recreational facilities and services.) Public access to and along the shoreline will be maintained.

Guideline A.4 This guideline concerns the visual impacts of the proposed development.

Due to the low-rise, low-density character of the proposed development and planned use of landscaping, visual impacts will be minimized. This issue is discussed fully in Chapter V, Section 7 of this EIS.

Guideline A.5 This guideline aims at minimizing development that adversely affects water, scenic, or wildlife resources, or that adversely affects existing or potential agricultural uses of the land.

Water and scenic resources will not be adversely affected by the proposed development. There are no significant wildlife resources, nor any existing or potential agricultural uses, associated with the project site. All of these issues are fully covered in other sections of this document.

Guidelines B.1,2 & 3 These guidelines state that no development shall be approved unless it has no significant adverse environmental effects, and is found consistent with Chapter 205A, HRS, the Hawaii County General Plan, the Hawaii County Zoning and Subdivision Codes, and other applicable ordinances.

This EIS analyzes the potential of the proposed project to create adverse effects and outlines the mitigation measures that will be taken to avoid them or minimize them to insignificant levels. The plan's consistency with Chapter 205A, HRS, and with the Hawaii County General Plan is discussed in this chapter.

Guideline C.1 & 2 These guidelines seek to ensure access to beaches, recreation areas, and natural reserves, and to ensure that adequate recreation and wildlife preserves are maintained.

The South Kohala Resort will not adversely affect access to and along beaches, recreational areas, or natural reserves. Development of the site will not impact any wildlife preserve, nor utilize land with unique recreational potential.

Guideline C.3            This guideline concerns solid and liquid waste management.

Wastes from the proposed development will be handled according to applicable County, State, and Federal standards, thereby minimizing adverse effects on SMA resources (see Chapter V, Sections 5.6 and 5.7). Effluent from the sewage treatment plant will be treated and used for golf course irrigation. Solid waste will be disposed of at County landfills, with collection handled by the developer.

Guideline C.4            This guideline seeks to minimize adverse impacts resulting from alterations to existing landforms and vegetation.

Existing landforms will not be changed except in minor ways to improve drainage, provide adequate building sites, set road alignments, and establish desirable golf fairway topography.

Kiawe and grasses are the predominant vegetation. In a botanical survey of the area, no proposed, listed, or candidate endangered or threatened plant species were observed. It is anticipated that some portions of the existing vegetation will be left intact, allowing the incorporation into the development of natural landscape elements, including endemic trees and shrubs.

Guideline C.5            This guideline seeks to minimize adverse environmental or ecological impacts due to the project.

The developer is committed to minimizing adverse environmental or ecological impacts. The multi-level review and permit process that the project must undergo before it is implemented will ensure that mitigation measures are made conditions to development.

Guideline C.6            This guideline states that the proposed project must be consistent with the General Plan.

As outlined in the following section, the project is consistent with the Hawaii County General Plan.

## 7.0    HAWAII COUNTY GENERAL PLAN

The Hawaii County General Plan (County of Hawaii, 1971 as amended) contains both a set of policies and land use maps showing the location of desired land uses for the entire island. The latter are referred to as "Land Use Pattern Allocation Guide Maps" (LUPAG maps). According to the County General Plan LUPAG map, the proposed development is consistent with the County's long-range land use policies for the area. The lands makai of the Queen Ka'ahumanu Highway are designated for resort and resort-related uses --

specifically for Resort, Medium Density Urban, and Open. Mauka of the highway, lands were originally designated Open and Low Density Urban in the 1971 LUPAG maps. By amended ordinance in 1979, these mauka lands were reclassified to Alternate Urban Expansion. Areas so designated are allowed alternate development patterns when, among other reasons, designated urban areas develop too slowly or become largely developed, or when developers propose to develop marginally acceptable areas and extend their own infrastructure. (See Figure VI-2.)

The County General Plan identifies Kawaihae as a resort center within a major resort area (the South Kohala coastline). A major resort area is "a self-contained resort destination area which provides basic and support facilities for the needs of the entire development." (County of Hawaii, 1971:95) Such facilities include hotel rooms, residential units (both single- and multi-family), recreational facilities, and necessary infrastructure.

The Resort component of the land use element of the General Plan states that resort uses shall be developed in areas adequately served by essential services and other infrastructure. South Kohala Resort will be provided with all essential utilities and improvements, including water, sewer, electricity, telephone, CATV, solid waste collection, and roads. As discussed in Chapter V, other essential services and facilities exist in the area (e.g., airports, harbors, schools, health care facilities, police and fire protection).

Development of South Kohala Resort is also consistent with the economic element of the General Plan. The project will increase employment opportunities for residents and help to strengthen the visitor industry. It will provide additional personal income and, hence, expand County and State revenue. Elaboration of the project's socio-economic benefits are contained in Chapter V, Section 1.

The Hawaii County General Plan is currently undergoing review. The South Kohala Resort is consistent with the proposed revised General Plan policies and LUPAG maps.

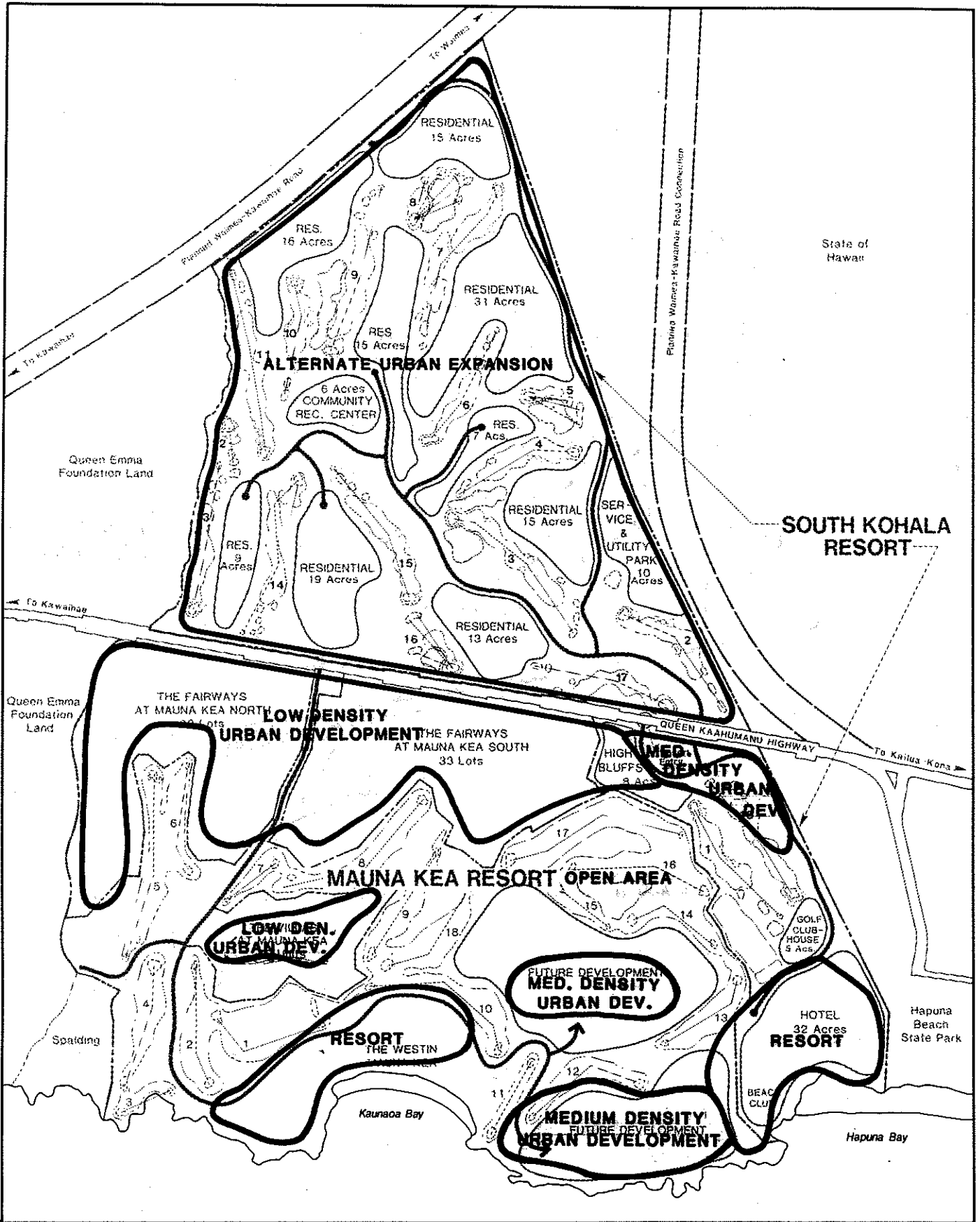
## **8.0 HAWAII COUNTY ZONING**

The South Kohala Resort lands are in general appropriately zoned as shown in Figure VI-3. Before 1986, the hotel and beach club site was appropriately zoned for its intended use, V-1.25 resort, and the High Bluffs site designation was RS-20. In January 1986, rezoning was granted for the mauka lands and adjustments made in the makai lands zoned Open and CV-10.

## **9.0 PLANS OF NEARBY COMMUNITIES**

No regional plan has been prepared for South Kohala. The following plans were examined to note the role of the South Kohala resorts in the planning for these nearby communities.





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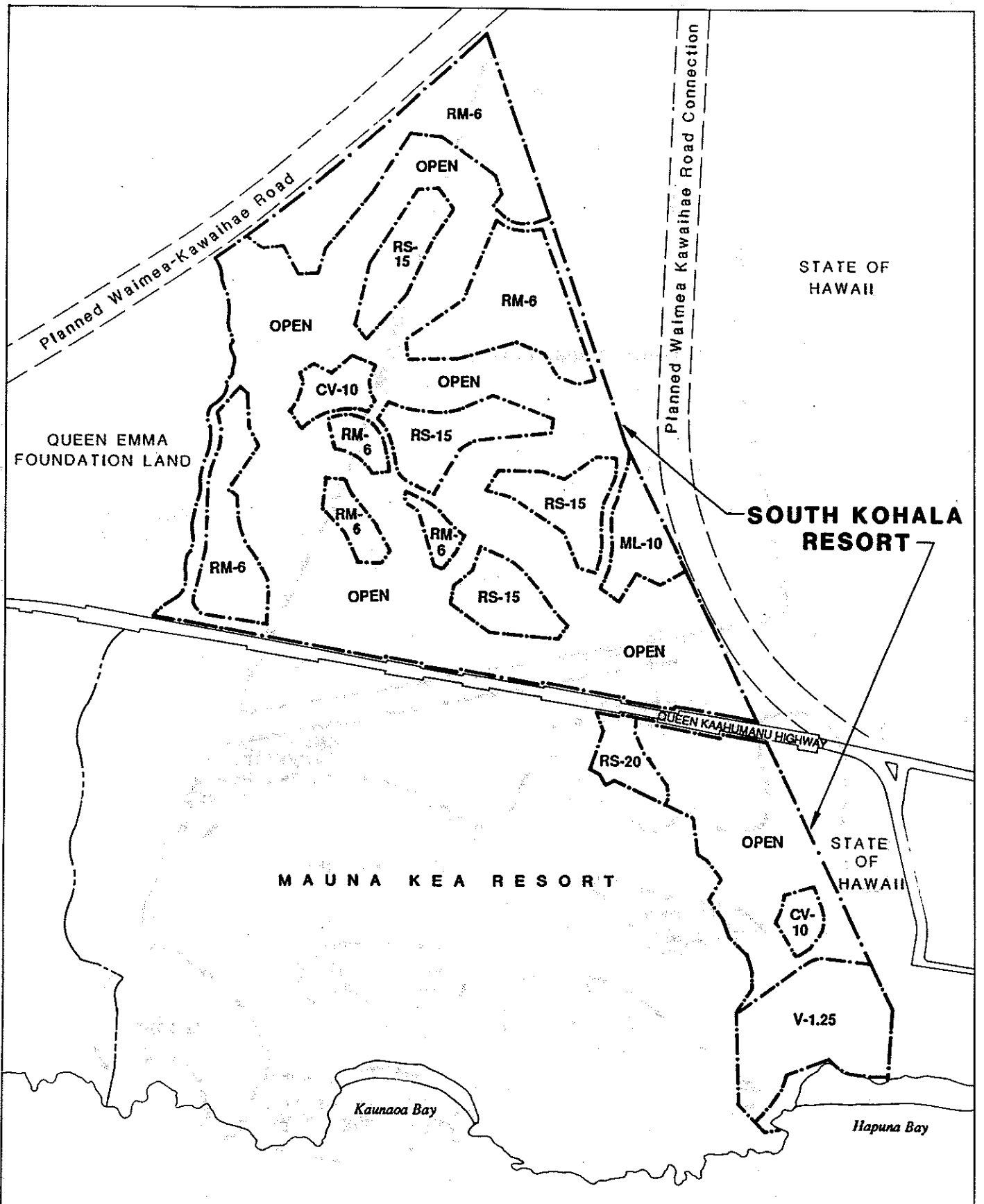
Prepared By: BELT COLLINS & ASSOCIATES  
Honolulu, Hawaii September 1987



NORTH

Figure VI-2  
COUNTY GENERAL PLAN

SOUTH KOHALA RESORT  
Kohala Coast Resort Region • South Kohala, Hawaii



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Prepared By: BELT COLLINS & ASSOCIATES

Honolulu, Hawaii September 1987



NORTH

**Figure VI-3  
COUNTY ZONING**

**SOUTH KOHALA RESORT**  
Kohala Coast Resort Region • South Kohala, Hawaii

## 9.1 NORTH KOHALA COMMUNITY DEVELOPMENT PLAN

There are numerous references in the North Kohala Community Development Plan (Phillips Brandt Reddick, November 30, 1984) to the employment opportunities and economic base which the South Kohala resorts have provided for North Kohala residents. It is reiterated several times that South Kohala tourism development filled the gap left by the closing of the sugar plantations in North Kohala. And in turn, the South Kohala resorts have depended upon North Kohala as a source of employees.

A certain amount of growth in residential housing for visitor industry employees is expected in North Kohala, but the extent to which such development might be directed to the southern portion of the district (in the vicinity of Kohala Estates and Ranch), which is closer to the South Kohala resort employment centers, has not been determined.

The plan mentions the need for expanded public bus service between the North Kohala towns and the South Kohala resorts.

## 9.2 KONA REGIONAL PLAN

The Kona Regional Plan (County of Hawaii, Planning Dept., November 28, 1983) has references to the South Kohala Resorts only in the Economic Activities and Land Use chapters. The relationship between visitor facilities in the Kona and Kohala districts is noted several times, and competition from the South Kohala destination resorts is stressed. Also mentioned are opportunities for industrial expansion north of Kailua, fueled by both the South Kohala resorts and Kona's visitor market/population growth. In addition to jobs provided directly by the resorts, indirect employment opportunities will be created for Kona residents in the industrial and service sectors.

As the economies of the Kohala and Kona Districts become more and more interdependent, land use planning will have to be coordinated. This regional plan recognizes that the existing resort areas in both South Kohala and Kona should be firmly established before additional ones are developed.

## 9.3 WAIMEA DESIGN PLAN

The Waimea Design Plan (Phillips Brandt Reddick, May 1984:17) makes one brief mention of the prospects for continued growth in the town due to the resort developments on the coast.

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## CHAPTER VII

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## CHAPTER VII

### RELATIONSHIP BETWEEN SHORT-TERM USES AND THE ENVIRONMENT AND MAINTENANCE OF LONG-TERM PRODUCTIVITY AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Consisting of arid, sparsely vegetated land unsuited to agricultural use, the project site is adjacent to the world-class Mauna Kea Resort and located in a region designated by the State and County for resort development. Conditions for resort use are ideal, and future options for alternate uses of this land, other than resort use, are limited. The land will be committed to long-term use for hotel operations and resort residential units.

The resort is not expected to pose any long-term risks to health and safety. It is obviously in the interest of the developer to provide a healthful, safe, and enjoyable experience for guests and residents.

Existing public access to and along the shoreline will be preserved. The recreation resources of Hapuna Beach will not be diminished by the development itself, although it is recognized that the cumulative impact of all planned development in the region will lead to increased use of this popular beach park.

No significant long-term losses of resources are expected. Neither the pristine quality of Hapuna Bay nor the marine organisms inhabiting its waters will be adversely affected by the proposed development. Negative impacts on terrestrial flora and fauna are also unlikely. To enhance the resort environment, the developer intends to incorporate native plant species into the landscaping whenever possible. Significant archaeological sites on the property will be preserved in accordance with recommendations made by archaeological consultants and approved by the State and County.

Long-term benefits of the South Kohala Resort development include increased employment opportunities and related economic benefits, not only for the residents of West Hawaii but the island as a whole. Additional revenue will be generated to support State and County services (a favorable revenue-cost ratio is projected). De facto and resident population growth will follow the development, but effects of this growth have been weighed and the benefits found to offset the impacts.

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## CHAPTER VIII

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## CHAPTER VIII

### OFFSETTING CONSIDERATIONS OF GOVERNMENTAL POLICIES

The potentially adverse effects of the proposed project are generally offset by the economic benefits to be derived from it. As discussed in Chapter VI, development of South Kohala Resort is consistent with government plans and policies. The State and County have made a considerable investment to provide public infrastructure along the West Hawaii coast and have encouraged quality resort development in the region. Given the decline of the sugar industry and Hilo's diminishing position as a visitor destination area, tourism in West Hawaii is expected to provide the primary economic support for the Big Island, augmented by diversified agriculture and high technology activities.

Development of South Kohala Resort will allow the countervailing economic benefits to be realized while minimizing the adverse environmental impacts. Each of the potential significant impacts can be minimized or avoided altogether by implementation of the proposed mitigation measures.

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## CHAPTER IX

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## CHAPTER IX

### UNRESOLVED ISSUES

Several issues raised by the proposed project remain to be resolved. The outcome of some cannot be known in detail until development actually occurs. However, it is expected that all of the issues can be resolved without undue difficulty through mitigation measures. The most important of the issues are identified below.

#### 1.0 REGIONAL GROWTH

Much of the analysis and the conclusions reached in this EIS regarding population, housing, social, and traffic impacts are based on assumptions made about the timing and extent of West Hawaii resort development over the next ten years. Taking currently available information, some of it "firm" and others more speculative at this point, a scenario is created and used as a basis for estimating the above impacts. It is noted that the scenario for 1994-1998 (based on official State figures) suggests a sustained level of new resort construction that the island of Hawaii has never experienced in its history, so the impacts for this period may be overestimated. Given this uncertainty, the actual cumulative impacts may vary significantly from the projections made herein.

Another important point is that these cumulative impacts are essentially outside the control of any one resort developer, and that the proposed mitigation measures must be carried out in a coordinated fashion by both the public and private sectors. How government, developers, and the community respond to these issues will determine the actual impacts.

#### 2.0 HOUSING AVAILABILITY AND LOCATION

South Kohala Resort workers are expected to initially require between 129 and 157 new housing units in 1993, when the hotel opens and the first residential units are completed. The demand for new housing is estimated to range from 14 to 16 units per year, resulting in a combined total demand of 200 to 234 units in 1998, the project completion date. About a quarter of the households will have incomes lower than 80 percent of the median and, hence, may need housing assistance. Employees with household incomes above 80 percent of the median are expected to find residences within the private housing market.

Mauna Kea Properties is engaged in discussions with the County on how these needs will be met. It has stated its intention to expand the existing Kawaihae Village to satisfy employee housing requirements. It would also consider participating in the proposed Kealakehe project near Kona. The exact outcome of the discussions and the resulting implications are presently unknown. However, a combination of available housing on the open market (a number of new projects in the area are planned) and housing assistance provided by the developer will most likely meet the projected needs.

Still unresolved are the actual population and housing impacts resulting from all planned resorts in the region, taking into account both on-site and off-site jobs, as well as induced and non-induced in-migration.

The exact location of off-site population growth and facilities as a result of the proposed development is unknown at this time. State and County planning and zoning policies will ultimately determine where a supply of new housing will be permitted. Also to be taken into account are factors such as where private developers are apt to build new housing and future employees' preferences.

### **3.0 TRANSPORTATION FACILITIES**

As development proceeds in West Hawaii, traffic volumes will increase and existing roadways will become congested. The need for improvements to Queen Ka'ahumanu Highway and other major roadways and intersections is a function of projected regional growth, not just the South Kohala Resort or any other single project. It is expected that the exact design of these improvements and when they will be necessary will be determined by governmental entities concerned with regional infrastructure planning and construction. The same can be said for the anticipated expansion and upgrading of Keahole Airport.

Traffic projections will vary according to the assumptions made. Those assumptions made for the South Kohala Resort traffic study are listed in Chapter V, Section 2.1. It is recognized that other equally valid assumptions might be made in another study or by other individuals, resulting in different projections.

The traffic generated by secondary and tertiary population growth is also an unresolved issue.

### **4.0 WATER SUPPLY**

Water demand projections are based on the actual demand at resorts considered comparable to the South Kohala Resort. Whether these standards are appropriate will not be known until the new resort becomes operational. It is worth noting that these projections do not take into account the proposed water conservation measures.

The water requirements for South Kohala Resort beyond 1993 will depend on the timing and extent of development of the mauka lands. Current projections indicate that a new water source will have to be developed to accommodate this second phase. The location of the source, quantity and quality of the water, development costs, and legal requirements are as yet unknown.

### **5.0 HAPUNA BEACH CONGESTION**

Also unresolved is the degree to which development of the project would contribute to higher levels of beach use and a less satisfactory experience to current users of Hapuna. It is unlikely that a consensus could be reached on

this issue since perception as to what constitutes "congestion" can be very subjective. Actual beach count data suggests that the section of Hapuna Beach fronting the planned development is not heavily used at this time, probably due to its distance from parking and amenities. Experience at Kauna'oa Beach shows that Westin Mauna Kea guests do use the beach area, but also take advantage of other resort recreational opportunities such as golf and tennis, and this will probably be the case with guests at South Kohala Resort. In addition to guests and residents from the proposed resort, there are the more significant impacts of population growth caused by overall regional development. The extent of this impact, as well as government strategies for mitigating the impact, are unknown. Proposals are made in this EIS to expand/upgrade the Hapuna Beach State Recreation Area and develop park facilities at neighboring Waialea Bay and other West Hawaii beaches to alleviate future congestion at Hapuna.

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## CHAPTER X

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## CHAPTER X

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## **CHAPTER XI**

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## CHAPTER XI

### CONSULTED PARTIES AND THOSE WHO PARTICIPATED IN THE PREPARATION OF THE EIS

#### 1.0 CONSULTED PARTIES

The notice of availability of the EIS Preparation Notice (EISPN) for the South Kohala Resort was published in the OEQC Bulletin by the Office of Environmental Quality Control on December 8, 1986. The agencies, organizations, and individuals listed below were sent copies of the EISPN with the Environmental Assessment (EA) and were asked to comment on the project. Everyone believed to have an interest in the project or who requested consulted party status was included in the mailing. Those who responded to the request for comments are marked with an asterisk (\*) and copies of the correspondence with them are reproduced in Chapter XII.

#### **Federal Agencies**

- \* U.S. Army Corps of Engineers
- \* U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Department of Interior, Fish and Wildlife Service
- \* U.S. Department of Interior, Geological Survey, Water Resources Division
- U.S. Environmental Protection Agency

#### **State Agencies**

- \* The Honorable John Waihee, Office of the Governor
- \* Department of Accounting and General Services, Division of Public Works
- \* Department of Agriculture
- Department of Budget and Finance
- \* Department of Defense, Office Of Adjutant General
- \* Department of Education
- \* Department of Hawaiian Home Lands
- \* Department of Health, Environmental Protection and Health Services Division
- \* Department of Labor and Industrial Relations
- \* Department of Land and Natural Resources
- \* Department of Planning and Economic Development
- \* Department of Social Services and Housing, Hawaii Housing Authority
- \* Department of Taxation
- \* Department of Transportation
- Office of Environmental Quality Control
- Office of Hawaiian Affairs, Hilo
- \* Office of Hawaiian Affairs, Honolulu
- University of Hawaii, Environmental Center
- \* University of Hawaii, Water Resources Research Center



## County Agencies

- The Honorable Dante K. Carpenter, Mayor of the County of Hawaii
- \* Civil Defense Agency
- Department of Finance
- Division of Industrial Safety
- Planning Department
- \* Department of Public Works
- \* Department of Parks and Recreation
- Department of Research and Development
- \* Department of Water Supply
- \* Fire Department
- Hawaii Redevelopment Agency
- Office of Housing and Community Development
- \* Police Department

## Lawmakers

- The Honorable Daniel K. Inouye, U.S. Senate
- \* The Honorable Spark M. Matsunaga, U.S. Senate
- \* The Honorable Daniel K. Akaka, U.S. House of Representatives
- The Honorable Patricia Saiki, U.S. House of Representatives
- The Honorable Richard Henderson, Hawaii State Senate
- The Honorable Richard M. Matsuura, Hawaii State Senate
- The Honorable Malama Soloman, Hawaii State Senate
- The Honorable Virginia Isbell, Hawaii State House of Representatives
- The Honorable Andrew Levin, Hawaii State House of Representatives
- The Honorable Robert Lindsey, Hawaii State House of Representatives
- \* The Honorable Wayne Metcalf, Hawaii State House of Representatives
- The Honorable Harvey Tajiri, Hawaii State House of Representatives
- The Honorable Dwight Takamine, Hawaii State House of Representatives
- The Honorable James L.K. Dahlberg, Hawaii County Council
- The Honorable Frank De Luz, III, Hawaii County Council
- The Honorable Takashi Domingo, Hawaii County Council
- The Honorable Robert Herkes, Hawaii County Council
- The Honorable Lorraine Jitchaku-Inouye, Hawaii County Council
- The Honorable Russel S. Kokubun, Hawaii County Council
- The Honorable Merke K. Lai, Hawaii County Council
- The Honorable Spencer Kalani Schutte, Hawaii County Council
- The Honorable Stephen K. Yamashiro, Hawaii County Council

## Others

- AFL-CIO Building Trades Council, Island of Hawaii
- \* Thomas N. Beach
- Big Island Business Council
- \* Dave DeCleene
- Filipino Cultural Club
- GASCO, Inc., Hawaii Division
- W.R. Glover
- Pat Godfrey
- Judy Graham
- Marian Gushiken
- Thomas Hagen

- Hawaii Hotel Association, Hawaii Chapter
- Hawaii Island Board of Realtors
- Hawaii Island Economic Development Board
- \* Hawaii Leeward Planning Conference
- Hawaiian Electric Light Company, Inc.
- \* Hawaiian Telephone Company, Hawaii Island Manager
- William Heacox
- Ka Ohana O Kalae
- Kanoelehua Industrial Area Association
- I. Michael Kassel
- Kawaihae Canoe Club
- Kohala Businessmen's Association
- Kohala Coast Resort Association
- Kohala Community Association
- Kona Board of Realtors
- Kona Conservation Group
- Kona-Kohala Chamber of Commerce
- \* Life of the Land, Big Island Chapter
- Moku Loa Group, Hawaii Chapter
- Sierra Club
- Hugh Montgomery
- Na Ala Hele
- \* Jacquelyn Prell
- Puako Community Association
- \* Save Hapuna Initiative Petitioners Committee
- William Slattery
- \* South Kohala Resort Advisory Committee
- Laura Spiegel
- Waimea Hawaiian Civic Club
- Waimea-Kawaihae Community Association
- \* Pamela Washburn
- \* Jan Walker
- West Hawaii Committee
- \* F. Reeve Williams
- Glen Winterbottom

**2.0 ORGANIZATIONS AND INDIVIDUALS WHO ASSISTED IN THE PREPARATION OF THIS EIS**

The environmental impact statement was prepared for the South Kohala Resort by Belt Collins & Associates with input provided by subconsultants. The following were involved:

**Belt Collins & Associates**

- |                |                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| James R. Bell  | Principal in Charge; planner and registered landscape architect with masters degree in urban planning.                            |
| Anne L. Mapes  | Project Manager; contributed to organization and content of all sections; planner with masters degree in business administration. |
| Susan S. Rutka | Planner; contributed to writing and/or editing of all sections; M.A. in political science.                                        |

Edward H. Iida, P.E. Civil Engineer; contributed to sections on traffic impact analysis and infrastructure; professional engineer with B.S. in civil engineering.

Malcolm A. Cortez Junior Civil Engineer; contributed to sections on traffic impact analysis; B.S. in civil engineering.

Glen T. Koyama Planner; provided land planning input; masters degree in urban planning.

Karon Y. Uyechi Graphic Designer; contributed graphics and maps; bachelors degree in fine arts.

Audrey Chun Graphic Designer; contributed graphics and maps; bachelors degree in fine arts.

Lynn S. Fukuhara Word Processor; provided typing support.

**Subconsultants**

Phillip L. Bruner Conducted avifaunal and feral mammal survey; environmental consultant and ornithologist with M.S. in zoology.

Ming Chew Prepared the market analysis; masters degree in business administration.

John R.K. Clark Provided input for section on Hapuna Beach impacts and mitigation measures; author of books on the beaches of the Big Island, Oahu, and Maui.

David R. Curry Contributed to the section on socioeconomic considerations; research associate with Community Resources, Inc.; masters degree in urban and regional planning.

Steven J. Dollar Conducted baseline assessment of the marine environment and carried out sampling and analysis for the agricultural chemicals impact study; Ph.D. in marine biology.

Yoichi Ebisu Provided analysis of noise impacts; consulting acoustical engineer with M.S. in engineering acoustics.

Richard E. Green Contributed to the agricultural chemicals impact studies; Ph.D. in soil physics.

Erin Marie Hall Conducted botanical survey for the section on terrestrial flora; environmental consultant with M.A. in biogeography.

Jim Hayes Provided artist's concept of views of resort from Hapuna Beach.

John M. Knox                      Contributed to the section on socioeconomic considerations; President of Community Resources, Inc. specializing in survey research and social impact analysis; Ph.D. in psychology.

Charles L. Murdoch                Contributed to the agricultural chemicals impact studies; Ph.D. in agronomy.

Doug Peebles                      Photographer for Hapuna Beach photos.

David W. Rae                      Contributed to the section on housing impacts; research associate with Community Resources, Inc.; masters degree in urban and regional planning.

Barry D. Root                     Provided analysis of air quality impacts; air quality consultant with masters degree in public health (environmental management).

Paul H. Rosendahl                Contributed to the section on historic and archaeological resources; principal archaeologist with Ph.D. in anthropology.

Steven A. Tanimura              Contributed to the section on fiscal impacts; consultant with Capital Managers, Inc.; M.A. in economics.

Alan T. Walker                    Contributed to the section on historic and archaeological resources; consulting archaeologist with Paul H. Rosendahl, Ph.D., Inc.; B.A. in anthropology.

Bay K.C. Yee                      Contributed to the section on fiscal impacts; consultant with Capital Managers, Inc.; masters degree in business administration.

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## *CHAPTER XII*

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## CHAPTER XII

### COMMENTS RECEIVED DURING THE EIS PREPARATION NOTICE COMMENT PERIOD AND RESPONSES

The agencies and individuals listed in Chapter XI were all sent copies of the Environmental Impact Statement Preparation Notice (EISPN) with the Environmental Assessment (EA) and a transmittal letter requesting comments. Copies of the EISPN and the transmittal letters sent to these organizations and individuals are reproduced here along with copies of our responses to them. Some agencies received individualized transmittal letters, requesting specific information relative to their activities and/or responsibilities. Copies of letters to and from these agencies are also included in this chapter. Those agencies and individuals who responded to the transmittal letter with a "no comment" received no letter in response.

In addition, a number of individuals/groups requested to be consulted parties in the EIS process. These requests and our transmittal letters are reproduced herein, as well as any comments received and letters written in response to those comments.

#### **AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO RESPONDED TO THE STANDARD TRANSMITTAL LETTER WITH "NO COMMENT":**

##### **Federal Agencies**

U.S. Department of Interior, Geological Survey, Water Resources Division

##### **State Agencies**

Department of Accounting and General Services, Division of Public Works  
Department of Defense, Office of Adjutant General  
Department of Taxation  
Office of Hawaiian Affairs  
University of Hawaii, Water Resources Research Center

#### **AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO RESPONDED TO THE STANDARD TRANSMITTAL LETTER WITH COMMENTS:**

##### **Federal Agencies**

U.S. Army Corps of Engineers  
U.S. Department of Commerce, National Marine Fisheries Service

##### **State Agencies**

Department of Agriculture  
Department of Hawaiian Home Lands  
Department of Health, Environmental Protection and Health Services  
Division  
Department of Labor and Industrial Relations

Department of Planning and Economic Development  
Department of Social Services and Housing, Hawaii Housing Authority  
University of Hawaii, Water Resources Research Center

**County Agencies**

Civil Defense Agency  
Department of Public Works  
Department of Water Supply  
Fire Department

**Lawmakers**

The Honorable Spark M. Matsunaga, U.S. Senate  
The Honorable Daniel K. Akaka, U.S. House of Representatives  
The Honorable Wayne Metcalf, Hawaii State House of Representatives

**Others**

Thomas N. Beach  
Hawaii Leeward Planning Conference  
Hawaiian Telephone Company, Hawaii Island Manager  
Life of the Land, Big Island Chapter  
Jacquelyn Prell  
Save Hapuna Initiative Petitioners Committee  
South Kohala Resort Advisory Committee

**AGENCIES, ORGANIZATIONS, AND INDIVIDUALS SENT INDIVIDUALIZED TRANSMITTAL LETTERS:**

(Note: Responses with comments were received from all except the Governor's Office, which responded with no comments.)

**State Agencies**

The Honorable John Waihee, Office of the Governor  
Department of Education  
Department of Land and Natural Resources  
Department of Transportation

**County Agencies**

Department of Parks and Recreation  
Police Department

**INDIVIDUALS/GROUPS WHO REQUESTED CONSULTED PARTY STATUS:**

(++ Indicates that comments were received.)

++Dave DeCleene  
W.R. Glover  
Pat Godfrey  
++Judy Graham

Marian Gushiken  
Thomas Hagen  
William D. Heacox  
Ka Ohana O Kalae  
I. Michael Kassel  
Hugh R. Montgomery  
William T. Slattery  
++Laura Spiegel  
++Jan Walker  
++Pamela S. Washburn  
++F. Reeve Williams  
Glen M. Winterbottom





COUNTY OF HAWAII

PLANNING DEPARTMENT

25 AUPUNI STREET • HILO, HAWAII 96720  
(808) 961-6386

DANTE K. CARPENTER  
Mayor  
ALBERT LONO LYMAN  
Director  
JIMMA A. FIANAIKA  
Deputy Director

November 28, 1986

Office of Environmental Quality Control  
Kekuaaoa Building, Room 115  
465 South King Street  
Honolulu, HI 96813

Gentlemen:

Preparation Notice - Environmental Impact Statement

Enclosed please find one original and three copies of an environmental assessment and preparation notice for the proposed resort at Ouli, south of the existing Mauna Kea Beach Hotel, South Kohala, Island of Hawaii (Tax Map Key: 6-2-02:12 & 13, 6-6-02:37 & 38).

The applicant, Mauna Kea Properties, Inv., has filed an application for a Shoreline Setback Variance, thus necessitating compliance with Chapter 343 requirements.

Comments on the EIS Preparation Notice should be sent to the petitioner's consultants:

Ann L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

With copies to:

Albert Lono Lyman, Director  
Planning Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Office of Environmental Quality Control  
November 28, 1986  
Page 2

Should you have any questions, please feel free to contact our office.

Sincerely,

  
ALBERT LONO LYMAN  
Planning Director

VKG:aeb

encl.

cc: Ann L. Mapes  
Belt, Collins & Associates

ENVIRONMENTAL ASSESSMENT AND NOTICE OF PREPARATION  
OF AN ENVIRONMENTAL IMPACT STATEMENT

South Kohala, Island of Hawaii

APPLICANT:

Mauna Kea Properties, Inc.  
c/o Westin Mauna Kea beach hotel  
P.O. Box 218  
Kamuela, Hawaii 96743

ACCEPTING AGENCY:

Planning Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

PROPOSED ACTION:

Development of a self-contained resort community. The focus of the resort would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course and clubhouse. Also planned are improvements to the shoreline setback area, multifamily and single-family residential units, unimproved lots, a recreation community center, a beach club, and support facilities.

REASON FOR CHAPTER  
343 H.R.S.

APPLICABILITY:

Shoreline Setback Variance

DETERMINATION:

Environmental Impact Statement, Chapter 343,  
HRS, is required.

CONTACT PERSON:

Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813  
Phone: (808) 521-5361

PROJECT LOCATION:

Ouli 1  
South Kohala, County of Hawaii  
Tax Map Keys 6-2-02: 12 & 13; 6-6-02: 37 & 38

I. PROJECT DESCRIPTION  
Proposed Project

Mauna Kea Properties, Inc. proposes to develop a

self-contained oceanfront resort at Ouli 1, South Kohala, Hawaii. On its seaward boundary, the proposed site is situated between Hapuna Bay and Kaunaoa Point, adjacent to the existing Mauna Kea Resort. The project site is both mauka and makai of Queen Kaahumanu Highway, spanning about 540 acres, of which about 140 acres makai of the highway are in the SMA area. The South Kohala Resort would be developed as a separate entity from the existing Mauna Kea Resort.

The focus of the resort will be a luxury-class hotel and tennis complex, and an 18-hole championship golf course and clubhouse. Also planned are multifamily and single-family residential units, unimproved lots, a beach club, a recreation community center, and support and maintenance facilities.

Seaward of Queen Kaahumanu Highway in the Special Management

Area will be the hotel and tennis complex, shoreline improvements, The Bluffs condominium project, The High Bluffs single-family residential development, the golf clubhouse and driving range, as well as two golf holes. There will be a left-turn channel from Queen Kaahumanu Highway into the resort property toward an entry station. The entry road will turn mauka and go under the highway to access the mauka lands.

Development is expected to proceed incrementally, with the hotel, tennis complex and shoreline area first slated to be developed. The golf facility is planned to be completed within the

year prior to the hotel opening. The residential projects will be completed incrementally, according to market demand.

| Area  | Use                                      | Acres | Planning Range |
|-------|------------------------------------------|-------|----------------|
| Makai | Hotel                                    | 32    | 300 - 350      |
|       | Multifamily Residential<br>(The Bluffs)  | 38    | 150 - 250      |
|       | Single-Family Residential                | 8     | 10 - 15        |
|       | Golf Course, Open Space,<br>Roads, etc.  | 53    |                |
|       | Golf Clubhouse                           | 5     |                |
|       | Beach Club                               | 4     |                |
|       | TOTAL                                    | 140   |                |
| Mauka | Multifamily Residential                  | 90    | 400 - 600      |
|       | Single-Family Residential                | 50    | 100            |
|       | Golf Course, Open Space,<br>Roads, etc.  | 244   |                |
|       | Halfway Station and<br>Recreation Center | 6     |                |
|       | Utility Park                             | 10    |                |
|       |                                          | TOTAL | 400            |

Construction cost of South Kohala Resort, including facilities and infrastructure, is expected to amount to over \$300,000,000.

**Proposed Shoreline Improvements**

The shoreline area within the project site stretches from the State land at its southern boundary to the Mauna Kea Resort at its northern boundary, Kaunaoa Point. Its southernmost portion fronts part of the sandy beach at Hapuna Bay. Gently sloping in terrain, the shoreline area has been maintained in its natural state. It is characterized by low trees, shrubs and grasses typical of dry areas along the west Hawaii coast. The area is generally rocky with some areas of thin sand covering lava rock.

The shoreline area is readily accessible to visitors and the general public through an existing six-foot nature trail within the

40-foot shoreline setback area. Some sections of the trail are open and others shaded by trees. At either end of the trail within the project area are signs indicating "Shoreline Public Access."

The shoreline area fronting the proposed Makai South Kohala Resort facilities will essentially be maintained in open space with some improvements to enhance the physical setting and to improve public usage and safety.

Grading is proposed to improve the existing shoreline grade and to accommodate foundations for adjacent hotel pool facilities. The facilities themselves would not be within the 40-foot shoreline setback area. Grading is also required for the landscape improvements described below.

The applicant proposes to extend landscaping from the development site into the 40-foot shoreline setback area to carry forth a continuous maintained garden setting to the beach and rock areas of the shoreline. Uncontrolled vegetative growth will be replaced with landscaping, including grass and introduced plants, to provide a visual transition between developed sites and the natural shoreline. Site preparation will include clearing, grubbing, grading and planting. Some existing trees will remain, but will be trimmed. An irrigation system which will be installed to maintain vegetative growth will be connected to the overall resort irrigation system.

Portions of the existing six-foot public beach access nature trail, which goes from Kaunaoa Bay to Hapuna Bay, will be improved. The walkway will be paved and steps added where improvements are needed and warranted for safety reasons. Also proposed for

certain portions of the trail are overhead trellises. To enhance night-time safety, unobtrusive low-level, non-glare lighting is planned along the pedestrian walkway, as required.

An intermittent shoreline wall above the certified shoreline will be installed for landscaping and public safety purposes.

Ancillary features are proposed to facilitate maintenance of the shoreline area and enhance its use. These include lookout and pedestrian seating areas with benches, lawn furniture, planters, rubbish receptacles, and informational/directional signs. In addition to these improvements, shoreline work will include removal of existing barbecues and old building slabs in the shoreline area.

The necessary approvals required for Mauna Kea Properties' proposal are as follows:

- Special Management Area Permit
- Shoreline Setback Variance Permit

## II. DESCRIPTION OF THE AFFECTED ENVIRONMENT

### Physical Setting

The South Kohala Resort site is located in the Kawaihae area of the Big Island, one of Hawaii's driest localities receiving less than 10 inches of rainfall annually. The site slopes gently to the sea from an elevation of about 600 feet at the mauka boundary. The shoreline portion of the project site consists of arid, gently sloping areas with low, rugged lava sea cliffs interspersed by occasional sandy beaches and bays. Areas that do not appear to be rocky are actually areas with a thin veneer of beach sand overlying rocks. Part of the shoreline area overlooks a portion of Hapuna Beach.

The project site is in general unused. The shoreline area is currently in its natural state and is unused except by pedestrians on the public access nature trail which extends from boundary to boundary. Signs are interspersed along the public trail, guiding walkers along the trail system.

As classified by the USGS Soil Conservation Service and the University of Hawaii Land Study Bureau, soils at the project site are not suited for agricultural use.

The coastal area is subject to tsunami inundation. The potential flooding from a 100-year tsunami could reach 100 feet inland in some areas. The projected base flood elevation is 8 feet above sea level.

Drainage at the South Kohala Resort site is through six major, fairly well defined mauka/makai drainageways that carry runoff to the shoreline.

Runoff is expected to increase temporarily during construction and as a result of the installation of impermeable surfaces such as roads and parking lots at the resort. However, with the installation of the golf course and extensive landscaping, the proposed use of dry wells and sedimentation basins, substantial runoff will be taken care of at the individual development sites before reaching the shoreline area. No significant adverse drainage impacts are expected.

### Flora/Fauna

Four types of vegetation cover types characterize the project site: open scrub grassland, kiawe woodland, coastal strand, and disturbed/landscaped areas. No listed or proposed endangered or

threatened plant species were found at the project site during a March 1984 survey by Earthwatch.

The 40-foot shoreline setback area is characterized by strand vegetation associated with beaches and rocky cliffs. Trees, shrubs and vines grow in the sand substrate. These include hau, naupaka-kahakai, and tree heliotrope, as well as the beach morning glory and the beach dropseed. All are indigenous species except for the exotic tree heliotrope. Other native species--nohu, pa'u-o-hi'i-'aka, 'ilima, and nena--are found along the cliffs and rocky shoreline. Also present are exotic grasses and forbs such as swollen fingergrass and Australian salt bush.

The native plants on the shore-side of the trail are in some areas still abundant and/or vigorous.

Increased use of the shoreline areas will lead to the possible trampling of native plant assemblages. The paved shoreline trail keeping pedestrians away from sensitive plants and instructive signs along the pathway will tend to mitigate potential adverse effects.

Biologist Philip Bruner conducted an ornithological and feral mammal field survey of the proposed South Kohala Resort development lands in February 1984. A wide assemblage of species, mostly exotic, was observed. No endangered species of birds or mammals were observed.

Included in the survey was the shoreline area which provides excellent habitat for a number of bird species due to the large trees along the coastline. Pacific Golden Plover, Wandering Tattler, and Ruddy Turnstone were observed along the rocky

shoreline. The exposed shelf at low tide serves as an important foraging site for these species of birds.

The use of the shoreline by Ruddy Turnstone and Wandering Tattler, and to a lesser degree Golden Plover, could be adversely affected if development markedly alters the shoreline or exposes it to substantial increase in human use. Improved pedestrian shoreline access will lead to increased human use. As a mitigation measure, signage will be used to encourage pedestrians to keep to the pathways, thus minimizing intrusion into the exposed rocky shelf that serves as coastal foraging grounds for birds.

#### Marine Environment

Rather than the typical solid reef platform with high coral cover which is characteristic of the waters of the region, the nearshore area of the project site consists of a sandy expanse with minimal coral cover. Due to the lack of reef structure, the turbidity of the water, and the paucity of organisms, the offshore waters would not seem to be favorable for many marine activities such as fishing, snorkling, and scuba diving.

There is existing stress to organisms associated with large natural sediment loads in the water and therefore there is little potential for adverse impact on the marine environment as a result of the project, given reasonable care is taken during construction and operations.

The nearshore waters off the coast of the proposed South Kohala Resort are classified by the State Department of Health as Class AA. It is the objective of this classification to maintain the natural pristine state as nearly as possible with an absolute

minimum of pollution or alteration of water quality from any human-caused source or action. Compatible recreation and aesthetic enjoyment, among others, are the principal uses to be protected in this marine environment. Precautions will be taken during construction and afterwards to minimize adverse effects on the nearshore waters.

#### Historic/Archaeological Resources

The entire development area of the South Kohala Resort has undergone considerable archaeological investigation, leading to the completion of a number of studies on the mauka and makai lands. The resulting reports are adequate as informational requirements for various land use permit applications.

In 1983, Paul H. Rosendahl, Ph.D., Inc. (PHRI) performed intensive survey and test excavations in the makai lands. Three sites appear to be within or very close to the 40-foot shoreline setback area, all near the central shoreline portion of the Bluffs site: two walled shelters, an eroding midden deposit, and a cliff complex. Two other sites further north along the coast of the Bluffs site are near the 40-foot shoreline setback area: a stone cairn and a walled enclosure that has been excavated.

In 1985, PHRI conducted an archaeological survey of TMK 6-6-02:37, which includes the shoreline setback area slated for improvement. The resultant report recommended minimal intensive survey recording and testing of two sites: T-104 (Feature A), a walled shelter with central wall, and T-120, an oval collapsed enclosure. These sites are not within the shoreline setback area; they are located more than 400 feet inland.

The proposed development will not have an adverse effect on the archaeological and historical sites. The archaeological sites uncovered have all been recorded and those recommended for excavation have been excavated. Selected archaeological sites beyond the 40-foot shoreline setback area near The Bluffs will be preserved and integrated into the landscaping.

#### Viewplane

The construction of the hotel, residential units, and recreational amenities will result in a change in the visual character of the moderately sloping development site, but the low density of planned development and the presence of the golf course will allow the resort to retain an open feeling. Landscaping which will replace arid scrubland, will improve views across the project lands. Mauka residential units will be spaced among the golf course to minimize adverse visual impact.

The 40-foot shoreline setback area will be visible from the Bluffs condominiums, the beach club, the hotel and tennis club. Since no substantial structures are proposed for the area, views of the shoreline will in general be little affected. The panoramic view of the shoreline will be altered somewhat by the proposed improvements such as the shoreline walls and overhead trillises. The increased vegetation will tend to improve seaward views. The applicant proposes lighting that will be designed so as not to adversely affect night-time views; low-level, indirect lighting will be used.

Distant views of the shoreline from resort development further

mauka will be different from existing views due to the proposed development.

Mauka views from the shoreline are expected to be somewhat affected; no substantial structures are proposed for the shoreline area and the improvements that are planned would have only some visual impact. As in the case of seaward views, mauka views will tend to be improved by planned landscaping.

Pedestrians in the 40-foot shoreline setback area and persons on Hapuna Beach looking mauka will see the hotel and condominium units. The Bluffs condominiums will be two-storied, low-rise and clustered buildings, designed to maintain open viewplanes. Hotel units will be clusters of two to six terraced stories. Views of these buildings will be softened by the extensive use of landscaping throughout the grounds, particularly surrounding the structures and on the hotel roofs.

#### Infrastructure

Access to the proposed resort will be from one access point on Queen Kaahumanu Highway. The entry road will go makai to the hotel and The Bluffs; it will also go to the mauka lands by way of an underpass (under the highway). Pedestrian public access will be available along the shoreline via a described easement.

All necessary utilities, including water, sewer, telephone, and electricity, will be provided to the site.

#### Socioeconomic Considerations

Development of the resort will result in increased direct, secondary and tertiary regional employment both during construction and operations of the resort facilities. Increased regional

employment will also result in an increase in regional population, which in turn will generate a demand for additional housing on the island. While it is anticipated that the private housing market will have the capacity to satisfy some of this demand, it is also anticipated that some assisted housing will be necessary. Mauna Kea Properties, Inc. will work with the County to determine a mutually satisfactory means of providing additional housing units for the region.

In addition to the beneficial effect of new job generation, secondary beneficial effects will occur in the island and state economy. Income earned by resort employees will generate increased consumer spending, increased retail sales and new jobs in the retail, wholesale, and service sectors. Further, operation of the hotel and other resort facilities will result in increased orders for suppliers and distributors of goods and services, both on the island and in the state.

State and county revenues, including sales and income taxes, and property taxes, will increase as a result of the proposed resort development.

In the short-term, the construction industry will benefit from the mobilization of labor, and suppliers and distributors of construction materials will benefit from the increased construction activity over a period of a number of years.

There will be a need for public services as a result of resort development: police and fire protection, medical facilities, schools and libraries, and recreational facilities.

The improved shoreline trail and the installation of amenities such as lookout and seating areas are expected to increase pedestrian use of the shoreline by the public, resort residents and visitors. A positive social impact is the increased accessibility to and safety of the shoreline for the public, resort residents and visitors.

### III. SUMMARY OF POTENTIAL IMPACTS

Development of the resort amenities will involve grading, vegetation removal, building improvements, new landscaping and infrastructure improvements. Improvements to the shoreline area will involve removal of existing amenities and building remains, site grading, vegetation removal, new landscaping, and the construction of improvements. The potential exists for significant effects to occur, involving the following:

- o Transformation of the terrain and shoreline area due to grading, importation/exportation of soil and landscaping;
- o Change in the visual character of the natural physical environment to landscaped areas with improvements;
- o Airborne dust and noise during the construction period;
- o Changes in species composition of flora and fauna;
- o Improved public access to and along the shoreline;
- o Increased use of public utilities and services;
- o Increased short-term and long-term employment;
- o Increased personal income and business activity;
- o Increased demand for housing; and
- o Increased government revenues and expenditures.

### IV. ALTERNATIVES TO THE PROPOSED ACTION

#### No Action

One alternative to the proposed action is to do nothing. This "no action" alternative would result in no shoreline improvements, no resort facilities, and no landscaping. There would be no impacts, positive or negative, on the site.

#### Resort Development Without Shoreline Improvements

Mauna Kea Properties has obtained most of the necessary planning permits to proceed with development of the proposed South Kohala Resort. However, permits have not been obtained for the proposed shoreline setback area improvements. Without these improvements, public access, safety and enjoyment of the shoreline area would not be enhanced.

### V. MITIGATING MEASURES

Construction of the proposed resort facilities, including shoreline setback area improvements, will generate impacts on the environment, such as noise, dust and possibly some soil erosion. The effects are expected to be temporary in nature, lasting only as long as each project's construction period. As an added precaution, mitigating measures are planned to reduce or lessen these impacts through the use of stringent construction practices and environmental control devices on construction equipment.

As mentioned previously, it is believed that the private housing market is capable of satisfying some of the housing demand generated by the proposed resort development, but some assisted housing will be necessary. Mauna Kea Properties, Inc. will work



with the County to determine a mutually satisfactory means of providing additional housing units for the region.

#### Recreation

Hapuna Beach, a portion of which fronts the project site, is used by residents and visitors. The improved shoreline and the resort with which it is associated, are expected to increase public use of the shoreline and beach area, but it would not overburden the sand area, as resort guests and residents will have a number of recreational options within the resort premises to choose from, including a beach club with pool deck, wet bar and lounge area. Guests and residents will also have access to the resort's golf course, tennis club and historic preserves.

#### Historical/Archaeological

The lands within the proposed South Kohala Resort site have undergone extensive archaeological investigation. Resulting studies for the makai and mauka area are adequate as informational requirements for various land use permit applications.

Intensive survey and test excavations have been performed, as recommended by Paul H. Rosendahl, Ph.D., Inc., on designated archaeological sites. Selected archaeological sites beyond the 40-foot shoreline setback area will be preserved and integrated into the landscaping.

#### Scenic and Open Space

The low density character of planned development and the golf course which will extend both mauka and makai of Queen Kaahumanu Highway, will ensure the preservation of an open space character at the resort. Scenic views will improve with the introduction of the

golf fairways and other landscaping, in particular public views from Queen Kaahumanu Highway. The use of building clusters, terracing, and extensive landscaping, in the project sites closest to the shoreline area, will soften public views from the beach and shoreline area.

The intermittent improvements in the shoreline area will ensure preservation of open space in most of the area. Those improvements proposed will be such so as not to obstruct distant views from Queen Kaahumanu Highway.

#### Coastal Ecosystems

The proposed improvements will not significantly damage valuable coastal ecosystems. Surface runoff will be minimized by landscaping and drainage systems. The proposed project will comply with all Federal and State Department of Health water quality regulations.

#### Economic

The proposed improvements will be part of a resort to be developed by a private interest on a site which is considered suitable for resort development. The resort is dependent upon its location near the shoreline for a viable operation.

The proposed uses at South Kohala Resort are permissible uses under State and County land use regulations. The proposed resort is not expected to generate significant adverse social impacts in a region that is characterized as significantly visitor-oriented.

The proposed resort and shoreline improvements will not preclude the use and enjoyment of beaches and coastal areas by the

general public. The proposed shoreline improvements will enhance public access.

South Kohala Resort will contribute to the visitor industry, which is a vital element of the State's and County's economy. Moreover, it will create new jobs and generate substantial income in the State and County.

#### Coastal Hazard

The proposed development will not alter any drainage patterns that would adversely affect adjacent development or downstream properties. A portion of the project site is located in a coastal high hazard flood zone. No habitable floor areas will be developed in elevations affected by a 100-year tsunami inundation.

#### VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Development of the property for resort use will commit the land to long-term uses associated with the proposed project. Private funds, labor, construction equipment, building materials, landscape materials, energy sources, water resources and other utility service will be committed to the development of the project. Additionally, future employees will be required. Public and private funds for service utilities and facilities and advertising resources for promotions will be required.

#### VII. AGENCY CONSULTED

Planning Department, County of Hawaii

#### VIII. DETERMINATION

In conformance with Subsection 11-200-12 of the State Environmental Impact Statement Regulations (Significance Criteria), the Planning Department of the County of Hawaii has determined that

an environmental impact statement will be prepared in accordance with Chapter 343, Hawaii Revised Statutes.

The proposed development has the potential to have significant impacts on the environment because of the effects that may result from improvements in the 40-foot shoreline setback area.

IX. AGENCIES TO BE CONSULTED IN EIS PREPARATION

Federal Agencies

U.S. Army Corps of Engineers, Pacific Ocean Division  
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service  
U.S. Dept. of the Interior, Fish and Wildlife Service  
U.S. Dept. of the Interior, Geological Survey, Water Resources Div.  
U.S. Environmental Protection Agency, Region IX-San Francisco

State Agencies

Department of Accounting and General Services  
Department of Agriculture  
Department of Budget and Finance  
Department of Defense  
Department of Education  
Department of Hawaiian Home Lands  
Department of Health  
Department of Labor and Industrial Relations  
Department of Land and Natural Resources  
Department of Planning and Economic Development  
Department of Social Services and Housing  
Department of Taxation  
Office of Environmental Quality Control  
Office of the Governor  
Office of Hawaiian Affairs

University of Hawaii

U.H. Environmental Center  
U.H. Water Resources Research Center

Congressional Representatives

The Honorable Daniel K. Inouye  
The Honorable Spark M. Matsunaga  
The Honorable Daniel K. Akaka  
The Honorable Patricia Saiki

State Legislators

Senator Richard Henderson  
Senator Richard M. Matsura  
Senator Malama Solomon  
Representative Virginia Isbell  
Representative Andrew Levin  
Representative Robert Lindsey  
Representative Wayne M. Metcalf, III  
Representative Harvey S. Tajiri  
Representative Dwight Takamine

Hawaii County

Mayor Dante K. Carpenter  
Department of Public Works  
Department of Parks and Recreation  
Department of Water Supply  
Department of Research and Development  
Fire Department  
Office of Housing and Community Development  
Safety Coordinator  
Civil Defense Agency  
Finance Department  
Hawaii Redevelopment Agency  
Planning Department  
Police Department

Hawaii County Council

James L. K. Dahlberg  
Frank De Luz, III  
Takashi Domingo  
Robert Herkes  
Lorraine Jitchaku-Inouye  
Russell Kokubun  
Merle K. Lai  
Spencer Kalani Schutte  
Stephen K. Yamashiro

Public Utilities

Hawaii Electric Light Company  
Hawaiian Telephone  
Gasco Inc., Hawaii Division

Community Organizations and Other Public Interest Groups

BIBC, Big Island Business Council  
Hawaii Filipino Council  
Hawaii Hotel Association  
Hawaii Leeward Planning Conference  
Kohala Businessmen's Association  
Kohala Coast Resort Association  
Kohala Community Association  
Kona Conservation Group  
Kona/Kohala Chamber of Commerce  
Life of the Land, Hawaii Chapter  
Moku Loa Group, Hawaii Chapter  
Na Ala Hele  
Puako Community Association  
Save Hapuna Initiative Petitioners Committee  
South Kohala Resort Advisory Committee  
Waimea Hawaiian Civic Club

Waimea-Kawaihae Community Association  
 West Hawaii Board of Realtors  
 West Hawaii Committee

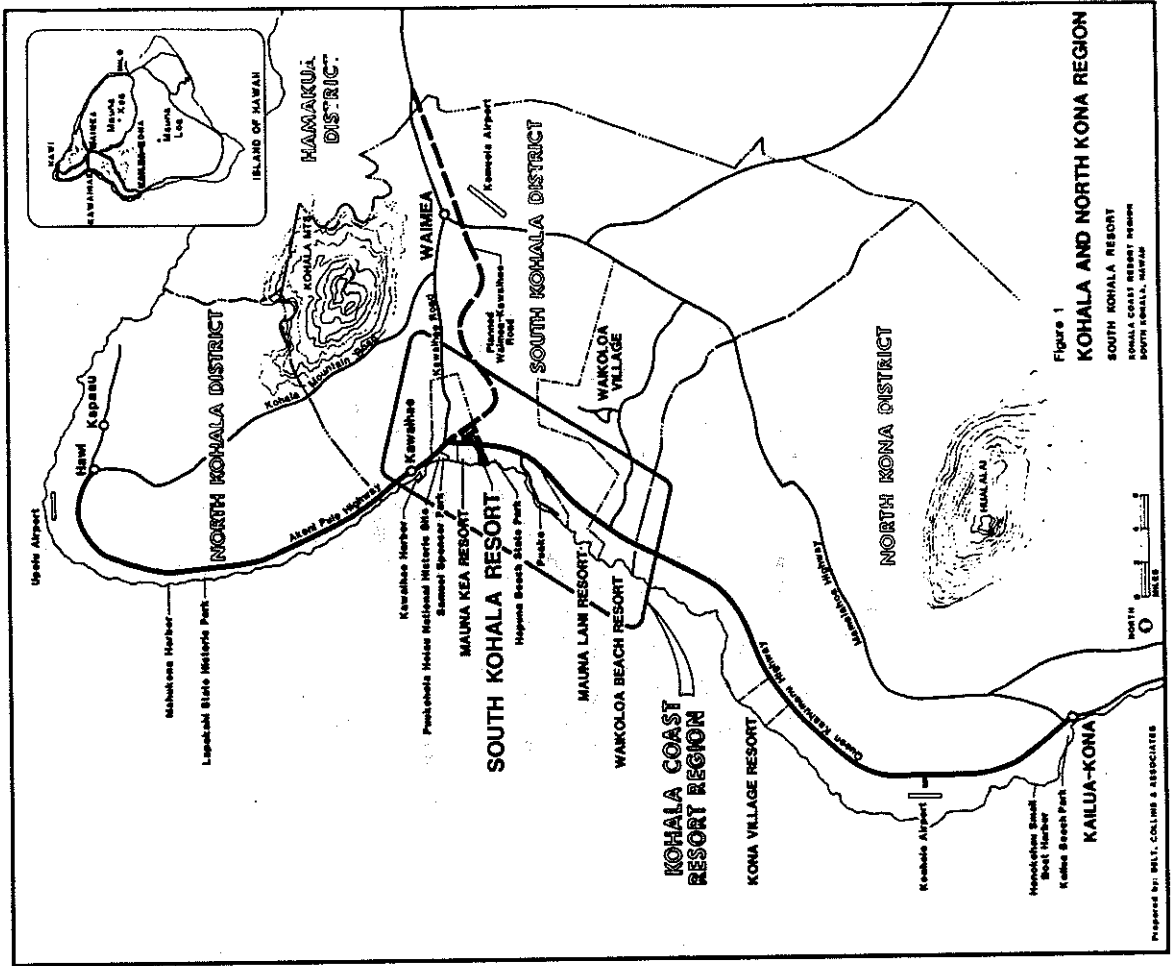
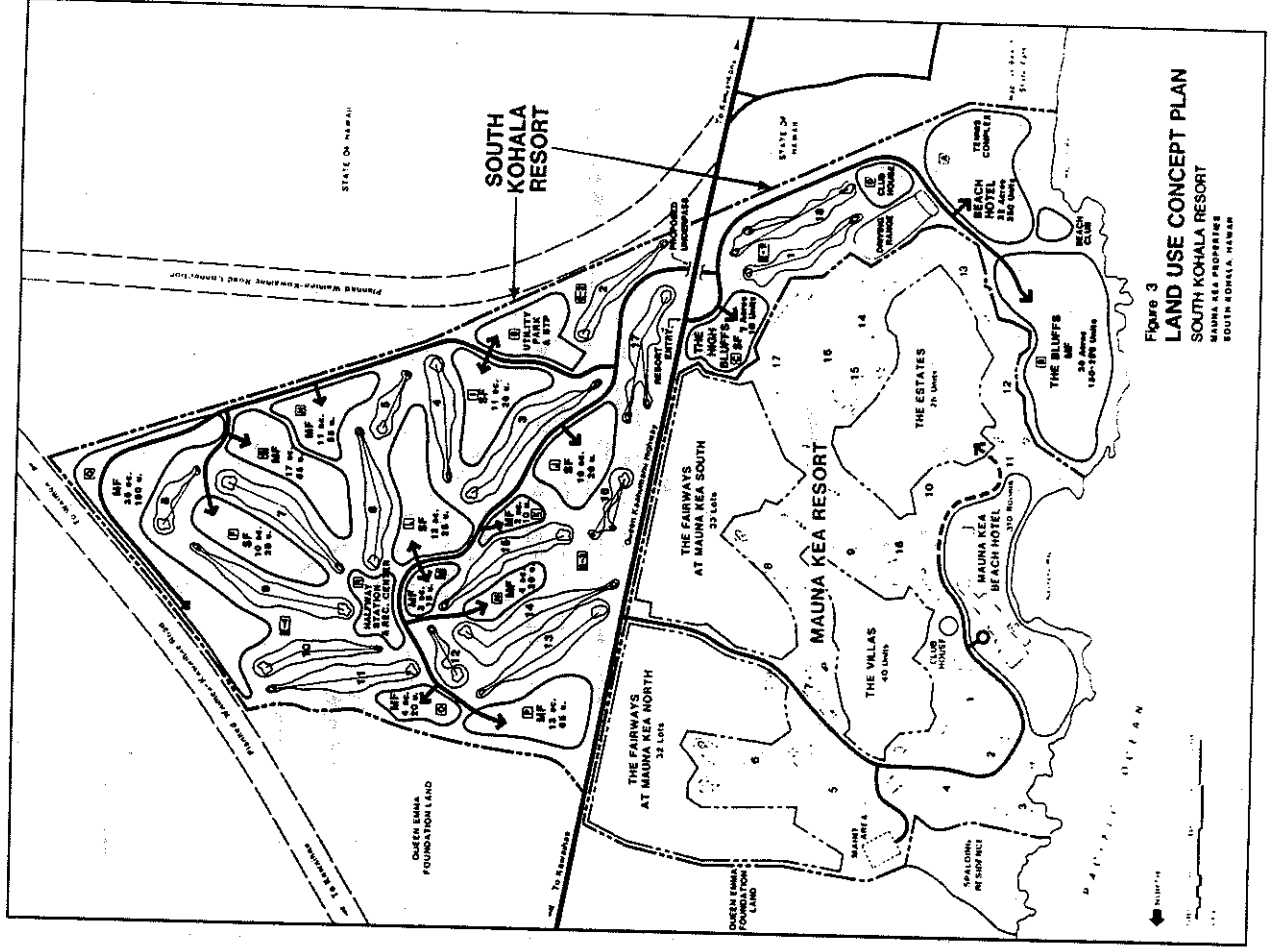
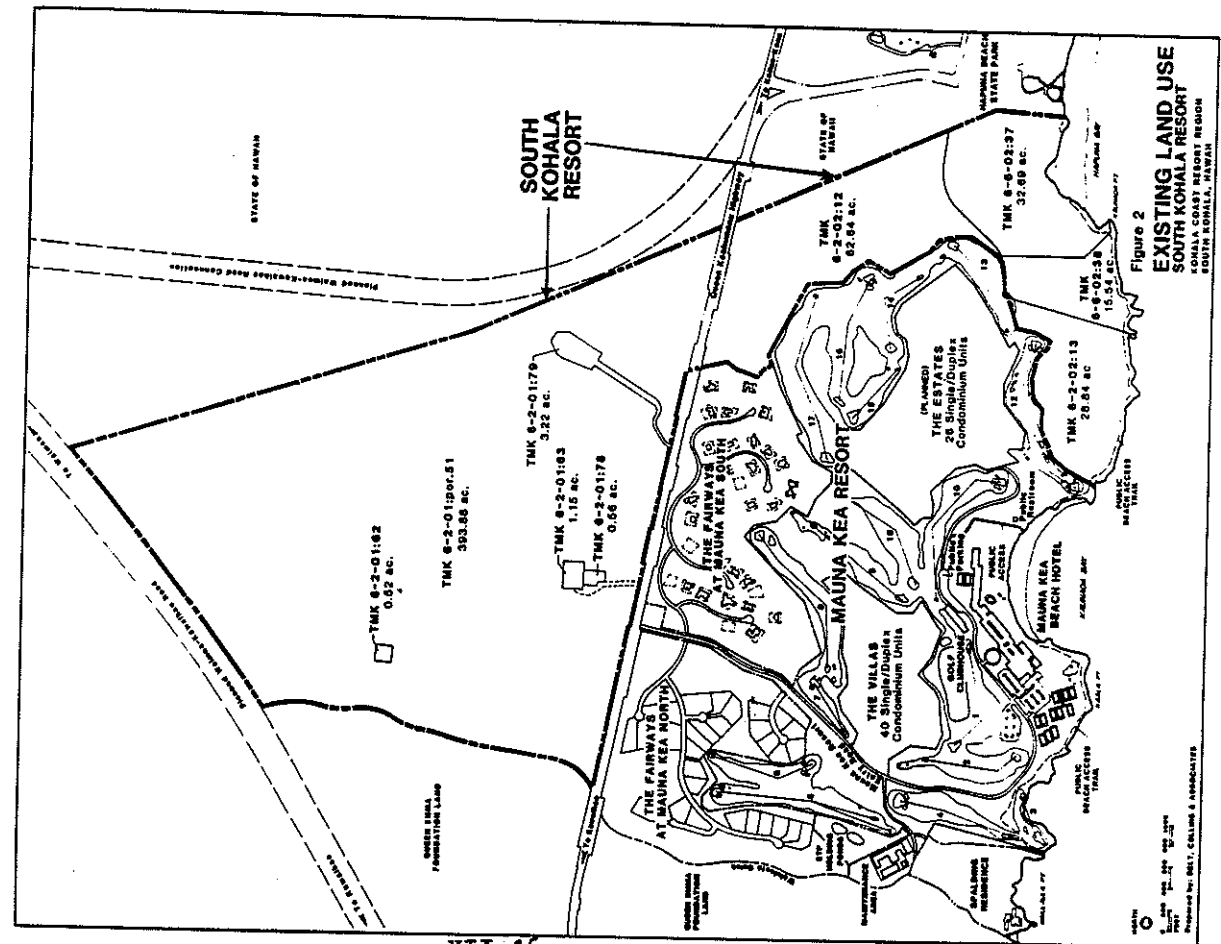


Figure 1  
**KOHALA AND NORTH KONA REGION**  
 SOUTH KOHALA RESORT  
 KOHALA COAST RESORT REGION  
 NORTH KONA DISTRICT

Prepared by: M.L.T. COLLINS & ASSOCIATES



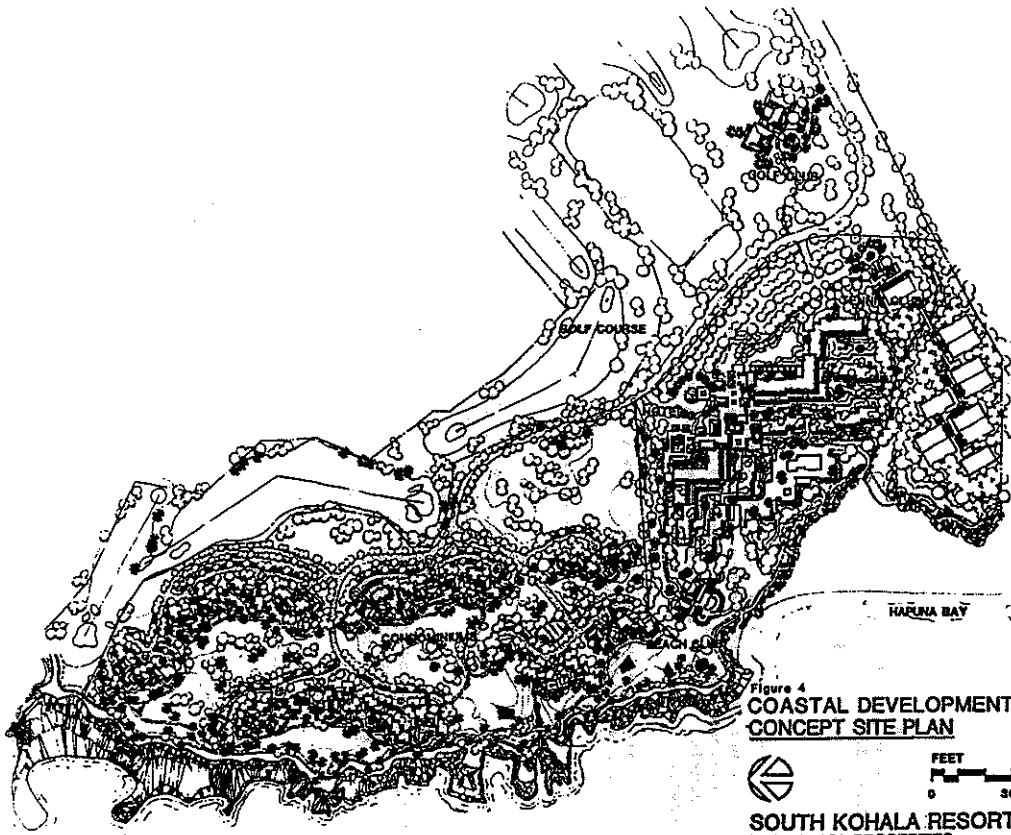
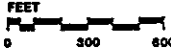


Figure 4  
**COASTAL DEVELOPMENT  
 CONCEPT SITE PLAN**



**SOUTH KOHALA RESORT  
 MAUNA KEA PROPERTIES**

WIMBERLY  
 WISEMAN  
 ALLISON  
 TONG  
 & GAO  
**WAT&G**  
 Architects, Ltd.



United States Department of the Interior  
GEOLOGICAL SURVEY  
Water Resources Division  
P.O. Box 50166  
Honolulu, Hawaii 96850

December 16, 1986  
86-2247

January 13, 1987

Dear \_\_\_\_\_:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-07;12 & 13, 6-6-02;37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

On November 24, 1986, Mauna Kea Properties submitted a Special Management Area Use permit petition and a Shoreline Setback Variance application to the County of Hawaii Planning Department for the proposed project. The Planning Department determined that, due to the Shoreline Setback Variance request, the applicant shall prepare an Environmental Impact Statement (EIS) in accordance with Chapter 343, Hawaii Revised Statutes (HRS). An EIS Preparation Notice announcing this determination was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. A copy of the EISPN and the environmental assessment is enclosed.

We request that you or your organization assist us in preparing the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special knowledge, or interest. You could help us address those issues that are of greatest concern by indicating in writing the specific questions, issues, and topics you believe are important and the reasons why they are.

The EIS Regulations stipulate that upon publication of a preparation notice, agencies, groups or individuals have a period of 30 days to make written comments regarding the environmental effects of the proposed project. We hope you will be able to respond within this time period. If all goes as planned, the EIS will be available in April 1987. At that time, the document will be circulated for public review and comment.

Thank you for your cooperation. Should you have any questions, please call me at 521-5361.

Sincerely,

Anne L. Mapes

ALM:lf  
Enclosure

Ms. Ann L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

The Hawaii District Office of the U.S. Geological Survey, Water Resources Division, has reviewed the Environment Assessment and Notice of Preparation of an Environmental Impact Statement for the proposed South Kohala Resort, South Kohala, Hawaii. We have no comments to make regarding this statement.

We appreciate the opportunity to review the Environmental Assessment and Notice of Preparation - EIS.

Sincerely,

Charles J. Ewart  
Acting District Chief

Copy to: Albert Lono Lyman, Director  
Planning Department  
County of Hawaii

**BELT COLLINS  
& ASSOCIATES**

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7410474 • Fax (808) 538-7819

Hawaii • Singapore • Australia • Cebu • Manila • Hong Kong • Japan

**JOHN MATHEE**  
REGISTERED ARCHITECT  
GOVERNOR



**STATE OF HAWAII**  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
DIVISION OF PUBLIC WORKS  
P. O. BOX 119, HONOLULU, HAWAII 96810

STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
DIVISION OF PUBLIC WORKS

June 5, 1987  
87-1212

LETTER NO (P) 2156.6

Mr. Charles J. Ewart  
Acting District Chief  
Geological Survey  
Water Resources Division  
U.S. Department of the Interior  
P.O. Box 50166  
Honolulu, Hawaii 96850

Dear Mr. Ewart:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 13, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you had no comments concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

Sincerely,

Anne L. Mapes

AL:mf

cc: Mr. William F. Melecke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Subject: EIS Preparation Notice  
Proposed South Kohala Resort, Hawaii

We have reviewed the subject document and have no comments to offer.

Very truly yours,

TEUANE TOMINAGA  
State Public Works Engineer

/jnt  
cc: Mr. Albert Lono Lyman

DEC 30 1987



BELT COLLINS  
& ASSOCIATES

Planning  
Architecture

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JOHN WATHER  
COMMISSION



RECEIVED  
JAN 14 1987

ALEXIS - LHM  
MAJOR GENERAL  
ADJUTANT GENERAL

STATE OF HAWAII  
OFFICE OF THE ADJUTANT GENERAL  
3849 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96818-4495

STATE OF HAWAII

DEPARTMENT OF DEFENSE  
OFFICE OF THE ADJUTANT GENERAL

3849 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96818-4495

June 5, 1987  
87-1196

Mr. Teuane N. Tominaga  
Dept. of Accounting & General Services  
Division of Public Works  
State of Hawaii  
P.O. Box 119  
Honolulu, Hawaii 96810

Dear Mr. Tominaga:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of December 30, 1986 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you had no comments concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

ALM:hif

cc: Mr. William F. Mielcke, Mauna Keo Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

HIENG

JAN 08 1987

Ms. Anne L. Mapes  
Belt Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received the proposed Preparation Notice - Environmental Impact Statement for the Proposed South Kohala Resort and have no comments.

Thank you for providing us the opportunity to review the document.

Yours truly,

Jerry V. Matsuda  
Major, Hawaii Air  
National Guard  
Contr & Engr Officer

cc: Mr. Albert L. Lyman, Director  
Planning Dept/County of Hawaii

Sincerely,

Anne L. Mapes

**BELT COLLINS  
& ASSOCIATES**

Engineering - Planning  
Landscape Architecture

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June 5, 1987  
87-1209

Major Jerry M. Matsuda  
Department of Defense  
Office of the Adjutant General  
State of Hawaii  
3949 Diamond Head Road  
Honolulu, Hawaii 96816-4495

Dear Mr. Matsuda:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 8, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you had no comments concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEGC) within the next two months. The OEGC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:M:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

JOHN WAHIEE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF TAXATION

P.O. BOX 259  
HONOLULU, HAWAII 96809

March 11, 1987

Ms. Anne L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

Re: Environmental Impact Statement Preparation Notice Proposed  
South Kohala Resort, South Kohala, Hawaii

This is in response to your request for our comments in preparing an environmental impact statement on the proposed South Kohala Resort in Hawaii. We have no comments to make on the proposed project.

Thank you for allowing us the opportunity to review your proposal to develop a resort community in the South Kohala area.

Very truly yours,

*Lawrence J. Nakano*

LAWRENCE J. NAKANO  
Income Technical Officer

LJN-MAD:jls

**BELT COLLINS  
& ASSOCIATES**

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June 5, 1987  
87-1219

Mr. Lawrence J. Nakano  
Income Technical Officer  
Department of Taxation  
State of Hawaii  
P.O. Box 259  
Honolulu, Hawaii 96809

Dear Mr. Nakano:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of March 11, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you had no comments concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:M:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



TRUSTEES

Moses K. Keale, Sr.  
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Trustee from Kauai & Niihau

Louis Hio  
Vice Chairperson  
Trustee from Molokai & Lanai

Maanakele Akaka  
Trustee from Hawaii

Rod Kealimanihi Burgeess  
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Clarence F.T. Ching  
Trustee from Oahu

A. Frenchy DeSoto  
Trustee-at-Large

Manu Kanahele  
Trustee from Maui

Thomas K. Keulokui, Sr.  
Trustee-at-Large

Kevin M. K. "Chubby" Mahoe  
Trustee-at-Large

ADMINISTRATOR  
Kanaki A. Kanahele III

February 4, 1987

Ms. Anne L. Mapes  
Belt, Collins, & Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

The Office of Hawaiian Affairs reserves comment on the project at this time.

We look forward to examining the Draft Environmental Impact Statement. Thank you for the opportunity to comment.

Sincerely,

*Kanaki A. Kanahele III*  
Kanaki A. Kanahele, III  
Administrator

KAK:IP:im

1600 Kapiolani Blvd., Suite 1500  
Honolulu, Hawaii 96814  
(808) 946-20HA

**BELT COLLINS  
& ASSOCIATES**  
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June 5, 1987  
87-1218

Mr. Kamaki A. Kanahahele, III  
Administrator  
Office of Hawaiian Affairs  
1600 Kapiolani Blvd., Suite 1500  
Honolulu, Hawaii 96814

Dear Mr. Kanahahele:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of February 4, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you have no comments at this time concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months and will send you a copy for your review.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lif

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



**DEPARTMENT OF THE ARMY**  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
BUILDING 230  
FT. SHAFTER, HAWAII 96888 -5440

January 9, 1987

REPLY TO  
ATTENTION OF:

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Thank you for the opportunity to review and comment on the EIS Preparation Notice for the Proposed South Kohala Resort, South Kohala, Hawaii. The following comments are offered:

- a. A Department of the Army permit is not required.
- b. The shoreline portions (TMK 6-2-02:13, 37 and 38) are within the Coastal High Hazard areas as defined by the Flood Insurance Rate Map prepared by the Federal Insurance Administration for the County of Hawaii. Care should be exercised in development within this area. The exact limits of the hazard area have not been defined. It is recommended that the applicant conduct detailed analysis for structures to be situated within high hazard areas.

Sincerely,

*Kisuk Cheung*  
Kisuk Cheung  
Chief, Engineering Division

Enclosures

**RECEIVED**  
JAN 12 1987

BELT, COLLINS & ASSOCIATES



January 14, 1987 F/SWRI:JJUN

June 5, 1987

87-1211

Ann L. Mapes  
Belt, Collins, and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Mr. Kisuk Cheung, Chief  
Engineering Division  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Building 230  
Fort Shafter, Hawaii 96858-5440

Dear Mr. Cheung:

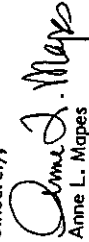
XII-1-87

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 9, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. The information you provided will be helpful in preparing the EIS, which will address your concerns about building within high hazard areas.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

  
Anne L. Mapes

ALM:lif

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Ann L. Mapes  
Belt, Collins, and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Der Ms. Mapes:

Subject: Environmental Impact Statement (EIS) Preparation Notice, Proposed South Kohala Resort, South Kohala, Hawaii.

The National Marine Fisheries Service (NMFS) has received the subject draft EIS Preparation Notice for the proposed South Kohala Resort, South Kohala, Island of Hawaii. We understand the developer, Mauna Kea Properties, Inc., is preparing the EIS as part of the County of Hawaii, Shoreline Setback Variance. The following comments are offered for your consideration in preparing the Draft EIS.

NMFS is greatly concerned with the recent ongoing and proposed development occurring along the Kona and Kohala coastlines of the Island of Hawaii. We feel the cumulative effects of these activities may have serious adverse impacts on the unique anchialine/tidal pond and nearshore coral reef habitats for which this region is noted. Consequently, we concur with the preparation of an EIS for the proposed development.

NMFS is pleased to note that the developer proposes to provide shoreline open space along the entire property shoreline with public access to be incorporated into the resort site development. However, the EIS Preparation Notice does not indicate whether work is proposed on the beaches below the high-water line or in the immediate coastal waters. Any activity in this area would be of concern to NMFS and should be detailed in the Draft EIS.

In addition to the above, we feel the following items should be addressed in the project EIS:

1. Existing use of coastal waters off the proposed resort by subsistence, commercial and recreational fishing interests, including opihi and limu gatherers, divers and dive charter operators.
2. Baseline information on the conditions of the reef immediately offshore from the project area; i.e. live coral coverage and species diversity, reef fish and macro-invertebrate abundance.



RECEIVED  
JAN 15 1987  
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June 5, 1987  
87-1214

Mr. Doyle E. Gates, Administrator  
U.S. Department of Commerce  
National Marine Fisheries Service  
Southwest Region  
Western Pacific Program Office  
2570 Dale Street  
Honolulu, Hawaii 96822-2396

Dear Mr. Gates:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

NMFS strongly suggests that the developer prepare a "Resource Management" or "Environmental Protection Plan" to assure protection of aquatic and terrestrial species and their habitats in the proposed project area.

We appreciate the opportunity to comment on the proposed South Kohala Resort project at this early pre-EIS stage. Should you require additional information please contact Mr. John Naughton of my staff. We look forward to receiving a copy of the Draft EIS as soon as it becomes available.

Sincerely yours,

*Doyle E. Gates*

Doyle E. Gates  
Administrator

cc: F/SWR, Terminal Is., CA  
F/M4, Washington, D.C.  
Corps of Engineers, Honolulu  
EWS, Honolulu  
EPA, Region 9 (P-5)  
Hawaii State Div. of  
Aquatic Resources  
County of Hawaii,  
(Mr. Lono Lyman)

Thank you for your letter of January 14, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the materials. Your concerns have been noted and will be addressed in the EIS.

A baseline assessment of the marine environment in the vicinity of the proposed resort was performed by Steven Dollar in 1984 in conjunction with a petition for State land use change. Dr. Dollar has recently resurveyed the offshore area and is preparing a study based on this survey, taking into consideration concerns expressed by various individuals and agencies. The results will be reported in the EIS. Also completed is an assessment of potential impacts due to the use of fertilizers and pesticides on the resort grounds. Findings from this study will be included in the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

*Anne L. Mapes*

Anne L. Mapes

ALM:lf

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



# University of Hawaii at Manoa

Water Resources Research Center  
Holmes Hall 283 • 2540 Dole Street  
Honolulu, Hawaii 96822

15 January 1987

Ms. Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

**SUBJECT:** Environmental Impact Statement Preparation Notice,  
Proposed South Kohala Resort, South Kohala, Hawaii,  
December 1986

We have reviewed the subject EISPN and have no comment at this time. Thank you for the opportunity to comment. This material was reviewed by WRRRC personnel.

Sincerely,

*Edwin T. Murabayashi*

Edwin T. Murabayashi  
EIS Coordinator

ETM:jm

# BELT COLLINS & ASSOCIATES

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone: (808) 521-5361 • Telex: BELTH 7429274 • Fax: (808) 536-7779  
Hawaii • Singapore • Australia • California • Hong Kong • New York

June 5, 1987  
87-1215

Mr. Edwin T. Murabayashi  
EIS Coordinator  
University of Hawaii at Manoa  
Water Resources Research Center  
Holmes Hall 283  
2540 Dole Street  
Honolulu, Hawaii 96822

Dear Mr. Murabayashi:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 15, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you had no comments concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

Sincerely,

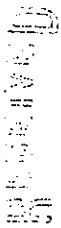
*Anne L. Mapes*

Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

JOHN WAIHEE  
GOVERNOR



JAN 14 1987

SUZANNE D. PETERSON  
CHAIRPERSON, BOARD OF AGRICULTURE



TADASHI TOMO  
DEPUTY TO THE CHAIRPERSON

State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 So. King Street  
Honolulu, Hawaii 96814-2512

Mailing Address:  
P. O. Box 22159  
Honolulu, Hawaii 96822-0159

January 13, 1987

Ms Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Subject: Environmental Impact Statement Preparation  
Notice (EISP/N)  
Proposed South Kohala Resort  
Mauna Kea Properties, Inc.  
TMK: 6-2-02: 12 & 13  
6-6-02: 37 & 38  
Acres: 540

The Department of Agriculture has reviewed the subject EIS Preparation Notice and has the following comments to offer.

According to the EISP/N, the applicant seeks to develop a self-contained resort community. The water requirements are to be met by a series of existing wells on State lands north of the property. According to our analysis, the agricultural productivity of the area is relatively poor based on the Agricultural Lands of Importance to the State of Hawaii (ALISH) System, Soil Conservation Service Soil Survey and the Land Study Bureau Overall Productivity Ratings. Rainfall is less than 10 inches per year.

It appears that the approval and development of the proposed resort will not adversely impact the agricultural resources of the area.

Thank you for the opportunity to comment.

Sincerely,

SUZANNE D. PETERSON  
Chairperson, Board of Agriculture

cc: A. Lono Lyman  
OEQC

BELT COLLINS  
& ASSOCIATES

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June 5, 1987  
97-1213

Ms. Suzanne D. Peterson, Chairperson  
Board of Agriculture  
State of Hawaii  
1428 South King Street  
Honolulu, Hawaii 96814-2512

Dear Ms. Peterson:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 13, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. The information you provided will be helpful in preparing the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

Anne L. Mapes

ALM:lf

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



John Waihee  
GOVERNOR OF HAWAII

PROJECT OFFICES  
WAIHEA OFFICE  
P. O. BOX 125  
KAMUELA, HAWAII 96743

KEAUOKAHA OFFICE  
P. O. BOX 833  
HILO, HAWAII 96720

RECEIVED  
JAN 12 1987  
STATE OF HAWAII  
DEPARTMENT OF LAND & NATURAL RESOURCES



STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS

P. O. BOX 1879  
HONOLULU, HAWAII 96805

January 9, 1987

PROJECT OFFICES

MAUI OFFICE  
P. O. BOX 22  
KAMULUI, MAUI 96732

MOLOKAI OFFICE  
P. O. BOX 196  
MOOLEHUA, MOLOKAI 96720

MAUI OFFICE  
P. O. BOX 332  
LUNUE, MAUI 96766

Ms. Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Thank you for your letter of December 16, 1986 with its attached Environmental Impact Statement (EIS) Preparation Notice for the proposed resort at Ouli, South Kohala, Island of Hawaii.

While this development is not expected to have a direct impact on neighboring Hawaiian Home Lands at Kawaihae and Waimea, there are a few items which we believe should be addressed.. These include:

- 1) The Old Hawaiian Coastal Trail or "King's Highway"  
The developer has not indicated how it will treat this trail. It has a distinct and real history in Hawaiian legends and Hawaiian history. Any encroachments on the trail should be identified in the EIS.
- 2) Potential Burial Sites  
While archaeological surveys have been done in the area, there is always the chance that burial sites will be found. The developer should be prepared for such and have a plan for treating discovered grave sites. This should be indicated in the EIS.
- 3) Water Development  
Water is a precious resource in the area. More details should be provided in the EIS on how and where water will be obtained.

Ms. Anne L. Mapes  
Page Two  
January 9, 1987

4) Road Development

The maps with the Preparation Notice indicate a realigned Waimea-Kawaihae Road. Sources of information with a projected timeframe for road development should be noted in the EIS.

These are a few of the Department of Hawaiian Home Lands' concerns. However, at the same time, we realize the need for increased employment opportunities in the area. We hope that the developer will make every effort to hire local people from the surrounding communities in career-oriented positions.

Thank you for the opportunity to comment. We look forward to reviewing this project's EIS. Should you have any questions, please call Robert Fletcher of our Planning Office at 548-8785.

Sincerely,

*Ilima A. Pijanaia*

Ilima A. Pijanaia, Chairman  
Hawaiian Homes Commission

IAP:RF:HS:eh

**BELT COLLINS  
& ASSOCIATES**  
Engineering - Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5261 • Telex BELTH 7430474 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colorado • California • Hong Kong • Japan

Ms. Ilima A. Pionaiia, Chairman  
Hawaiian Homes Commission  
Department of Hawaiian Home Lands  
State of Hawaii  
P.O. Box 1879  
Honolulu, Hawaii 96805

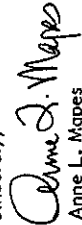
Dear Ms. Pionaiia:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 9, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the material. Your concerns regarding archaeological sites, water supply, and roadway systems will be addressed in the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

  
Anne L. Mapes

ALM:jf

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

John Waihee  
GOVERNOR OF HAWAII



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

January 16, 1987

Ms. Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Subject: Environmental Impact Statement Preparation Notice for the South Kohala Resort, S. Kohala, Hawaii

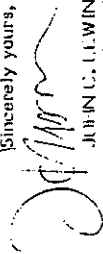
Thank you for allowing us to review and comment on the subject EIS preparation notice. The following are our comments.

The EIS should include the potential impact on the ambient air quality, as a result of increased vehicular activity from the proposed project and all other projects which were previously approved but have not started construction. Projections on the increased traffic volume and the impact on the ambient air quality should be for the associated corridors, roadways and highways. The results should be compared to the State and Federal ambient air quality standards. Should a potential violation be determined, the EIS should address the mitigating actions which shall be implemented.

Municipal drinking water and wastewater treatment systems or their equivalents are recommended as the most appropriate alternatives because of the magnitude of the proposed project. The projected concern is the maintenance of the water quality of the receiving waters.

Fugitive dust and solid waste disposal during grubbing and grading activities need to meet the requirements of Administrative Rules, Title 11, Chapter 60, Air Pollution Control and Chapter 58, Solid Waste Management Control. The incorporation of a dust and erosion control plan in the construction plans is recommended.

Sincerely yours,

  
JOHN C. LEWIN, M.D.  
Director of Health

cc: Mr. Albert Lono Lyman  
Honolulu, Hawaii

John C. Lewin, M.D.  
DIRECTOR OF HEALTH  
STATE OF HAWAII

IN REPLY, PLEASE REFER TO  
EPHSD

**BEIT COLLINS  
& ASSOCIATES**

Engineering - Planning  
Landscape Architecture

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**RECEIVED**

JAN 7 1987

BEIT, COLLINS, & ASSOCIATES  
DIRECTOR



John Wathes  
Governor

**STATE OF HAWAII  
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS**

800 PURCHOWEL STREET  
HONOLULU, HAWAII 96813

January 2, 1987

Dr. John C. Lewin, M.D.  
Director of Health  
Department of Health  
State of Hawaii  
P.O. Box 3378  
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 16, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the materials.

The Draft EIS will address the concerns raised in your letter pertaining to air quality, drinking water, and wastewater treatment. Traffic and air quality studies have been performed for the proposed project and the results will be included in the EIS document.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Ms. Anne L. Mapes  
Beit, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

This is in response to your letter of December 16, 1986, regarding the Environmental Impact Statement Preparation Notice for the Proposed South Kohala Resort.

We feel that a project as large as the South Kohala Resort will require a substantial number of workers during the construction period as well as the operational period. Although Hawaii County has had the highest unemployment rate in the state for the past 12 years, you may want to address the availability of the labor supply necessary to fill the jobs that will be created. The Kona-Kohala area (census tracts 213-219) has an unemployment rate about 2.0 percentage points lower than East Hawaii. The growing importance of the resort industry in West Hawaii has also resulted in a number of resort developments in this area, and several other major development projects have been proposed. A shortage of workers in certain occupational areas may result if all proposals are approved. The department will be happy to assist in recruiting job applicants to fill any openings through our various employment and training agencies.

Thank you for providing us the opportunity to review the environmental impact statement preparation notice. If there are any questions regarding this matter, please call Mr. Frederick Pang, Chief of our Research and Statistics Office at 548-7639.

Sincerely,

Mervin R. Ramili  
Director

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June 5, 1987  
87-1205

Mr. Mario R. Ramil, Director  
Department of Labor & Industrial Relations  
State of Hawaii  
830 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Mr. Ramil:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 2, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. A comprehensive socioeconomic impact analysis has been prepared for the EIS which addresses the subject of labor supply raised in your letter. Your suggestion for recruitment assistance through your department's employment and training agencies is appreciated and has been passed on to the applicant, Mauna Kea Properties, Inc.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



## DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

KAMAHAU BUILDING, 250 SOUTH KING ST, HONOLULU, HAWAII  
MAILING ADDRESS: PO BOX 2508 HONOLULU, HAWAII 96813-0258

Ref. No. P-5690

John Waijies  
Roger A. Ulveland  
MURRAY E. RYAN  
BRAD SMITH

NAME AND ADDRESS OF DEVELOPER  
PROJECT NAME  
PROJECT LOCATION  
DATE RECEIVED  
PLANNING DIVISION  
RESEARCH AND ECONOMIC ANALYSIS DIVISION  
ADMINISTRATIVE SERVICES DIVISION  
INFORMATION OFFICE

January 7, 1987

**RECEIVED**

JAN 8 1987

BELT COLLINS & ASSOCIATES

Ms. Anne L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Subject: EISPN for Oceanfront Resort at Ouli 1, South Kohala,  
County of Hawaii (Mauna Kea Properties, Inc.)

We have reviewed the subject environmental impact statement preparation notice (EISPN) and have the following comments.

There appears to be an inconsistency in the EISPN regarding the intended scope of the project. The tax map key designations for the subject project listed on page 1 of the EISPN indicate that four parcels totaling 139.71 acres are within the subject project parameters. However, page 2 of the EISPN states, "The project site is both mauka and makai of Queen Kaahumanu Highway, spanning about 540 acres, of which about 140 acres makai of the highway are in the Shoreline Management Area." The draft environmental impact statement (DEIS) should clarify the boundaries of the project area.

Page 3 of the EISPN states that the "Construction cost of the South Kohala Resort, including facilities and infrastructure, is expected to amount to over \$3,000,000." Based on information provided by the petitioner for Land Use Commission (LUC) consideration during the reclassification of the subject property, this amount appears to be substantially below the original estimate of \$298,000,000.

The DEIS should identify the State Land Use District classifications for the subject properties. The only reference to this concern in the EISPN is on page 16, which states, "The proposed uses at South Kohala Resort are permissible uses under State and County land use regulations." This statement is an interpretation on the part of the petitioner and requires some clarification.

The DEIS should address the project's development schedule as it relates to the LUC's incremental approval for reclassification of the project area. According to the LUC, Phase I, encompassing approximately 31 acres, has been reclassified to the Urban District. Upon compliance with the conditions imposed by the Commission, Phase II encompassing the remaining 82.35 acres will be reclassified. Until such time, Phase II remains in the Agricultural District.

Ms. Anne L. Mapes  
Page 2  
January 7, 1987

The other condition imposed by the LUC involves the establishment of provisions to expand housing opportunities for low and moderate income residents. Page 12 of the subject document indicates that "some assisted housing will be necessary" in the private housing market to meet the increased demand for housing created by this project. The EIS should elaborate on how the developer intends to meet this condition. The EISPN contains one general statement that "Mauna Kea Properties, Inc. will work with the County to determine a mutually satisfactory means of providing additional housing units for the region." Further details are desirable to assess compliance with the conditions set forth by the LUC's Decision and Order, Mauna Kea Properties Inc., May 6, 1985.

For your information, the conditions are reproduced below.

The "incremental restricting of the Property shall be subject to the condition that Petitioner shall provide housing opportunities for low and moderate income Hawaii County residents and employees by constructing and offering for sale or lease, on a preferential basis on its own or in cooperation with either or both the Hawaii Housing Authority and the County of Hawaii, ten percent (10%) of the residential units to be developed on Phases I and II on the Property, at prices determined by standards promulgated by the Hawaii Housing Authority and County of Hawaii from time to time, or by contributing to the development of such housing outside of the Property."

"IT IS ALSO HEREBY ORDERED that lands within Phase II of Petitioner's development .... is hereby approved for incremental development pursuant to the State Land Use District Regulation 6-2, and that restricting from the Agricultural to the Urban classification be granted upon a showing of substantial progress and completion of Phase I and development of Petitioner's Hapuna Beach Resort Hotel."

The proposed resort development is adjacent to Hapuna Beach State Park. The EIS should thoroughly address the potential impacts of the resort to the visual and aural character of the area.

Hawaii Coastal Zone Management (CZM) policy calls for the provision of adequate, accessible, and diverse recreational opportunities in the coastal zone management area by protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas. Since Hapuna Beach is one of the only white sand beaches in Hawaii County that is easily accessible for public recreational use, the EIS should discuss the potential impacts on such use that might result from development of the proposed project. A description of the number and location of public accessways and associated facilities, such as comfort stations and parking spaces, should be provided. Also, the issue of continued public access to historic sites in the project area should be discussed.

Ms. Anne L. Mapes  
Page 3  
January 7, 1987

CZM policy provides for the promotion of water quantity and quality planning and management practices which reflect the tolerance of freshwater and marine ecosystems. The impact of water withdrawal for the South Kohala Resort and other projects along the North Kona/South Kohala coast should be evaluated in terms of possible cumulative effects on the salinity of the aquifers in the area. Impacts of such salinity changes on water users and on the biota in the project area should also be discussed.

We are concerned that biocide use in the proposed resort may result in harmful effects on biota in the project area. The permeability of the underlying rock strata makes the underlying water table especially susceptible to such application. A listing of the types and quantities of pesticides and herbicides to be used on the proposed project should be provided. An analysis of the potential impacts of these use patterns on water quality and on biota in the nearshore and shoreline environments should also be done.

The DEIS should discuss the relationship of the proposed project to the Hawaii State Plan (Chapter 226, HRS). This review should at a minimum discuss the relationship of the proposed project to the following: Economy (Section 226-8, HRS), Physical Environment (Sections 226-11 thru 226-13, HRS), Facility Systems (Sections 226-15 and 226-16, HRS) and Socio-cultural Advancement (Sections 226-19, 226-20, 226-23 and 226-25, HRS). Among the relevant Priority Guidelines, the following should be examined: Economic (Section 226-103(b) and (c), HRS), Population Growth and Land Resources (Section 226-104), HRS) and Affordable Housing (Section 226-106, HRS). The State Functional Plans should be reviewed to determine relevance to your project and important relationships should be discussed in the DEIS.

Thank you for the opportunity to comment on the subject document.

Sincerely,

*M. A. Ulveling*  
Roger A. Ulveling

cc: Hon. Albert Lono Lyman,  
Planning Dept., County of Hawaii  
Office of Environmental Quality Control

BELT COLLINS  
& ASSOCIATES  
Engineering • Planning  
• Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELITH 7430474 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Japan  
July 21, 1987  
87-1508

Mr. Roger A. Ulveling, Director  
Department of Planning and Economic Development  
State of Hawaii  
P.O. Box 2359  
Honolulu, Hawaii 96804

Dear Mr. Ulveling:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of January 7, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the materials. Your concerns, in their order of appearance in your letter, are addressed as follows.

**Scope of Project** The scope of the South Kohala Resort project and the scope of permit applications will be clarified in the EIS.

**Construction Cost** Due to a typographical error, the resort construction cost was mistakenly listed as \$3,000,000 on page 3 of the EISPN. The amount should be \$300,000,000.

**State Land Use District Classifications** The conditions for the Land Use Commission's incremental approval for reclassification of the mauka lands will be discussed in the EIS.

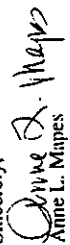
**Hapuna Beach State Park** The EIS will thoroughly address potential impacts to Hapuna Beach State Park, particularly use of the sandy beach area adjacent to the proposed development. Public access provided by the applicant to the shoreline area and historic sites will be described.

**Water Quality and Chemical Use** A study of potential impacts due to herbicide and fertilizer use on the resort grounds has been prepared for the EIS and the results will be presented in the EIS document.

**Hawaii State Plan and State Functional Plans** The EIS will discuss the relationship of the proposed project to those sections of the Hawaii State Plan listed in your letter, to the State Functional Plans, as well as to other relevant governmental plans and policies.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mieleke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lynnan, Hawaii County Planning Department



John D. Waihee  
GOVERNOR

STATE OF HAWAII  
DEPARTMENT OF SOCIAL SERVICES AND HOUSING  
HAWAII HOUSING AUTHORITY

P. O. BOX 17807  
HONOLULU, HAWAII 96817

January 7, 1987

87:PLNG/82

TO:

IN REPLY REFER

RUSSELL N. FUKUNOTO  
EXECUTIVE DIRECTOR

Ms. Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

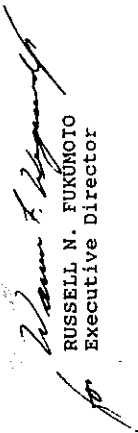
**Re: Environmental Impact Statement Preparation  
Notice (EISPN) for the Proposed South Kohala  
Resort, South Kohala, Hawaii**

The Hawaii Housing Authority has reviewed the EISPN and has the following comments.

1. How will the proposed project conform to the State Housing Functional Plan and its objectives, in particular, the provision of affordable housing opportunities.
2. The draft EIS should include a description of the planned residential projects. For example, sales price and/or rental ranges for the various units, a breakdown of the types of dwelling units that will be offered at these prices and rent levels, and the targeted income groups.

Thank you for the opportunity to offer our comments. Should you have any questions, please contact Colette Sakoda of my staff at 848-3226.

Sincerely,

  
RUSSELL N. FUKUNOTO  
Executive Director

**BEIT COLLINS  
& ASSOCIATES**

Engineering - Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTIN 7430274 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colombia • Hong Kong • Japan



Phone: 935-6011  
935-0012

**HAWAII COUNTY CIVIL DEFENSE AGENCY**

344 Rainbow Drive  
HILO, HAWAII 96720

**RECEIVED**

JAN 8 1987

BEIT COLLINS & ASSOCIATES

January 6, 1987

Anne L. Mapes  
Beit, Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

PROPOSED SOUTH KOHALA RESORT, SOUTH KOHALA, HAWAII

Thank you for the opportunity to review the Mauna Kea Properties, Inc. proposal at such an early stage of development.

As the proposal indicates, a portion of the project is located in a coastal high-hazard Flood zone. As you are probably aware, planning should take into account not only the 100-year tsunami inundation factor but the hazards of hurricanes and high surf caused by passing storms.

Numerous problems that can affect the safety and comfort of employees and guests, plus cost factors, can be prevented if some basic planning is done on the landscaping and especially the location and type of recreational and beach structures.

An emergency-response plan will be requested from your development upon completion. The plan will entail the warning, evacuation, and securement procedures of the project during civil defense-declared emergencies.

Please contact me directly if I can be of any help for this project. Wishing you the best.

*Harry Kim*

HARRY KIM, ADMINISTRATOR

dy

June 5, 1987  
87-1208

Mr. Russell N. Fukumoto  
Executive Director  
Hawaii Housing Authority  
Dept. of Social Services & Housing  
P.O. Box 17907  
Honolulu, Hawaii 96817

Dear Mr. Fukumoto:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 7, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate your comments and will take them into consideration in preparing the EIS.

Specifically, the EIS will contain a discussion of the proposed project as it relates to the State Housing Functional Plan. Also, the Draft EIS will contain a description of the planned residential projects. A market analysis prepared for the proposed resort development projects the demand for residential units by number and price range. This demand helps define the market for the planned residential units as will be described in the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEGC) within the next two months. The OEGC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

*Anne L. Mapes*

Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

BELT COLLINS  
& ASSOCIATES

Engineering - Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELITH 7430074 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colombia • Hong Kong • Japan

June 5, 1987  
87-1207

Mr. Harry Kim, Administrator  
Civil Defense Agency  
County of Hawaii  
34-A Rainbow Drive  
Hilo, Hawaii 96720

Dear Mr. Kim:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 6, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate your comments and the Draft EIS will address the concerns raised in your letter. An emergency-response plan will be submitted to your department at the appropriate time.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

cc: Mr. William F. Mielicke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

DEPARTMENT OF PUBLIC WORKS  
COUNTY OF HAWAII  
HILO, HAWAII

DATE

January 6, 1987

*Memorandum*

TO : Planning Department

FROM : Chief Engineer

SUBJECT: MAUNA KEA PROPERTIES, INC. - EIS/PN  
TRK: 6-2-2:12 & 13; 6-6-2:37 & 38

We have reviewed the subject document and we have the following comments:

Provide a channelized intersection at Queen Kaahumanu Highway. This shall consist of a left turn pocket protected by a painted island and also an auxiliary lane for right turn. The purpose of the left turn pocket is to provide a clear path for through traffic while the auxiliary lane is to provide an opportunity to decrease speed upon entering the resort.

The makai portion of the site is in the flood hazard area. A map of proposed structures in this area with the tsunami inundation zone superimposed should be shown in the draft EIS.

Roadways shall be kept in private ownership.

Provide a vehicular connection between the two hotels so that the Highway need not be used for interior circulation.

The portions of this property along Waiulaula Gulch is in Zone A. The floodway and fringe portions of this flood hazard area should be determined for the MF areas O & P.

Developer shall be responsible for a solid waste transportation system to the Kona landfill.

*[Signature]*  
HUGH Y. ONO  
Chief Engineer  
DHM:aa

cc: Waste Management  
Engineering Division



**BELT COLLINS  
& ASSOCIATES**

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July 22, 1987  
87-1507

Mr. Hugh Y. Ono, Chief Engineer  
Department of Public Works  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Ono:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

This is in response to your memo of January 6, 1987 to the County of Hawaii Planning Department concerning your review of the EIS preparation notice for South Kohala Resort. A copy of your letter was forwarded to Belt Collins.

Mauna Kea Properties will provide a channelized intersection at Queen Kaahumanu Highway and the resort entry road. Planning, design and construction of the intersection will be coordinated with the State Department of Transportation.

A map of the makai portion of the site with the proposed concept plan and the tsunami inundation zone superimposed will be shown in the EIS. The flood hazard area will be determined.

The developer of South Kohala Resort will contract with a private company to dispose of solid waste.

Regarding your comment on the provision of a vehicular connection between the Westin Mauna Kea and the new hotel at South Kohala Resort, please note that the concept calls for two separate and distinct resort destinations: Mauna Kea Resort and South Kohala Resort. Each will be autonomous and operated separately and apart from one another; each will be self supporting. Hence, no direct vehicular connection between the two resorts is planned. As indicated in your memo, South Kohala Resort's roadways will be kept in private ownership.

After you have had an opportunity to review the foregoing information, we would appreciate any further comments you may have.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII  
25 AUPUNI STREET • HILO HAWAII 96721

January 2, 1987

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

**ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE  
MAUNA KEA PROPERTIES, INC.  
RESORT DEVELOPMENT  
TAX MAP KEY 6-2-02:12 AND 13  
6-6-02:37 AND 38**

Through participation in the construction of the Lalani Water System, the applicant was allotted 1.0 million gallons per day (mgd) of water. Based on actual unit water consumption by the Mauna Kea Fairways North and the Villas at Mauna Kea, the projected anticipated maximum daily water demand for the proposed additional resort development exceeds the allotment of 1.0 mgd. The developer must pursue additional source development to meet the required water demands.

*William F. Mielcke*  
H. William Sewake  
Manager

QA

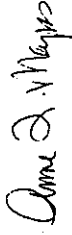
cc - Mauna Kea Properties, Inc.  
Planning Department

Mr. H. William Sewake  
July 22, 1987 - page 2

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will be sent a copy for further comment.

July 22, 1987  
87-1509

Sincerely,

  
Anne L. Mapes

Mr. H. William Sewake, Manager  
Department of Water Supply  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Sewake:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 2, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the materials. Your concerns regarding water availability and use will be addressed in the EIS.

As stated in your letter of June 15, 1987 to Mr. William Mielcke of Mauna Kea Properties, based on the consumption pattern in the existing Villas at Mauna Kea and the Fairways at Mauna Kea North, current projected usage is 0.55 million gallons of water per day (mgd). Mauna Kea Properties has a total allotment of 1.0 mgd and thus has a balance of 0.45 mgd for additional development.

We agree that use at the Villas at Mauna Kea and the Fairways at Mauna Kea North is higher than normal and than the original estimates. However, potable water usage at the proposed South Kohala Resort is expected to be less than at Mauna Kea Resort, due to differences in facilities at the two resorts and such measures as the use of brackish water for irrigation at South Kohala Resort.

Should the 0.45 mgd remaining Lalamilo allotment be insufficient for the needs of the entire South Kohala Resort development, Mauna Kea Properties states that, at the appropriate time, it would seek new sources of potable water. As needed, it would fulfill its water requirements by drilling more wells on its lands at the 1,200-foot elevation or by participating in future expansion of the Lalamilo water system or other available source.

We understand that the availability of water for South Kohala Resort and water allotments for individual resort projects are the subject of ongoing discussions between your department and Mauna Kea Properties and its representatives. Information from these discussions will be used in the water impact analysis in the EIS.

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

**BELT COLLINS  
& ASSOCIATES**

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Landscape Architecture

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June 5, 1987  
87-1200

Mr. Francis E. Smith, Fire Chief  
Fire Department  
County of Hawaii  
466 Kinooale Street  
Hilo, Hawaii 96720

Dear Mr. Smith:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of December 23, 1986 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the material. The Draft EIS will address the concerns raised in your letter relating to water supply and fire equipment and systems.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to make further comment.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

FRANCIS E. SMITH  
FIRE CHIEF

DON COLOMA  
DEPUTY FIRE CHIEF



**HAWAII COUNTY FIRE DEPARTMENT**

466 KINOOLE STREET  
HILO, HAWAII 96720  
PHONE 935-2378

December 23, 1986

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Subject: Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have no objections to the proposed development at South Kohala Resort. Developer shall provide adequate water supply and distribution system as required by AIA formulas and relative County Water Department regulations. Provide fire apparatus access to all structures within the development.

Automatic fire sprinkler systems are recommended for all commercial and residential structures within the complex.

Thank you for giving us the opportunity to submit our comments.

Sincerely,

*Francis E. Smith*  
FRANCIS E. SMITH  
FIRE CHIEF

FES/mo

SPARK M. MATSUNAGA  
HAWAII

WASHINGTON OFFICE  
1000 KAPIOLANI BUILDING  
WASHINGTON, D. C. 20510

HONOLULU OFFICE  
7104 PRINCE KUHIO BLVD  
HONOLULU, HAWAII 96850

# United States Senate

WASHINGTON, D.C. 20510

December 22, 1986

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Anne:

Re: Environmental Impact Statement  
This is just to acknowledge receipt of  
your recent communication addressed to  
Senator Spark Matsunaga.

Please be assured that the Senator  
will be responding to you at the earliest  
possible moment.

Yours truly,

*Cheryl Matano*  
Cheryl Matano (Ms.)  
Administrative Assistant  
to Senator Matsunaga

CHIEF DEPUTY  
DEMOCRATIC WHIP

MEMBER

COMMITTEE ON FINANCE

COMMITTEE ON ENERGY AND  
NATURAL RESOURCES

COMMITTEE ON LABOR AND  
HUMAN RESOURCES

COMMITTEE ON  
VETERANS' AFFAIRS

RECEIVED  
JAN 9 1987

BELT, COLLINS & ASSOCIATES

BELT COLLINS  
& ASSOCIATES

Engineering • Planning  
Landscape Architecture

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Hawaii • Singapore • Australia • Colorado • Hong Kong

June 5, 1987  
87-1194

The Honorable Spark M. Matsunaga  
3104 Prince Kuhio Building  
300 Ala Moana Boulevard  
Honolulu, Hawaii 96850

Dear Senator Matsunaga:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for the letter of December 22, 1986 from your staff regarding the EIS  
Preparation Notice and Environmental Assessment for the above project. Although  
you had no comments concerning the project, we appreciate the time you and your  
staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality  
Control (OEQC) within the next two months. The OEQC Bulletin will announce the  
availability of the Draft EIS for review, should you want to comment on the project at  
that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

DANIEL K. AKAKA  
SECOND DISTRICT, HAWAII

COMMITTEE  
APPROPRIATIONS  
SUBCOMMITTEE  
AGRICULTURE  
RURAL DEVELOPMENT  
TREASURY  
POSTAL SERVICE  
TOURISM CAUCUS  
SPACE CAUCUS  
COCHAIRMAN

**Congress of the United States**  
**House of Representatives**

Washington, DC 20515

December 23, 1986

Ms. Ann L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes

Thank you for your request for comments on the potential environmental impact that the proposed South Kohala Resort will have.

At this time, my greatest concern in this area is the water supply. In the past, availability of adequate water has been a problem. Therefore, I urge you to pay particular attention to the short term and long term availability of this valuable resource.

Again, I appreciate your contacting me on this matter. Should you wish any further assistance, please do not hesitate to contact me again.

Aloha pumehana,

*Daniel K. Akaka*  
DANIEL K. AKAKA  
Member of Congress

WASHINGTON OFFICE  
2301 RAYBURN HOUSE OFFICE  
BUILDING  
WASHINGTON, DC 20515  
TELEPHONE: (202) 225-4808  
DISTRICT OFFICE  
5104 PRINCE KUHIO KUNA  
KALANANOLUKE PETERSON BUILDING  
HONOLULU, HI 96850  
TELEPHONE: (808) 546-8882

RECEIVED

JAN 7 1987

DELT, COLLINS & ASSOCIATES

BELT COLLINS  
& ASSOCIATES  
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LANDSCAPE ARCHITECTURE

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June 5, 1987  
87-1701

The Honorable Daniel K. Akaka  
5104 Prince Kuhio Building  
P.O. Box 50144  
Honolulu, Hawaii 96850

Dear Representative Akaka:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of December 23, 1986 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the material. The Draft EIS will address your concerns related to the availability of adequate water supply both in the short term and in the long term.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to make further comment.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:HF

cc: Mr. William F. Mielcke, Mauna Keo Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



**HOUSE OF REPRESENTATIVES**

STATE OF HAWAII  
STATE CAPITOL  
HONOLULU, HAWAII 96813

December 22, 1986

Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Thank you for giving me the opportunity to respond to the Environmental Impact Statement Preparation Notice regarding the proposed South Kohala Resort.

At this time, I have no comments to make on the matter, but please keep me informed of any new developments.

With warm personal regards.

Sincerely,

WAYNE METCALF  
Hawaii State Representative  
Third District

**BELT COLLINS  
& ASSOCIATES**

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June 5, 1987  
87-1197

Representative Wayne M. Metcalf  
House of Representatives  
State of Hawaii  
State Capitol  
Honolulu, Hawaii 96813

Dear Representative Metcalf:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of December 22, 1986 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you had no comments concerning the project, we appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

Sincerely,

Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

BELT COLLINS  
& ASSOCIATES  
Engineering • Planning  
Landscape Architecture

606 Canal Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELHIL 719872 • Fax (808) 521-5362  
Hawaii • Singapore • Australia • California • Hong Kong

Dear Sir,

12/26/86

Please send any information available regarding the E. I. S. for the proposed South Kohala Hotel & Resort at Hapuna. I would like to participate in any dialogue that will be involved concerned this property.

Thank you very much,

Thomas N. Beach  
P.O. Box 69  
Kamuela, Hawaii 96743

Mr. Thomas N. Beach  
P. O. Box 69  
Kamuela, Hawaii 96743

Dear Mr. Beach:

Environmental Impact Statement for the  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of December 26, 1986 requesting to participate in any dialogue concerning the proposed resort. Early last week I sent you a copy of the environmental impact statement (EIS) preparation notice and assessment for the proposed project, asking for your comments to help us prepare the EIS. Most likely our correspondence has crossed in the mail and you have now received my request to identify those concerns you feel are most important.

Please call me at 521-5361 if you have not received the EIS preparation notice. I look forward to receiving your comments.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: William F. Mielcke

RECEIVED

JAN 7 1987

REIT, COLLINS & ASSOCIATES

Dear Sir,

This letter of concerns is hand written and not typed because I was unable to get time to type it. I am a worse typist than writer if you can believe that. And I do not have a secretary.

My fingers hurt writing it so you may have some trouble reading some words. I will make clear any questionable words or phrases upon request.

The ideas are what are important. Concepts and philosophy matter. Revisions I leave to someone better suited to it.

Tom Bush

+

1/5/87

Concerns and Reasons for Concerns:

1. Prohibit any fence, well, gate, barrier chain, cable, Vets, etc. within 40' setback or on own beach.  
To prevent domination of beach by individuals and territorial claim taking.

2. Allow no lighting in any direction within the setback area or beach.

To maintain the universal policies that now exist at Aspen. To allow beach area to see stars and moon unobscured by artificial lights.

3. Consider and implement a landscaping program at beach. All landscaping on beach shall be made visible.

To create beach area to enjoy the view of stars and moon and visibility to beach area.



1/5/87

4. Provide written standards and practices for permit conditions. Prohibit monitoring personnel to see polluter and other restrictions are added to.

To gain compliance rather than let the protest/resort slide into de facto abuse. Value to County and state. Charge fair. The beach and bay and public must be actively not passively protected.

5. Allow no signs visible from beach or setback other than location directions of facilities.

To prevent negative signs such as "keep out" or "no dogs" and other such to intrude on the free and open experience of the beach. It sets a bad frame of mind.

6. Permit lifeguard stand and equipment.

To encourage the hotel to provide lifeguard.

1/5/87

7. Permit no other equipment storage, building or object to be left upon beach or in setback at night or during day.

To prevent a "thing over for hotel use only" by the physical presence of Hotel Council and controlled equipment, buildings or objects. This is a problem already at other nearby hotels and can not be tolerated by or at the permit.

8. Allow no raft, floats, barriers in bay.

To prevent an extension of hotel territory over sections of the bay at the expense of public and to the hindrance of free and open swimming to users - practiced in bay.

1/5/87

9. Maintain a State or County organic spring-water analysis as to micro-organisms and chemical pollutants.

To have a basis of knowing whether springs are affected by events on the resort property. And if they are affected to stop that effect by relocation of permits until springs are back to their original state - not just water standards of state. That is not good enough. People drink that water now and will later. It must be maintained pure.

10. Provide a road from public road to beach through short.

To allow access in case of emergency at beach. It will be needed to save a life one day.

11. Provide for fire ladder track access to all sides of buildings over 3 stories.

1/5/87

11. To allow escape to victims that are trapped on elevated floors during a fire or other emergency.

12. Provide an emergency "direct connect" phone within 40' setback and level it clearly and in contrasting colors.

To allow immediate calls for help during emergencies such as a bearing while people wait.

13. Provide drinking water fountain to public.

Because people will have one. It gets dry on the beach.

14. Allow no unformed and/or small control of public on beach on a sign for any other trees.

To stop any inhibition of beach area

6  
1/5/87

by hotel guard patrol. If a guard is needed to control a situation that is illegal one can be called.

15. Provide fire hydrants every 250' of ground travel. Not to be obscured by any object.

To provide fire fighting operations to self lives and property.

16. Advise hotel guests not to remove scalps, artifacts, or other objects as souvenirs.

To prevent the destruction of the aquatic environment. To prevent archeological sites. To prevent rape of the area.

17. Any object placed on beach by hotel employees or guests must be in immediate view by employee or guest.

To prevent loss of personal umbrellas

7  
1/5/87

17. Tables, chairs, towel wagons, etc etc from being put on beach in anticipation of a possible need. This tends to make a territorial stake out by the hotel and excludes that land use by the general public.

Any objects placed on sand shall be in immediate use and removed immediately after we get to the general public shore.

18. No food or beverage shall be sold, prepared, or served, or left on the beach or in 40' setback area.

To prevent an open air restaurant like situation. If food went out or things may go to one of the other restaurants at the hotel for the day. Keeping their own "gast" as the public can

19. Allow no sale of bottled or canned beverages at hotel.

8  
1/5/87

19. This is to prevent the beach from being littered with bottles and cans.

20. If the hotel sells cigarettes then the hotel must collect butts in sand tossed there by guests.

It keeps the sand clean & fitful.

21. Allow no umbrellas, skyward, seaward or tennis-court lighting.

To maintain a natural setting not a circus atmosphere of "oh looky there".

22. Flora: Consider -

(A) Allow no mountain view from beach or bay to be obstructed by buildings, landscaping, or lights.

Reason: The enjoyment of same by the public and guests. A viewable ~~view~~ asset.

9  
1/5/87

(B) Allow no window glazing that reflects sun or artificial light toward sea or beach area.

To prevent a wall of glare toward the beach and bay. This would be very unpleasant.

(C) Prevent a complete landscape design for approval of public.

To prevent surprises of spacing or lack of screening trees.

(D) Determine that buildings shall be non-contrasting to natural settings.

Large white reflectance will not be pleasant with respect to the natural environment with a blending in to the natural setting be separable. Frank Lloyd Wright understood this. ~~It~~ should show hotel orientation.

10  
1/5/87

Q Allow no sodium or ugly bright unshaded ~~or~~ lights.

To prevent an ugly sea of lights to overhang the beach.

Q Allow <sup>NO</sup> building wall or landscape vegetation lighting.

To prevent escape of light to beach and setback area.

If walks and paths need lighting they should be lighted by a progression of small ground directed lights not large area lights to turn night into day.

Q All roofing to be non-glass.

To ~~the~~ prevent glare on beach.

Q No roof to be higher than screening landscaping - palms in particular as "light shade"

11  
1/5/87

Q A building sitting above all vegetation around it is a monolith that screams of man's conquest of the environment. The beach does not need that statement. It is to get away from such statements that people go to parks.

Q Allow no blinking lights.

They distract from the beauty of the night sky.

23. Hotel to provide alternate land route should access to beach area become hazardous or dangerous from state tower.

The winter rock point between the Little Beach and the northern public beach be not safe during winter surf. A land route is the only access for the general public. A trail should be provided for guests and public to be safe.

12  
1/5/87

24. Provide public access from public roadway through resort to public beach area with no more than 1/4 mile of a walk from car to beach.

To allow aged and very young access to north Japanese beach.

25. Times of beach access shall be the same for guests of hotel or public.

To prevent exclusive use of beach by guests by imposition of times of use restrictive on public ~~only~~ i.e. now done at Niwaka Nui, Puka Hotel at Niwaka Beach. If guests can go to beach or sitback areas then it should also be open to all at same times.

26. Prohibit all spraying of or use of herbicides, fertilizers, cleaning agents etc. etc. within beach or sitback area.

To prevent beach and bay pollution.

13  
1/5/87

26. To prevent human and sea animal damage or exposure.  
To prevent ground water pollution.

27. No swimming pool effluent shall be released into 40' setback area or beach area.

To prevent pollution.

28. Provide a ramp into sand from make area.

For emergency 4 wheel drive access.  
Handicap access.

29. Allow no landscape materials or plants to extend into beach sand area.

To prevent the erosion to form big dunes rather than sand. To prevent encroachment and shoreline deterioration to change.

14

1/5/87

30. Permit no sea wall, breakwater, dock, port, steps.

To prevent shoreline alterations that could change the setting from "natural" to improved amenities.

Also such changes could affect the shoreline and erosion or deposit.

31. Allow no classes to be given at the beach or in setback area.

Reason - To prevent takeover of public beach sections for private uses and the exclusion of public enjoyment or use.

Exception - Water safety classes.  
First Aid or C.P.P.  
These may be taught if public is invited.

32. Any replacement landscaping in the 40' setback must be of the same size and density as the present growth.

15

1/5/87

32. This is provide a visual screen between the hotel and the beach. This will continue the feeling of isolation and privacy that now exists on the beach. A unique experience.

33. All specimen sized trees and shrubs to be left on site except where actual buildings are to be located.

Removal of existing mature trees and shrubs will denude, and devastate the view from the beach and hotel. New-plant take years to mature.

An alternative is to replace one for one over a period of time in a graduated way.

34. Permit no motorized machine or truck or in 40' setback area.

No noise should be generated or heard from machinery or equipment on beach. There can a person robot with a high gear two cycle motor blowing in back of one.

16  
1/5/87

35. All machinery outside hotel building shall be noise proofed as heard from the beach. Air Conditioners, Pool equipment.

To prevent sound intrusion onto beach by hotel equipment

During construction phase no dust shall be permitted to escape to beach or 40' setback area.

Clouds of dust descending on the beach is not a pleasant experience. Any violation of this restriction should include a fine of money which will cause stoppage of the problem.

37. Allow no work on or night construction at site. Also no holiday work.

Public use will be harvest during week ends and holidays.

Night work will prevent sunrise equipment.

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1/5/87

38. Allow no construction procedure to alter or diminish the flow of the sea side or under sea springs of the area.

People use these springs to bath, drink and enjoy. Storage due to fishing or other procedures would be a great loss to beach goers and the sea life now there.

39. Allow no gas torches or other torches or lights in 40' setback or less area.

They smoke and they disrupt, the existing sunset experience. By installing that device offered.

40. Allow no portable maintenance and machinery in air above beach.

Boats, lawn mowers chain saws sprayers, carts, weed whackers, trimmers and the like are constantly generating noise at Mauna Kea Hotel. It is not



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a pleasant sensation to be relying on the beach only to have a maintenance worker sit to work with gas-powered two cycled intensity directly behind you.

If a manicured look is desired it can be accomplished by quiet means. Perhaps electrically powered landscaping maintenance machinery is an answer to noise abatement.

44. Developer to provide rubbish cans. Cans to be tactfully labelled and placed in 40' either side. Cans to be of a color not to contrast sharply with environment.

45. To keep the area clean. Litter bucket nearest ventilation shall be littered and effluent air shall be cleared and deodorized before released into the atmosphere.

To prevent the beach from being

1/5/87

irradiated with the smell of cooking 24 hrs a day. People go to the beach to enjoy the beach smells as well as waves, sunbath, and state of being. If one is reminded constantly of ones belly one can not appreciate the beach for itself alone.

Beats - the beach public won't be allowed and could not afford to eat at the hotel. Food smells won't be a distraction to beach enjoyment.

46. Outdoor concerts are permitted

47. Fireworks displays on July 4th and Jan 2nd to be permitted.

48. Pole fishing to be permitted

49. A volley ball net and are used to be permitted. ~~to be taken down at dusk~~ beach day.

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General Conditions of Permit Approval

Requirements -

1. Re-site hotel to south end of Kawano Bay subsequent to appropriate rezoning of that parcel and Kapauna Bay parcel.

Kapauna will be adversely affected by a huge hotel. Kawano Bay is already ruined by development and should be completely built before moving on to the next beach. Kawano is a "feasible" site physically and aesthetically.

2. Positive developer to abide by General Plan guidelines and responsible for a major resort -

Especially, the employee housing to be provided at a ratio of one unit of employee housing for every two units of hotel hotel. This to be built on current - not sometime - perhaps - maybe.

Kapauna is not available in subsequent

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50. Soft Bay Boards are permitted.

Flotation devices of this type are not dangerous and even permit weak or swimmers buoyancy.

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2. quantity or of a price affordable to employees except at an unreasonable distance. These people have families. Travel is time aways. Many of the employees experience family time engendered.

Also:

Many other General Plungquidlarie are being ignored by the County Planning Department. The public interest is not thereby served.

3. Connect every unit built to secondary sewage treatment plant on site.

Prevent effluent pollution of spring and springs and bay.

4. Require 100% solar water heating.

The sun shines a high percentage of time in this area. The requirement will reduce dependence on imported oil.

It will reduce need for solar film plants

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4. This will reduce air pollution in Miami and other off site areas on island.

5. Require waste heat recovery from air conditioning systems.

Energy savings will involve some items as reasons in #4 above.

6. Require efficient use of natural ventilation and lighting.

Save energy. save oil. Save time of payment to other nations.

7. Require wind-powered generator to drive pumps for deep well water. Hotel had heart. Pumps to be used only as back-up in emergency.

8. Require on site photo-voltaic system to reduce Helco grid use by at least 20%.

9. Reduce energy consumption.

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9. Require Mauna Kea Properties to participate in the construction or costs required for the proposed Kawaihae to Waimea Road.

To provide General Plan infrastructure requirements.

10. Require internal resort from service fish residents, guests, and public. Small rider fee. Tour/mon-politizing.

To prevent exhaust pollution from cars in and out of resort and within resort. Area is subject to stagnant air. Any is possible result.

11. Allow no building over 3 stories in height.

To prevent view obstruction or domination. To allow fire systems easier escape.

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1/5/87

12. To prevent noise intrusion into the beach experience. To permit shore reduction of beach waves.

13. Require a 10% room rental fee to be paid to the County of Hawaii and which shall be used strictly and only to pay for the costs of Police and Fire Protection services. ONLY and in total.

To make sure these services are and will be adequate.  
To reduce the insurance costs of the hotel, resort residences, and nearby developments.  
To save lives and property.

14. All construction waste shall be collected and appraisal of property.

To bring on site of hazardous materials, ground water pollution results possible.

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1/5/87

14. Wreppings, crates, cans, etc. can't be burned or blown away or dumped illegally (but shouldn't be). Provide monetary fence for isotone.

15. Allow no helipots within 1000' of beach or 40' setback area.

To prevent the helicopter from creating noise over beach.  
Helicopter fun come in too close to Hanalei Beach now. This must not become the case at Hapuna.

16. Locate showers and toilet mounds of the 40' setback. Public + Sust. use.

Forbid disinfectant solutions now create an ugly stink at Hapuna State Beach. That is a mistake that can be corrected at this project.

To provide alternative to beach ware of using pan or sand as toilet. Broom square.

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1/5/87

17. Require all resort roads to be dedicated to the County after 10 years just as at Naahoua Village. This is to eliminate deliberate barriers to social intercourse based on race, class, wealth, etc.

I have seen enough of the Mauna Kea Beach Hotel snobism and elitist exclusion. Not at Hapuna! This is Hawaii not South Africa!  
Require that water conservation plumbing fixtures be used throughout the project by hotel and residences.

Water is precious and will become more so in time. It is not a cost factor problem to install these efficient devices.

19. Require drip irrigation be used in a preferential basis over overhead sprinklers to limit water consumption.

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1/5/87

19. To save water. The West Hawaii population will soar by 2000.

20. Require (in restrictions in writing) that grey water, treated sewage effluents, and brackish water be used preferentially to pure clean well water for irrigation of grounds and particularly golf course.

Don't waste pure clean water to water plants that do well on tainted water. Water is precious.

21. Prior to electrical and water business opening (Guidance of business license) this shall be a "pre-approval" inspection and approval by the County Fire Department.

This is to assure fire safety and accountability and compliance. No turn the other way and wink.

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22. Hotel to provide a 24 hr nurse.

Guests have medical problems that are life threatening! A nurse can fill the 20 minute gap between Waimea and Hotel until an ambulance arrives.

23. This project is anticipated to produce

3.7 tons of solid waste per day.  
~~Mauna Kea Paper Co. Inc.~~  
should be required to help the county provide for disposal of that ~~paper~~ in some form other than normal land money paid.

The County is in a real waste crisis. They need producer projects like this to help alleviate the problems created.

24. Require Mauna Kea Properties (in conjunction with other nearby developments) to participate in a concurrent (with the Hotel) construction of:

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24. A Police Station  
A Fire/Rescue Station

Nearby and centrally located.

To provide public protection service.  
25. Require that all buildings in the entire resort shall have fire resistant roofing. Ban all shingles and shakes.

This area is hot, dry, and at times windy. With increasing population there will be increased fire incidence. Shingles and shakes dried by sun and fanned by wind cause houses to ~~catch~~ burn. California has learned the hard way. Let us prevent this problem.

26. Require that dry injectors, wells be used only in true over land or emergency situations such as floods.

This water should be reused - not discarded.

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1/5/87

27. Allow no object or plant to obstruct the view of the ocean from Queen Kaahumanu Highway.

This means no buildings, trees, walls, fences, etc. This means allow no irrigation of the area to produce "stunted" growth that will then obstruct the view even if not "planted". Water on bare unplanted earth will produce volunteer trees etc etc. See instructions!

28. Require that only fire resistant plant materials be used in landscaping.

Prevent fueling a wild fire.

29. Require a back up power system to operate the surge treatment plant at 100% of rated capacity in case of also power shortage or failure.

30. Require Mauna Kea Properties to provide, within the resort - development

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area public parking for beach access.  
Parking to be in a ratio of 1 stall  
for every 2 hotel rooms or 4, or 6,  
or 8 (but not less than 1 to 8.)

This is to insure public access.  
Since Napua is remote from cities  
and towns automobile parking is  
needed to provide access to this beach.  
Napua State Beach is increasingly  
the "capacity" of parking. Additional  
close proximity parking for aged,  
disabled, handicapped, and very young  
visitors is needed.

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1/5/87

Studies Needed Prior To Approval:

An updated study of the marine  
biology and environment should be  
conducted. It should be done at a  
time of calm water and good to  
excellent visibility. Not during turbulence  
as was done by the botanologist.

A. A current study of the need for  
a new resort should be conducted based  
on current world trends in economic,  
social unrest, nearby mega resorts,  
and increased County Tax Base.

C. A study of increased peripheral road  
usage into land out of project site  
area. In particular the Hawaiian Rd  
usage increase that have directly occurred  
due to the Hyatt Project and since  
the S. Kohala Resort will impact on  
further increase. Look at the County's  
liability to widen and maintain the  
Kauaehae Rd. or viability.



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1/5/87

D Study and analyse the amount of, and character of, and increase of crime associated with large scale broart development. A study of the effects on social structure and crime, was done in N. Tshela after the original Manna Ka Band Hotel was built. Refer to it.

E What are the health costs to the resident population due to changed social, cultural, dietary ordering? What illnesses become epidemic with the advent of cultural shock? There are health costs but they are not correlated because no one wants to hear it. It is time to shed some light. People are dying for wants!

F Study of skills list or grid as a result of broart development. The net result will be seen to be a deskilling of laborers. Servicing personnel do not need skills of high order.

### G. Energy Usage -

a) Who pays for generation plants?

b) Energy use pollutes the air. How much? Is that acceptable?

c) High fuel demand means higher cost due to competitive demand. How much increase? Is that acceptable?

H. Demographic Study Model of Existing Ambic Development Impacts.

To determine who leaves and who stays.

- a) By age
- b) Class
- c) Race
- d) Culture

### I Economy -

a) Are there increased or reduced because of development of bro-art? Are there subsidizing business activities?

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1/5/87

## I Economy

- Ⓒ Sensitivity to global economic factors. Tourism returns - fluctuations - share decline.
- Ⓒ Cost of living increase due to affluent immigration to island.
- Ⓒ Other industry displacement due to single industry focus.  
Namely agricultural land becomes too expensive due to speculation.
- Ⓒ How vulnerable to third world tourism competition is Hawaii? Cheaper labor and land in developing countries draw profit seeking corporations and economy inward towards.
- Ⓒ If multinationals own Hawaii tourist resorts and profits are

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1/5/87

exported off Hawaii whose economy is it? Who controls Hawaii's economy then? Not Hawaii. Who? And where does the bulk of profit go? Can it be kept here?

## In Conclusion -

Hapuna is serene and beautiful. It is a joy and gives people health and inspiration. It is an oasis in a desert of stress and exploitation. It is a place to think or experience the natural environment as it was created. Hapuna can not be impaired by man's tampering. It can be ruined. It can be destroyed. And with it an essential part of time will go too.

Do not let this occur. There are ways. There are valid reasons. There means must be addressed, not avoided conveniently - not again.

Tom Beck  
P.O. Box 69, Kamuela, HI

July 21, 1987  
87-1501

Mr. Tom Beach  
P.O. Box 69  
Kamuela, Hawaii 96743  
Dear Mr. Beach:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of January 5, 1987 and your detailed comments on the above project. Your letter has been thoroughly reviewed and most of your concerns will be addressed in the EIS that is now being drafted. We feel that some of your concerns, however, would be better addressed elsewhere, and I shall try to point out which ones they are in the remainder of this letter. Your concerns are reviewed as follows in the order that they appear in your letter.

**Concerns and Reasons for Concerns**

1. No fence, wall, gate, barrier, chain, or cable will be installed on the sandy part of the beach which is owned by the State of Hawaii. The 40-foot setback area is property owned by Mauna Kea Properties and proposed improvements as described in the EIS Preparation Notice will be subject to approval by the County of Hawaii.
2. Low-level, non-glare lighting is proposed along appropriate portions of the shoreline trail for safety reasons.
3. The developer has no authority to limit the public's use of radios and other sound producing devices on Hapuna Beach, which is part of the State Park. The hotel operator, not the developer, will determine appropriate use of its grounds. However, it is anticipated that the atmosphere desired will preclude extensive use of sound amplifying equipment outdoors.  
Further, condition number 11 of SMA Permit 85-16 specifies: "At no time shall the applicant be permitted to conduct food and beverage services, banquets, meetings, sporting events, picnics, barbecues, luaus, or other social activities either on any portion of Hapuna Beach or within the 40-foot shoreline setback area and an additional 20 feet mauka of the shoreline trail, whichever is further mauka."
4. Permit conditions will be specified by the Hawaii County Planning Commission.
5. The types of signs to be installed will be determined by the hotel operator and its design consultants, subject to review by the appropriate governmental agency.
6. It is expected that the hotel operator will employ beach attendants.

Mr. Tom Beach  
July 21, 1987 - page 2

7. Condition number 10 of SMA Permit 85-16 specifies in part: "Lounging chairs or other equipment used by resort and hotel residents and guests on the beach shall be permitted only if they are transported to and from the beach by the resort and hotel staff, residents, and guests in conjunction with their use. In order to prevent the appearance of a private beach enclave, lounge chairs shall not be permitted to either set up in advance of use or left on the beach after they are used."
8. The installation and use of permanent rafts, floats, or barriers in the bay would be subject to governmental permitting. There are no current plans for such devices. If floats or rafts are deemed desirable, a Conservation District Use Permit will be sought from the State.
9. Whether an ongoing State or County spring water analysis should be maintained is a decision for the State or County to make.
10. Emergency vehicles will have access to the beach through the resort when required.
11. Building codes and regulations will be adhered to.
12. Emergency phones are available at the Hapuna Beach State Park.
13. Drinking fountains are available at the Hapuna Beach State Park.
14. The beach is under State jurisdiction and there will be no uniformed and armed guard patrol of the beach by the hotel.
15. Fire codes will be adhered to.
16. Governmental regulations will be complied with.
17. See number 7 above.
18. Condition number 12 of SMA Permit 85-16 specifies in part: "At no time shall the applicant be permitted to place or build any structure, concession stand, or facility either on Hapuna Beach...; or within the 40-foot shoreline setback area and an additional 20 feet mauka of the shoreline trail, whichever is further mauka, for the purpose of...selling...food or beverages of any description..."
19. Hotels generally include sundries retail operations which sell bottled or canned beverages and it is anticipated that the proposed hotel will likewise include such facilities for the convenience of its guests.
20. Hotel shops will most likely sell cigarettes. The beach is currently maintained by the State and is expected to continue to be maintained by the State.
21. Hotel facilities will include lighting as appropriate; lighting will be designed so as to minimize adverse effects. The applicant will comply with the Hawaii County outdoor lighting ordinance (Hawaii County Code, Chapter 14, Article 9).

Mr. Tom Beach  
July 21, 1987 - page 3

22. Your comments on views are well taken. Your concerns will be addressed in the later detailed design stage of the hotel project; the design will comply with governmental codes and regulations. Please note that the landscape design plan for a private development does not normally require public approval. No landscaping is planned for the State owned lands adjacent to the privately owned lands.
23. The existing public shoreline trail from Hapuna Beach State Park to Spencer Park will continue to be maintained.
24. Condition number 8 of SMA Permit 85-16 specifies in part: "For the purpose of public access to the shoreline, the applicant shall provide both access to the shoreline and 40 public shoreline parking stalls on the South Kohala Resort.... The location, timing of construction and/or availability, restrictions on use and related signage for both the public shoreline access, and parking shall be subject to the approval of the director."
25. The public shoreline trail is open at all times to the public and hotel guests alike.
26. The use of chemicals on the resort grounds will be addressed in the EIS.
27. No swimming pool effluent will be released into the 40-foot setback area or beach area.
28. No ramp from the mauka area into sand is now planned.
29. The applicant will not alter the area seaward of the certified shoreline, which is State owned land.
30. No sea wall, breakwater dock, port, or steps are planned.
31. Condition number 11 of SMA Permit 85-16 specifies in part: "At no time shall the applicant be permitted to conduct...meetings...or other social activities either on any portion of Hapuna Beach or within the 40-foot shoreline setback area and an additional 20 feet mauka of the shoreline trail, whichever is further mauka."
32. Detailed landscape plans for the 40-foot setback area have not yet been prepared. However, it is expected that the character of the vegetation will change.
33. Some existing trees will remain on-site.
34. The beach area seaward of the certified shoreline is under the State's jurisdiction and is subject to State regulations.
35. Noise from hotel operations will be minimized for the comfort of the public and resort guests.
36. Government rules regulate dust emissions allowed in the ocean or the beach.
37. Construction will occur during normal work-week daylight hours.
38. No blasting is planned during construction.

Mr. Tom Beach  
July 21, 1987 - page 4

39. Lighting in the 40-foot setback area will be low impact lighting.
40. The 40-foot setback area is privately owned and it is expected that it will be maintained with the use of appropriate machinery.
41. The resort operator will provide trash receptacles in the 40-foot setback area.
42. 43. 44. Missing from your letter.
45. Normal sanitation measures will be taken in compliance with State Department of Health regulations.
46. 47. 48. 49. 50. The beach area seaward of the certified shoreline is under the State's jurisdiction and activities on the beach are permitted or controlled by the State.

#### General Conditions of Permit Approval

Suggestions for conditions of permit approval should be addressed to the appropriate government agencies. We understand that the Hawaii County Planning Department has received a copy of this letter. Also, your letter will be included in the EIS and other government agencies will review the EIS during the permitting process.

#### Studies Needed Prior to Approval

- A. A second survey of the marine environment was conducted during the last week of May this year, during a time of calmer water conditions. (The first survey was performed during a more turbulent winter month.) The results of this survey will be included in the EIS.
- B. An updated market analysis has been prepared and the results will be included in the EIS.
- C. A traffic study has been prepared for the EIS; it addresses regional cumulative impacts in addition to impacts due to the South Kohala Resort project.
- D. The social impacts of resort development, that of South Kohala Resort in particular, have been assessed in a socioeconomic impact analysis prepared for the EIS.
- E. The questions you pose here, though valid, are too broad to answer properly within the context of the EIS being prepared specifically for the proposed South Kohala Resort development.
- F. A discussion of construction period and operational employment and categories of employment will be included in the EIS.
- G. Energy usage, as it pertains to the proposed South Kohala Resort, will be addressed in the EIS.
- H. Demographic data will be included in the socioeconomic impacts section of the EIS.

LAHAIKU CORP  
 MAUI TRUST  
 MUC FAIRBANKS  
 MAGDOON ESTATE, LIMITED  
 MAUNA KEA LAND CORP  
 MAUNA KEA REAL ESTATE  
 OCEANIC INVESTMENT, INC  
 OLAKEA BAY RANCH  
 PULUOHAI ESTATES  
 QUERRETT MANOR  
 R. M. TOWELL CO  
 REALTY INVESTMENT  
 REALTY INVESTMENT  
 WAIKAI RANCH ASSOCIATES  
 WAIKAI RANCH ASSOCIATES  
 WEST HAWAII CONCRETE  
 KERRY YOUNG REALTOR

AIRCOA, INC.  
 AMFAC, INC.  
 B. B. BISHOP ESTATE  
 CALIFORNIA KOHALA CORP  
 DILLI-KOAH INVESTMENT CORP.  
 FIRST HAWAIIAN BANK  
 GENTRY PACIFIC LIMITED  
 HALE KEA FARMS  
 HAWAII LAND MANAGEMENT, INC.  
 HONOLULU MANAGEMENT, INC.  
 KALUA-KOHA INVESTMENT CORP.  
 KAIKAPUHEA RANCH, LTD  
 KAIKAPUHEA RANCH, INC.

Mr. Tom Beach  
 July 21, 1987 - page 5

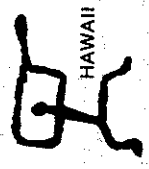
I. Here again, although your comments are thought provoking, they are too broad to be addressed in the context of an EIS for a single resort.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,

*Anne L. Mapes*  
 Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
 Mr. A. Lono Lyman, Hawaii County Planning Department



HAWAII LEeward PLANNING CONFERENCE  
 P.O. BOX 838 • KALUA-KOHA, HAWAII 96745-0838

December 24, 1986

Ann L. Mapes  
 Belt, Collins & Associates  
 606 Coral Street  
 Honolulu, HI 96813

Dear Ms. Mapes:

The South Kohala Coast has had more EIS's prepared for it than the whole rest of the island put together. I do not believe that there is any issue that has not been adequately studied and addressed. I, therefore, suggest that you only address specific issues that have not been already studied and for this particular parcel I can think of none.

Thank you for this opportunity to respond.

Sincerely,  
*H. Peter L'Orange*  
 H. Peter L'Orange  
 President

HPL:sjs  
 cc: Albert Lyman

**BELT COLLINS  
& ASSOCIATES**

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7430474 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colarabo • Hong Kong • Japan

June 5, 1987  
87-1195

Mr. H. Peter L'Orange, President  
Hawaii Leeward Planning Conference  
P.O. Box 635  
Kailua-Kona, Hawaii 96745-0635

Dear Mr. L'Orange:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for the letter of December 24, 1986 regarding the EIS Preparation Notice and Environmental Assessment for the above project. Although you did not have any specific comments, we appreciate the time you spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to comment on the project at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:mlf

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

**HAWAIIAN TEL GIB**

Hawaiian Telephone Company,  
P.O. Box 4249  
Hilo - Hawaii 96723  
Telephone (808) 935-9411

December 30, 1986

Ann L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Subject: Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Hawaiian Telephone Company has no additions or objections to the subject EISPW based on the presumption that the proposed telephone feeder and distribution cable facilities will be underground.

We may, however, elect to participate in the proposed Environmental Impact Statement (EIS) should it become necessary. Accordingly, we request that a copy of the proposed EIS be submitted to us for review and comment.

Should you have any questions, please call me at 935-9515.

Sincerely,

*Derrick M. Uyeda*  
Derrick M. Uyeda  
Hawaii Island Manager

DMU:hvg



DEC 27, 1986

June 5, 1987  
87-1202

Mr. Derrick M. Uyeda  
Hawaii Island Manager  
Hawaiian Telephone Company  
P.O. Box 4249  
Hilo, Hawaii 96720

Dear Mr. Uyeda:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of December 30, 1986 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the material and your concerns have been noted. It is expected that telephone feeder and distribution cable facilities will be underground at South Kohala Resort.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. As requested, we shall forward you a copy of the report when it becomes available.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:if

cc: Mr. William F. Mielcke, Mauna Keo Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Ms. Anne Mapes  
Belt Collins and Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

On behalf of the Big Island Chapter, included are comments for your consideration during the preparation phase of the E.I.S. for the South Kohala Resort.

One major area of concern is the impact of a resort located at the most popular white sand beach on the island. The impact occurs visually, as well as thru possible overcrowding, and thru a perceived change in the character of the beach. In the assessments which have been prepared for this project, much focus has been given to a 1970 plan by the state for future expansion of the Hapuna Beach State Park. In cooperation with the State of Hawaii would you please determine the current schedule and likelihood of implementation of these expansion plans? Could you also prepare an inventory of other sandy beach areas in West Hawaii, and indicate their suitability for accommodating the recreational needs of an expanding West Hawaii population?

A second major area of concern is the population immigration which can be expected to staff this and other resort areas in West Hawaii. It is undoubtedly important to foresee where these immigrants will come from, where they will be housed, and what their impact will be on the community. What magnitude of public expenditures will be needed for them? Do you have access to prior studies which would indicate the degree of stress to an existing community's character from such immigration? Can you quantify the rate of population change that can be expected from this and other planned resort developments?

There is also potential for degradation of the marine environment thru runoff during construction, as well as leaching of nutrients from the resort in its operation. Prior assessment data relies almost entirely on a study conducted by Stephen Dollar, a marine consultant. My personal experience is that the marine environment at Hapuna is quite good for swimming and snorkeling for the larger part of the year, from April thru October. During the winter months the beach is heavily used for body-surfing and boogie-boarding. However, Mr. Dollar finds few important assets in the marine environment from an aesthetic viewpoint. He finds the area one of the most sub-optimal regions on the entire west coast of Hawaii. That means not very good I would think. Due to the



# LIFE OF THE LAND

page 2  
DEC 27, 1986

**BELT COLLINS  
& ASSOCIATES**  
Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5461 • Telex BELH 749273 • Fax (808) 520-3414  
Hawaii • Singapore • Australia • Colombia • Hong Kong

July 20, 1987  
87-1499

difference of opinion, would you please include some alternative evaluation of the value and sensitivity of the marine environment at Hapuna Bay, and between Hapuna and Kaunaoa Bay?

Finally, in light of the visual impacts on Hapuna Beach, would you please explore alternative sitings of the hotel, ocean-front condominiums and the beach club? Could the hotel be sited some ways north of Hapuna, such that the hotel view would be of the ocean, but that the guests might have a short walk to the south to get to Hapuna Beach?

Thanks in advance for your attention to our concerns.

sincerely,

Bill Graham,  
Big Island representative

Mr. Bill Graham  
Big Island Representative  
Life of the Land  
P. O. Box 155  
Hawi, Hawaii 96719

Dear Mr. Graham:

### Environmental Impact Statement (EIS) for Proposed South Kohala Resort Development South Kohala, Hawaii

Thank you for your letter of December 27, 1986 commenting on the EIS Preparation Notice and Assessment for the above project. We appreciate the time you spent reviewing the materials. Your concerns, in their order of appearance in your letter, are addressed as follows.

**Beach Park Expansion and Development** The EIS will analyze the potential impacts on Hapuna Beach State Park due to increases in visitors and island residents following construction of South Kohala Resort and other planned development on the island of Hawaii. We have consulted with State Department of Land and Natural Resources (DLNR) staff regarding State plans for park expansion and development. You may be interested to know that the State Parks Division of DLNR is now exploring possibilities for new West Hawaii beach parks. The results of the technical study will be published in a few months.

**Population Immigration** A socioeconomic impact study is being prepared for the EIS. Your concerns about housing, public expenditures, and community character as well as potential socioeconomic impacts will be addressed either quantitatively or, where more appropriate, qualitatively in the report. Prior studies on resort employment and immigration have been reviewed for the socioeconomic impact analysis.

**Marine Environment** I have consulted with Dr. Steven Dollar and he concurs with you that the months of April through October are most likely better than the winter months for swimming and snorkeling in Hapuna Bay. As you know, Dr. Dollar conducted his fieldwork for the original marine baseline assessment in February 1984. Mauna Kea Properties has retained Dr. Dollar to resurvey the offshore area. He conducted a second marine survey in the same area between Hapuna Bay and Kaunaoa Bay during the last week of May of this year and the results will be reported in the EIS.

To supplement the marine survey, an assessment of potential environmental impact due to chemical use associated with development, including impact on the marine environment, has been made in the context of a fertilizer and pesticide study undertaken for the proposed project.



Mr. Bill Graham  
July 20, 1987 - page 2

Aloha Ms. Mapes:

January 14, '87

In regards to the Environmental Impact Statement being prepared by Belt, Collins and Young for Mauna Kea Properties for the proposed South Kohala Resort at Hapuna beach, I would like to see the following questions addressed:

- 1) An extensive underground aquifer exists at the proposed hotel site, which surfaces at the back of the beach in a small pond and at the shoreline in fresh water springs. This pond and spring should be indicated on the maps and "concept plans" drawn up for

MKP, as well as discussed in the text of the EIS. A description of how the springs may be affected should include worst case scenarios, such as oil or pesticide spills.

- 2) In the discussion of viewplanes, the EIS should state that the view of the Kohala Mountains will be cut off by the hotel structure planned, as you're looking makai to mauka.

In the discussion of the potential impacts the EIS should present and summarize all impacts objectively.

A new population impact study should also be done with a headcount of beach users on the busiest days of the year, such as the 4th of July.

Visual Impacts on Hapuna Beach. Alternative sitings of the hotel and other resort amenities have been explored and rejected in favor of the proposed sitings after weighing the advantages and disadvantages of the alternatives. The EIS will include discussion pertaining to this subject.

We expect to submit the Draft EIS to the State Office of Environmental Quality Control (OEQC) in the next two months. The availability of the report will be announced in the OEQC Bulletin and you will have an opportunity to make further comment at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Thank you,  
*Ms. Jacque Prêtre*  
Ms. Jacque Prêtre  
PO Box 888  
Captain Cook, HI. 96701

BELT COLLINS  
& ASSOCIATES  
INCORPORATED - HAWAII  
1000 KALANANAKU AVE., SUITE 1000, HONOLULU, HI 96813

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Hawaii • Singapore • Australia • Colorado • Hong Kong • Japan

July 20, 1987  
87-1498

Ms. Jacque Prell  
P. O. Box 888  
Captain Cook, Hawaii 96704

Dear Ms. Prell:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 14, 1987 concerning the preparation of the EIS for the above project. Your concerns, in their order of appearance in your letter, are addressed as follows.

According to the Belt Collins staff hydrologist, who has done extensive professional work in the West Hawaii region during the past 15 years, the water springs you refer to are most likely ponds of brackish groundwater. Such groundwater occurs commonly along the West Hawaii coast. The EIS will address the issue of resort development impact on water sources.

We note your continuing concern regarding use of pesticides at the resort. To address this concern, the applicant has contracted to have a chemical use impact study prepared for the project and the results will be reported in the EIS.

The EIS will contain a full discussion of visual impacts, particularly impacts from the public beach area.

As you know, beach counts were taken at Kapuna beach from June 24 through July 7, 1985 and at Kaunaoa beach during the last two weeks of July 1985. More recent hourly counts were made at the two beaches during the past Christmas and New Year's holiday period, again for two weeks. The new counts were done specifically during the busiest days of the year, when hotel occupancy was at its peak and students were out of school for the mid-winter break. The results of these counts will be analyzed in the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



Save Hawaii Save Hawaii Save Hawaii Save Hawaii Save Hawaii Save Hawaii  
Hawaii Save Hawaii Hawaii Save Hawaii Hawaii Save Hawaii  
Save Hawaii Save Hawaii Save Hawaii Save Hawaii Save Hawaii Save Hawaii  
**SAVE HAWAII**  
FOUNDATION

"a voice for the environment"

RECEIVED

JUL 31 1987

BELT, COLLINS & ASSOCIATES

Miss Anne Mapes  
606 Coral St.  
Honolulu, HI: 96813

July 25, '87

Dear Miss Mapes:

Thank you for the letter regarding the Environmental Impact Statement for Proposed South Kohala Resort Development.

One correction I'd like bring to your attention; the springs of water in referring to include not only the ponds of brackish groundwater, but also freshwater which bubbles up from underground at the ocean's edge at the west northern end of Kapuna beach. The ponds you referred to in the letter to me, dated July 20, 1987, are at the back of the beach, very far away from the springs at the edge of the ocean. The springs at the edge of the ocean are only slightly brackish - only slightly salty. Please adding these springs also - and send me a copy of the EIS. Thank you,  
Ms. Jacque Prell

SAVE HAWAII!

328-9482

OVER

Also, I'd like to request that a public hearing be held for public input on the Draft EIS.

Catastrophic accidents which may affect the quality of the spring and ocean should be discussed in the Draft EIS, also.

Thank you,

Ms. Jacquelyn Reed

RECEIVED

JAN 10 1987

JAN 5, 1987

BELT COLLINS & ASSOC.  
606 CORAL ST.  
HONOLULU, HI. 96813

GENTLEMEN:

THANK YOU FOR REQUESTING COMMENTS FROM THE SAVE HAPUNA INITIATIVE PETITION PETITIONERS COMMITTEE FOR THE EIS FOR MAUNA KEA PROPERTIES (MKP) PROPOSED "SOUTH KOHALA RESORT".

THIS DEVELOPMENT WAS REFERRED TO AS THE "HAPUNA BEACH RESORT" IN LUC AND EARLY PLANNING DEFT DOCUMENTS. MKP'S RECENTLY RENAMED "SOUTH KOHALA RESORT" WILL HEREAFTER BE REFERRED TO AS ITS ORIGINAL, MORE ACCURATE, AND LESS DISSEMBLING NAME, "HAPUNA BEACH RESORT".

THERE ARE NUMEROUS ISSUES OF UTMOST CONCERN THAT NEED TO BE FULLY ADDRESSED IN THE EIS IN ORDER THAT THE FULL ADVERSE IMPACTS OF THE HOTEL AND RESORT ON HAPUNA AND KAUNADA BEACHES BE RECOGNIZED BY BOTH THE PLANNING COMMISSION AND THE PUBLIC. HERE ARE BUT A FEW OF THE SPECIFIC QUESTIONS, ISSUES AND TOPICS THAT NEED TO BE FULLY ADDRESSED IN THE EIS:

1 HAPUNA & KAUNADA BAY POLLUTION

2 ALTERNATIVE HOTEL SITES

3 VIEWPLANE

4 THE LIKLIHOOD/UNLIKLIHOOD OF EXPANDING HAPUNA BEACH STATE PARK TO MAILEA BAY (BEACH 69)

5 EXPANDING KONA KOHALA AND HAWAII ISLAND POPULATION AND ITS IMPACT ON HAPUNA AND KAUNADA BEACHES.

6 CLASH BETWEEN LOCAL USERS AND RESORT GUESTS AND RESIDENTS

7 THE DEBASEMENT OF HAWAII ISLAND AS A VISITOR DESTINATION WHEN ONE HOTEL DOMINATES OUR ISLAND'S BEST COASTAL RECREATIONAL RESOURCE.

8 VERY LIMITED, RESTRICTED AND CONTROLLED PUBLIC SHORELINE ACCESS TO KAUNADA BAY AT THE WESTIN MAUNA KEA HOTEL

9 THE IMPACT OF THE HAPUNA BEACH RESORT, ESPECIALLY A HOTEL AT HAPUNA ON THE LIMITED COASTAL RECREATIONAL RESOURCES OF HAWAII ISLAND.

10 RETAINING ALL EXISTING VEGETATION WITHIN THE 40 FOOT SHORELINE SETBACK ABUTTING HAPUNA BEACH IN ORDER TO MAINTAIN THE NATURAL BEAUTY OF HAPUNA AND THAT HAPUNA BEACH DOESN'T BECOME AN EXTENSION OF THE HAPUNA HOTEL

11 EMPLOYEE HOUSING

12 LACK OF SUFFICIENT FRESH WATER

1. HAPUNA AND KAUNADA BAY POLLUTION

FRESH WATER SPRINGS (AFTER WHICH HAPUNA IS NAMED) FLOW INTO THE OCEAN AT THE SHORE AT THE NORTH END OF HAPUNA BEACH. PLEASE DISCUSS IN THE EIS WHAT EVIDENCE YOU HAVE THAT SURFACE RUNOFF OF TOXIC WASTES, AND POISONS LEACHING INTO THE GROUND FROM THE LANDSCAPED HOTEL GROUNDS, THE GOLF COURSE, AND 500 ACRE RESIDENTIAL AREA SURROUNDING HAPUNA AND KAUNAO BAYS, AS WELL AS CONTAMINANTS FROM BLACK AND GREY WATER WASTE FROM THE HOTELS SEWAGE SYSTEM AND 800 RESIDENTIAL UNITS ABOVE AND BELOW QUEEN KAARUMANU HWY, WILL NOT END UP IN THE WATERS OF HAPUNA BAY OR KAUNAO BAY. THIS IS OF UTMOST CONCERN TO THE PUBLIC HEALTH AS HAPUNA BEACH AT HAPUNA BEACH STATE PARK IS NOT ONLY HAWAII ISLAND'S BEST BEACH IT IS ALSO ITS MOST USED BEACH. PLEASE SITE IN YOUR DISCUSSION OF THIS MATTER THE SPECIFIC TESTS YOU HAVE MADE TO DETERMINE THE LIKLIHOOD OF BAY POLLUTION FROM RESORT DEVELOPMENT AT HAPUNA.

THE POTENTIAL PROBLEM OF WATER POLLUTION AT HAPUNA BEACH STATE PARK IS FURTHER COMPOUNDED BY THE NATURAL DRAINAGE CHANNEL THAT RUNS THROUGH THE RESORT PROPERTY ENDING AT THE PUBLIC BEACH AT THE NORTH END OF HAPUNA. THIS DRAINAGE CHANNEL MAY FURTHER COLLECT TOXIC, FECAL, BACTERIAL AND VIRAL CONTAMINANTS FROM THE RESORT SITE THAT WILL POLLUTE THE OCEAN AND JEOPARDIZE THE PUBLIC HEALTH OF BEACH AND PARK USERS. PLEASE DISCUSS IN YOUR EIS THE POTENTIAL OF BAY POLLUTION VIA THIS CHANNEL AS WELL AS THE DRAINAGE AT THE SOUTH KOHALA RESORT THROUGH 6 MAJOR FAIRLY WELL DEFINED MAUKA/MAKAI DRAINAGEWAYS THAT CARRY RUNOFF TO THE SHORELINE".

PLEASE DISCUSS IN THE EIS THE POTENTIAL FOR CONTAMINATING THE FRESH WATER RESOURCE THAT FLOWS UNDER THE RESORT SITE AND EMPTIES INTO HAPUNA BAY.

## 2. ALTERNATIVE HOTEL SITES

THERE ARE EXCELLENT ALTERNATIVES TO BUILDING AN ENORMOUS HOTEL (4 FOOTBALL FIELDS LONG AND 100 FEET AT ITS HIGHEST POINT) ON THE HILLSIDE THAT OVERLOOKS ALL OF HAPUNA BAY, THE NORTH END OF HAPUNA BEACH, AND HAPUNA BEACH STATE PARK INCLUDING MOST OF THE SANDY BEACH FRONTING THE PARK.

ONE SUCH ALTERNATIVE IS THE BEACH AT MAUUMAI A FEW HUNDRED YARDS NORTH OF THE WESTIN MAUNA KEA HOTEL. THERE IS VIRTUALLY NO PUBLIC USE OF THE FINE MINI-HAPUNA BEACH AT THIS SITE. MOST OF THE AREA AROUND THIS BEACH EXCEPT FOR THE ROTH PROPERTY IS UNDER THE CONTROL OF MAUNA KEA PROPERTIES. PLEASE DISCUSS IN YOUR EIS WHAT PAST AND RECENT EFFORTS HAVE BEEN MADE TO ACQUIRE THE ROTH PROPERTY AT MAUUMAI BEACH AS AN ALTERNATIVE HOTEL SITE TO HAPUNA.

ANOTHER ALTERNATIVE HOTEL SITE IS AT THE NORTH END OF THE SOUTH KOHALA RESORT WHICH TERMINATES A FEW HUNDRED FEET FROM THE SOUTH END OF KAUNADA BAY. SINCE PUBLIC PARKING FOR ACCESS TO KAUNADA BEACH AT THE WESTIN MAUNA KEA IS RESTRICTED TO A MERE 10 VEHICLES, AND THE HOTEL CONCENTRATES ITS GUEST FACILITIES AT THE NORTH END OF THE BEACH, THE SOUTHERN HALF OF KAUNADA BEACH IS USUALLY EMPTY. A HOTEL ON THIS PART OF THE RESORT PROPERTY, OVERLOOKING THE OCEAN AND KAUNADA BAY, WITH ACCESS TO KAUNADA BEACH WOULD MAKE AN EXCELLENT HOTEL SITE WITHOUT IMPACTING THE ALREADY HEAVILY USED HAPUNA BEACH. PLEASE DISCUSS IN YOUR EIS YOUR USING THE NORTH END OF THE HAPUNA BEACH RESORT AT KAUNADA BAY AS AN ALTERNATIVE HOTEL SITE AND IF IT IS NOT AN ACCEPTABLE ALTERNATIVE TO HAPUNA EXPLAIN IN DETAIL WHY IT IS NOT. PLEASE SITE IN THE EIS THE STUDIES YOU HAVE MADE REGARDING THIS ALTERNATIVE.

SINCE MKP ALREADY CONTROLS AND DOMINATES HAWAII ISLAND'S 2ND BEST WHITE SAND BEACH (KAUNAOA), PLACING THEIR RESORT HOTEL IN SUCH A POSITION AS TO DOMINATE THE VIEW AND USE OF OUR ISLAND'S BEST BEACH AND PARK (HAPUNA) IS AN UNNECESSARY, UNJUSTIFIED, AND UNDESIRABLE USE OF THIS PRECIOUS PUBLIC RECREATIONAL RESOURCE--ESPECIALLY WHEN SUCH EXCELLENT ALTERNATIVE DO EXIST.

## 3. VIEWPLANE

THE HOTEL WILL BE 4 FOOTBALL FIELDS LONG. IT'S HIGHEST POINT WILL BE NEARLY 100 FEET FROM THE BOTTOM OF THE BOTTOM BUILDING TO THE TOP OF THE TOP BUILDING AND WILL START 200 FEET FROM THE VEGETATION LINE AT THE NORTH END OF HAPUNA BEACH. THIS HIGHEST POINT WILL PROTRUDE ABOVE THE TOP OF THE HILL AND INTO THE SKYLINE AT THAT PART OF THE NORTH END HILLSIDE WHICH IS MOST VISIBLE FROM THE ENTIRE NORTH THIRD OF HAPUNA BEACH, THE ENTIRE HAPUNA BAY, AND MOST OF THE BEACH AT HAPUNA BEACH STATE PARK DEPENDING ON THE SEASON OF THE YEAR AND HOW MUCH OF THE BEACH HAS BEEN WASHED OUT TO SEA. THE POOL DECK WILL START 50 FEET FROM THE SANDS OF HAPUNA BEACH AND THE POOL WILL BE LOCATED 120 FEET FROM THE EDGE OF THE SAND. PLEASE AFFIRM OR CORRECT THESE FIGURES IN YOUR EIS AS CONTRADICTIONARY FACTS HAVE BEEN PROMULGATED BY MKP.

THE HOTEL IS SO DESIGNED SO THAT EVEN WITH LANDSCAPING ALL GUEST ROOM WINDOWS FACING HAPUNA FROM THE NORTH END HILLSIDE WILL HAVE AN OPEN VIEW OF HAPUNA BEACH. AS SUCH HAPUNA BEACHGOERS WILL HAVE A FULL VIEW OF THE HOTEL ON THE HILL OVERLOOKING HAPUNA. FURTHERMORE, THE "CLUBHOUSE", MAKAI OF THE HOTEL NEAR THE SHORELINE NORTH OF HAPUNA BEACH IS VISIBLE FROM NEARLY EVERY POINT OF HAPUNA BEACH. PLEASE DISCUSS IN YOUR EIS HOW HOTEL GUESTS WILL BE ABLE TO VIEW HAPUNA BEACH WITHOUT BEACHGOERS LIKEWISE SEEING THE HOTEL STRUCTURE. PLEASE DISCUSS IN YOUR EIS HOW MANY GUEST ROOMS YOU INTEND TO BLOCK WITH VEGETATION SO THAT GUESTS WILL NOT BE ABLE TO SEE THE BEACH AND BEACH GOERS WILL NOT BE ABLE TO SEE THE HOTEL.

IN LITE OF THE ABOVE DESCRIPTION OF THE VISUAL IMPACT OF THE HILLSIDE HAPUNA HOTEL, PLEASE EXPLAIN IN MORE DETAIL IN YOUR EIS WHAT YOU MEAN BY "MAUKA VIEWS FROM THE SHORELINE ARE EXPECTED TO BE SOMEWHAT AFFECTED". SHOULD'N'T IT CORRECTLY STATE THAT THE VIEWPLANE FROM HAPUNA BEACH AND HAPUNA BEACH STATE PARK WILL BE ENORMOUSLY AFFECTED AS IT PERTAINS TO THE VIEWPLANE FROM HAPUNA BEACH? ALSO PLEASE EXPLAIN HOW YOU EXPECT THE EXISTING NATURAL BEAUTY OF THE MAUKA VIEWS FROM THE SHORELINE ALONG HAPUNA BEACH TO BE "IMPROVED" BY DESTROYING MUCH OF WHAT ALREADY IS THERE?

PLEASE INCLUDE IN YOUR EIS PHOTOGRAPHS OF THE NORTH END HILLSIDE HOTEL SITE WITH AN OVERLAY OF THE APPROX. 100 FOOT HIGH TERRACED STRUCTURES ON IT, TAKEN FROM THE ROCK OUTCROPPING AT HAPUNA BEACH THAT BEGINS THE NORTH THIRD OF THE BEACH SO THAT THE PUBLIC CAN GET A REAL UNDERSTANDING OF WHAT THE HILLSIDE HAPUNA HOTEL WILL LOOK LIKE. ALSO PLEASE INCLUDE IN YOUR EIS A SIMILAR PHOTOGRAPH OF THE 100 FT HIGH PART OF THE HOTEL FROM HAPUNA BAY AT A POINT WHERE THE UNDERWATER ROCK OUTCROPPING IN THE MIDDLE OF HAPUNA BEACH IS LOCATED AT A TIME THAT THE SAND AT HAPUNA IS BACK IN PLACE. IT IS NOT NECESSARY TO SHOW PHOTOS OR DIAGRAMS OF THE MAUKA PARTS OF THE HOTEL THAT ARE NOT AS HIGH AS OR AS VISIBLE AS THE PARTICULAR HILLSIDE SITE IN QUESTION.

4. THE LIKLIHOOD/UNLIKLIHOOD OF EXPANDING HAPUNA BEACH STATE PARK TO WAILEA BAY.

MKP'S EXPECTATION THAT HAPUNA BEACH STATE PARK WILL BE EXPANDED TO ENCOMPASS THE BEACH AT WAILEA BAY AND THE 550 ACRES MAUKA OF IT IS A KEY FACTOR IN MKP'S MINIMIZING THE IMPACT OF THE HAPUNA BEACH RESORT ON HAPUNA BEACH AND THEREBY JUSTIFYING A HOTEL AT HAPUNA.

PLEASE DISCUSS IN YOUR EIS THE BASIS FOR YOUR BELIEF THAT HAPUNA STATE PARK WILL BE EXPANDED TO INCLUDE AN ADDITIONAL 500 ACRES AROUND WAILEA BAY AKA "BEACH 69". WHILE IT IS TRUE THAT THIS AREA IS PART OF THE 15 YEAR OLD HAPUNA BEACH STATE PARK PLAN, IT IS ALSO TRUE THAT NOTHING HAS BEEN DONE TO IMPLEMENT THIS PLAN FOR THE 15 YEARS IT HAS BEEN IN EFFECT, EVEN THE "HIGHEST PRIORITY" ACTION URGED BY THE PARK PLAN WHICH WAS TO ACQUIRE THE 17 PRIVATELY OWNED HOUSE LOTS BETWEEN WAILEA BEACH AND THE PROPOSED PARK WHILE THEY WERE STILL AFFORDABLE. WHAT HAS BEEN DONE IS TO ALLOW DEVELOPMENT TO TAKE PLACE IN THE WAILEA BAY AREA THEREBY INCREASING THE VALUE OF THE PROPERTY THE STATE WOULD HAVE TO ACQUIRE TO EXPAND HAPUNA STATE PARK. PLEASE INDICATE IN YOUR EIS THE PRICE OF ALL WAILEA BAY LOTS AS WELL AS THEIR ESTIMATED CONDEMNATION VALUE IN ORDER TO DETERMINE HOW REALISTIC IT IS TO EXPECT THE STATE TO ACQUIRE THESE VERY EXPENSIVE LOTS. SUCH ACQUISITION IS A PREREQUISITE FOR THE EXPANSION OF HAPUNA BEACH STATE PARK TO WAILEA BAY. THIS IS A VERY CRITICAL FACTOR AS YOUR CONTENTION THAT HAPUNA BEACH CAN WITHSTAND THE IMPACT OF HAPUNA BEACH RESORT USERS IS BASED ON THE ASSUMPTION THAT HAPUNA BEACH STATE PARK IS 550 ACRES NOT 65 ACRES.

ALSO PLEASE DISCUSS IN YOUR EIS THE USER IMPACT OF THE 1150 UNIT HAPUNA BEACH RESORT ON HAPUNA BEACH SHOULD THE PARK EXPANSION PLAN FAIL TO MATERIALIZE.

ALSO, IN THE EVENT HAPUNA BEACH STATE PARK IS EXPANDED TO WAILEA BAY, PLEASE DISCUSS IN YOUR EIS THE IMPLICATIONS OF THE DEVELOPMENT OF THE EXISTING HOTEL SITE AT THE NORTH END OF WAILEA BAY ON USEAGE OF BOTH HAPUNA BEACH & WAILEA BEACH.

ALSO, PLEASE INCLUDE IN YOUR EIS ACCURATE DATA AS TO THE USEABLE SANDY BEACH AREA AT WAILEA BAY WHICH YOU EXPECT WILL MITIGATE THE BURDEN OF THE HEAVY USEAGE OF HAPUNA BEACH. IT IS MY OBSERVATION THAT THE USEABLE SANDY AREA AT WAILEA BAY IS CONSIDERABLY LESS THAN 10% THAT OF HAPUNA SO THAT EVEN IF THE PARK WAS EXPANDED TO INCLUDE WAILEA BAY IT WOULD PROVIDE SCANT MITIGATING BENEFITS REGARDING OVERCROWDING OF HAPUNA BEACH BY THE HAPUNA BEACH RESORT NOT TO MENTION THE IMPACT FROM THE EXPECTED RESORT GROWTH IN KONA AND KOHALA.

5. EXPANDING POPULATION AND ITS IMPACT ON HAPUNA AND KAUNAO BEACHES.

RESIDENTS FROM ALL PARTS OF HAWAII ISLAND USE HAPUNA BEACH, NORTH AND SOUTH KOHALA AND NORTH KONA ARE DISTRICTS OF THE ISLAND THAT ARE NEAREST TO HAPUNA AND FROM WHICH MOST HAPUNA USERS ORIGINATE. THESE DISTRICTS ARE ALSO THE FASTEST GROWING ON THE ISLAND AND THIS GROWTH WILL HAVE A TREMENDOUS IMPACT ON THE USE OF HAPUNA BEACH BY RESIDENTS AND VISITORS ALIKE. JUDGE SHUNICHI KIMURA IN GRAHAM VS LYMAN SAID THAT THE RESORT WOULD HAVE A "TREMENDOUS IMPACT ON HAPUNA" AND THAT "ANYONE WHO SAYS OTHERWISE IS CRAZY".

ALREADY THE BEACH AT HAPUNA BEACH STATE PARK IS OVERCROWDED ESPECIALLY ON HOLIDAY WEEKENDS AND ESPECIALLY IN THE WINTER WHEN HALF OR MORE OF THE BEACH IS WASHED INTO THE OCEAN THEREBY REDUCING THE SIZE OF THE BEACH AT THE TIME MOST PEOPLE SEEK TO USE IT. ON MANY WEEKENDS THROUGHOUT THE YEAR AND ON EVERY HOLIDAY WEEKEND ALL THE PARKING LOTS ARE FILLED WITH OVERFLOW CARS PARKED UP AND DOWN NEARBY STREETS. IN 1987 IT CAN BE SAID THAT HAPUNA BEACH IS FAST APPROACHING ITS CAPACITY.

THE INFORMATION IN THE ORIGINAL ENVIRONMENTAL ASSESSMENT REGARDING USER IMPACT OF THE HAPUNA BEACH RESORT ON HAPUNA BEACH IS INADEQUATE AND MISLEADING AS IT RESTRICTS ITSELF ONLY TO USEAGE BY HAPUNA HOTEL GUESTS AND NOT THE REST OF THE RESORT RESIDENTS. PLEASE INCLUDE IN YOUR EIS AN ANALYSIS OF HAPUNA BEACH USE BY A FULLY BOOKED HOTEL (APPROX. 700 PEOPLE) PLUS A FULLY DEVELOPED RESIDENTIAL NEIGHBORHOOD (APPROX. 1600 PEOPLE). PLEASE DO THIS ANALYSIS SEPERATELY FROM THE OVERALL IMPACT OF ALL DEVELOPMENT IN N. & S. KOHALA AND N.KONA (AS REQUESTED ABOVE) SO THAT THE PUBLIC AND REVIEWING AGENCIES CAN HAVE A CLEAR UNDERSTANDING OF THE IMPACT OF THE HAPUNA BEACH RESORT ON HAPUNA BEACH WITHOUT THE ADDITIONAL PLANNED DEVELOPMENT IN W.HAWAII.

PLEASE INCLUDE IN YOUR EIS YOUR PROJECTED CUMULATIVE IMPACT ON HAPUNA BEACH AND KAUNAO BEACH IN 13 YEARS IN THE YEAR 2000 SHOULD ALL OF THE PRESENTLY PLANNED AND PROPOSED DEVELOPMENTS TAKE PLACE IN N & S. KOHALA AND N.KONA. THIS WOULD INCLUDE THE CONSTANT VISITOR POPULATION OF 12-21,000 PEOPLE AS WELL AS THE INCREASED WORKFORCE POPULATION OF 15,000 PEOPLE FOR 18,000 ALLOWABLE UNITS IN THE 3 MAJOR RESORT AREAS IN S.KOHALA, THE 6 ADDITIONAL RESORT DEVELOPMENTS BETWEEN MAIKOLOA AND KAILUA APPLIED FOR IN THE CURRENT GENERAL PLAN UPDATE ACCOUNTING FOR OVER 10,000 UNITS, THE PLANNED MAUKONA DEVELOPMENT COMPRISING AN ADDITIONAL 5,200 UNITS, AS WELL AS THE PROJECTED DEVELOPMENT OF THE N.KONA AREA WHICH SOME STUDIES HAVE INDICATED MAY BE COMPARABLE TO THAT OF S. KOHALA.

7. THE DEBASEMENT OF HAWAII ISLAND AS A VISITOR DESTINATION WHEN ONE HOTEL DOMINATES OUR ISLAND'S BEST COASTAL RECREATIONAL RESOURCE.

PLEASE DISCUSS IN YOUR EIS THE POTENTIAL DEBASEMENT OF HAWAII ISLAND AS A VISITOR DESTINATION IF ONE HOTEL AND ONE RESORT IS ALLOWED TO DOMINATE OUR ISLAND'S FOREMOST BEACH WHICH IS USED NOT ONLY BY MORE RESIDENTS BUT BY MORE ISLAND VISITORS AS WELL. WITH SO FEW BEACHES AND SO MANY PEOPLE IS IT IN THE PUBLIC INTEREST FOR ONE HOTEL TO TAKE ADVANTAGE OF OUR LIMITED COASTAL RECREATIONAL RESOURCES AT THE EXPENSE OF THE OTHER DEVELOPMENTS, ESPECIALLY WHEN VIABLE OPTIONS EXIST?

THIS ISSUE IS FURTHER EXACERBATED BY THE FACT THAT THE SAME DEVELOPER, MAUNA KEA PROPERTIES, HAS ALREADY "PRIVATIZED" OUR ISLAND'S 2ND BEST BEACH.

8. VERY LIMITED, RESTRICTED AND CONTROLLED PUBLIC SHORELINE ACCESS TO KAUNADA BAY AT THE WESTIN MAUNA KEA HOTEL

PUBLIC SHORELINE ACCESS FROM QUEEN KAAMUHAMU HWY IS PRESENTLY RESTRICTED BY FREE PUBLIC PARKING FOR 10 VEHICLES AT ANY ONE TIME. AS A RESULT FEW LOCAL RESIDENTS AND FEW ISLAND VISITORS EVER HAVE THE BENEFIT OF USING THE OUTSTANDING PUBLIC BEACH AT KAUNADA. THE NET RESULT OF THIS PARKING LIMITATION IS THAT KAUNADA IS FOR ALL PRACTICAL PURPOSES A PRIVATE ENCLAVE FOR GUESTS OF THE WESTIN MAUNA KEA. FURTHERMORE, WITH THE ADVENT OF THE HAPUNA BEACH RESORT IT IS CERTAIN THAT THESE 10 SPACES WILL BE DOMINATED BY THE APPROXIMATELY 1600 HAPUNA BEACH RESORT RESIDENTS.

PLEASE DISCUSS IN YOUR EIS HOW THE SEVERELY LIMITED PUBLIC RECREATIONAL USE OF KAUNADA BAY MAY BE RESOLVED BY PROVIDING ADDITIONAL FREE PUBLIC PARKING AND GREATER PUBLIC ACCESS TO KAUNADA BAY BY MEANS OF ADDITIONAL PUBLIC PARKING STALLS AND BEACH ACCESS FROM THE NORTH END OF THE HAPUNA BEACH RESORT (WHICH ENDS A FEW HUNDRED FEET FROM THE SOUTH END OF KAUNADA BEACH). THE ISSUE OF PARKING AND ACCESS TO KAUNADA BEACH WAS NOT MENTIONED IN YOUR ASSESSMENT OF THE IMPACTS OF THE HAPUNA BEACH RESORT.

FAILURE TO RESOLVE THE PROBLEM OF PARKING AND ACCESS TO KAUNADA BEACH WILL EXACERBATE AN ALREADY INTOLERABLE CONDITION. MKP HAS VIRTUALLY "PRIVATIZED" HAWAII ISLAND'S 2ND BEST WHITE SAND BEACH. WITH THE ADVENT OF A HOTEL AT HAPUNA THEY WILL ALSO DOMINATE OUR ISLAND'S FIRST AND FOREMOST WHITE SAND BEACH AS WELL.

PLEASE INCLUDE IN YOUR EIS YOUR EVALUATION OF THE USER IMPACT OF THE HAPUNA BEACH RESORT ON HAPUNA STATE PARK IF THE STATE PARK IS EXPANDED TO WAILEA BAY AND IF IT IS NOT.

ALSO PLEASE INCLUDE IN YOUR EIS THE IMPACT OF THIS POPULATION GROWTH ON PARKING AT HAPUNA BEACH STATE PARK WHICH PRESENTLY COMPRISE THE EXISTING 225 STALLS PLUS THE ADDITIONAL 40 STALLS THAT WERE REQUIRED BY THE PLANNING COMMISSION IN CONJUNCTION WITH THE HAPUNA BEACH RESORT.

TO BE REALISTIC, SINCE HAPUNA BEACH ATTRACTS USERS FROM ALL SECTIONS OF HAWAII ISLAND, PLEASE INCLUDE IN YOUR EIS THE IMPACT ON HAPUNA OF THE PROJECTED INCREASE IN POPULATION OF THE REST OF THE ISLAND INCLUDING S.KONA, HILO, HAMAHAU, KA'U AND PUNA.

ALSO PLEASE INCLUDE IN YOUR EIS THE LIKELY IMPACT ON HAPUNA BEACH OF YOUR PLANNED RESORT AT NEARBY SPENCER BEACH COUNTY PARK GIVING DETAILS AS TO ITS PROXIMITY TO SPENCER BEACH PARK, AS WELL AS THE NUMBER OF HOTELS, HOTEL UNITS, AND RESIDENTIAL UNITS IN THE LAST PLAN.

FURTHERMORE, THE USER IMPACT STUDY USED IN THE ORIGINAL ENVIRONMENTAL ASSESSMENT AND CONTESTED CASE HEARING IS MISLEADING AND WORTHLESS AS ITS DATA FOR HAPUNA BEACH USAGE IS BASED ON USAGE DURING THE MONTH FOLLOWING THE MONTH LONG UNITED AIRLINES STRIKE WHICH CRIPPLED HAWAII'S VISITOR INDUSTRY AND RESULTED IN SIGNIFICANTLY LOWER BEACH USAGE DURING THE FOLLOWING MONTHS. PLEASE INCLUDE IN YOUR EIS A MORE ACCURATE AND UPDATED USER STUDY.

6. CLASH BETWEEN LOCAL USERS AND HAPUNA RESORT GUESTS AND RESIDENTS AS HAPUNA BECOMES OVERCROWDED AS A RESULT OF HAPUNA RESORT USAGE.

PLEASE DISCUSS IN YOUR EIS HOW YEARS FROM NOW YOU WILL DEAL WITH THE INEVITABLE CLASH BETWEEN LOCAL RESIDENTS AND HAPUNA HOTEL GUESTS WHEN THE HAPUNA BEACH RESORT RESIDENTS AND HOTEL GUESTS DOMINATE HAPUNA, ESPECIALLY THE NORTH THIRD OF THE BEACH, AND LOCAL RESIDENTS FIND THEIR ISLAND'S BEST BEACH TOO CROWDED FOR THEIR USE.

9. THE IMPACT OF THE HAPUNA BEACH RESORT, ESPECIALLY A HOTEL AT HAPUNA ON THE LIMITED COASTAL RECREATIONAL RESOURCES OF HAWAII ISLAND.

HAWAII ISLAND IS THE BIGGEST ISLAND IN THE STATE OF HAWAII YET BECAUSE IT IS THE YOUNGEST, HAS THE FINEST BEACHES.

PLEASE DETAIL IN YOUR EIS THE BEACHES OF N.KONA AND KOHALA GIVING THE SIZE OF THE BEACH, THE NATURE OF THE PUBLIC ACCESS, THE FACILITIES AVAILABLE AND THE SIZE OF THE RESORT DEVELOPMENTS PLANNED AT THESE BEACHES.  
PLEASE ADDRESS IN YOUR EIS THE ADEQUACY/INADEQUACY OF THE SUPPLY OF SHORELINE PARKS IN WEST HAWAII.

10. RETAINING ALL EXISTING VEGETATION WITHIN THE 40 FOOT SHORELINE SETBACK AREA ABUTTING HAPUNA BEACH IN ORDER TO MAINTAIN THE NATURAL BEAUTY OF HAPUNA AND THAT HAPUNA BEACH DOESN'T BECOME AN EXTENSION OF THE HOTEL

MKP'S PLAN TO "CLEAR, GRADE, GRUB, AND PLANT" AND REMOVE EXISTING TREES AND TRIM OTHERS WITHIN THE 40' SETBACK FROM THE SHORELINE ABUTTING HAPUNA BEACH WILL SERVE THEIR INTERESTS BUT CERTAINLY NOT THAT OF THE PUBLIC. WHAT THEY CALL "PROVIDING A VISUAL TRANSITION BETWEEN DEVELOPED SITES AND THE NATURAL SHORELINE" WILL OPEN THE PUBLIC'S VIEW TO THE POOL DECK, THE POOL, AND THE HOTEL STRUCTURES THAT START AT 20' ELEVATION. IT WILL ALSO TEND TO MAKE THE NORTH END OF HAPUNA APPEAR TO BE PART OF THE HOTEL FACILITIES RATHER THAN THE PUBLIC BEACH THAT IT IS BY EXTENDING THE HOTEL LANDSCAPING RIGHT UP TO THE EDGE OF THE BEACH. MKP IS NOTORIOUS FOR "PRIVATIZING" THE PUBLIC BEACH AT KAUNADA FRONTING THE WESTIN MAUNA KEA WHICH IS COVERED WITH UPTO 200 BEACH CHAIRS EARLY IN THE MORNING BEFORE ANY HOTEL GUESTS ARRIVE AT THE BEACH.

WHAT MKP CALLS "UNCONTROLLED VEGETATIVE GROWTH" IS IN REALITY PART OF THE NATURAL BEAUTY THAT MAKES HAPUNA THE FANTASTIC PLACE IT IS.

IF ANYTHING, SHOULD THE PLANNING COMMISSION GRANT THE SHORELINE SETBACK VARIANCE, IT SHOULD REQUIRE NOT ONLY THAT THE VEGETATION WITHIN THE SETBACK ABUTTING HAPUNA BEACH BE LEFT INTACT BUT THAT ALL EXISTING VEGETATION MAUKA OF THE SETBACK THAT WOULD SERVE TO OBSTRUCT PUBLIC VIEW OF THE HOTEL STRUCTURE, BE RETAINED. THIS ALSO PERTAINS TO THE "CLUEHOUSE" WHICH IS MAKAI OF THE HOTEL AND THE MOST VISIBLE STRUCTURE FROM VIRTUALLY ALL OF HAPUNA BEACH.

PLEASE DISCUSS IN YOUR EIS THE FEASIBILITY OF LEAVING THE 40' SHORELINE SETBACK ABUTTING HAPUNA BEACH AND THE "LUEHOUSE" INTACT IN LIGHT OF YOUR STATEMENT TO THE PLANNING COMMISSION THAT A SHORELINE SETBACK VARIANCE IS NOT NECESSARY FOR THE SUCCESS OF THE RESORT.

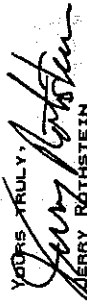
THERE IS NO OBJECTION TO MKP'S DESIRED ALTERATIONS

### 11. EMPLOYEE HOUSING

PLEASE INCLUDE IN YOUR EIS INFORMATIONS AS TO THE REQUIREMENTS OF THE LUC AND THE COUNTY COUNCIL REGARDING EMPLOYEE HOUSING INCLUDING AN UPDATE AS TO THE STATUS OF ITS IMPLEMENTATION.

### 12. LACK OF ADEQUATE FRESH WATER

THE COUNTY DEPT OF WATER INDICATED IN A LETTER THAT THE AMOUNT OF WATER ALLOTTED TO MKP'S RESORTS WERE LESS THAN THEIR ANTICIPATED WATER NEEDS. PLEASE ADDRESS IN YOUR EIS THIS INSUFFICIENCY OF FRESH WATER.

YOURS TRULY,  
  
JERRY ROTHSTEIN  
SAVE HAPUNA INITIATIVE PETITIONER'S COMMITTEE  
PO Box 1544  
KAILUA-KONA HAWAII 96745  
329-1568



July 21, 1987  
87-1500

Mr. Jerry Rothstein  
Save Hapuna Initiative Petition  
Petitioner's Committee  
P.O. Box 1544  
Kailua-Kona, Hawaii 96745

Dear Mr. Rothstein:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of January 5, 1987, commenting on the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and other Save Hapuna Initiative Petition Petitioner's Committee members spent reviewing the materials. We recognize that various areas of concern need to be examined more fully and we intend to do so in the EIS, based on studies which are being prepared to address the potential impacts of the project. Specific questions, issues and topics discussed in your letter, in their order of appearance, have been reviewed as follows.

1. "Hapuna and Kaunaoa Bay pollution." A study of the potential impact of fertilizer and herbicide use at the proposed resort has been conducted by a soil scientist and an agronomist. Their work includes an analysis of the drainage patterns at and in the immediate vicinity of the proposed resort. The results of this study as well as those of an offshore marine survey will be reported in the EIS.

2. "Alternate hotel sites." Alternatives to the proposed action have been examined, including alternate hotel siting. These alternatives will be discussed in the EIS, including reasons why they were rejected in favor of the proposed project.

3. "Viewplane." The visual impacts of the proposed hotel will be discussed in the EIS, including impacts on views from the beach and the impacts of replacing some of the existing vegetation with landscaping.

4. "The likelihood/unlikelihood of expanding Hapuna Beach State Park to Wailea Bay." The EIS will contain a section discussing the potential social impacts of the proposed South Kohala Resort, as well as other developments in the West Hawaii region, on the use of Hapuna Beach. Mitigation measures would include further development of Hapuna Beach State Park, including ultimate expansion to "Beach 69" at Wailea Bay.

The acquisition of Wailea Bay lots is within the purview of the State of Hawaii and whether the cost of obtaining these lots is a reasonable public expenditure is best decided by the State. It would logically also be the State's task to estimate the price of the Wailea Bay lots as well as their condemnation value. Given the uncertainty of "Beach 69" development, the EIS will consider the impact of the proposed development on existing beaches without the Wailea Bay beach.

Mr. Jerry Rothstein  
July 21, 1987 - page 2

According to State Department of Land and Natural Resources (DLNR) personnel, DLNR is preparing an inventory of West Hawaii beach park sites with good recreational potential. Such sites, if developed, would provide additional shoreline recreational facilities for the region. We have been informed that the staff report will be available shortly.

5. "Expanding population and its impact on Hapuna and Kaunaoa Beaches." Hapuna beach usage and Kaunaoa beach usage were observed during a two-week period encompassing Christmas and New Year's. Hourly counts were taken during this "peak period," when hotels were fully occupied and island students were on vacation. The results of this updated study will be included in the EIS. A regional socioeconomic impact analysis has been prepared for the EIS and addresses the impact of South Kohala Resort development and regional development on the two beaches. This also will be included in the EIS.

6. "Clash between local users and Hapuna Resort guests and residents as Hapuna becomes overcrowded as a result of Hapuna Resort usage." The EIS will contain a section on qualitative social impacts due to resort development, including forces for social change and statistical indicators of community cohesion. It is expected that Hapuna beach, as well as other island recreational amenities, will become more crowded as a result of resort development at South Kohala Resort and at other Big Island resorts. Mitigation measures will be proposed in the EIS to reduce potential conflicts between visitors and residents.

7. "The debasement of Hawaii Island as a visitor destination when one hotel dominates our island's best coastal recreational resource." Whether "debasement of Hawaii Island as a visitor destination" will occur due to the development of the 350-room South Kohala Resort hotel on property fronting the northern portion of Hapuna beach is a debatable point. To assess impact, either negative or positive, increased usage of Hapuna beach as a result of South Kohala Resort development will be discussed in the EIS.

8. "Very Limited, restricted and controlled public shoreline access to Kaunaoa Bay at the Westin Mauna Kea Hotel." South Kohala Resort will be a separate destination resort and will be marketed separately from Mauna Kea Resort. The EIS will focus on potential impacts due to the development of South Kohala Resort, not on Mauna Kea Resort operations and policies, including those pertaining to access to Kaunaoa beach. The use of Kaunaoa beach will be discussed as it pertains to the analysis of impacts from South Kohala Resort development.

9. "The impact of the Hapuna Beach Resort, especially a hotel at Hapuna on the limited coastal recreational resources of Hawaii Island." The 1985 "State Comprehensive Outdoor Recreation Plan," prepared by the State Department of Land and Natural Resources, contains an inventory of North Kona and Kohala beaches and parks. As mentioned previously under 4 above, DLNR is also preparing an inventory of West Hawaii beach park sites with good recreational potential, which should be available shortly. Please refer to these documents for a comprehensive view of West Hawaii coastal recreational facilities. The EIS will focus on West Hawaii beach facilities as they pertain to potential impacts due to South Kohala Resort development.

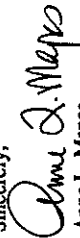
10. "Retaining all existing vegetation within the 40-foot shoreline setback area abutting Hapuna beach in order to maintain the natural beauty of Hapuna and that Hapuna beach doesn't become an extension of the hotel." The improvements proposed for the 40-foot setback area, including trimming existing vegetation and the introduction of supplementary plant materials, will be discussed in the EIS.

Mr. Jerry Rothstein  
July 21, 1987 - page 3

11. "Employee housing." An analysis of employee housing needs has been prepared within the context of the overall socioeconomic impact analysis for the EIS. State and County housing conditions which must be met will be outlined.
12. "Lack of adequate fresh water." Potable water requirements for the proposed South Kohala Resort are the subject of ongoing discussions between Mauna Kea Properties and the County Department of Water Supply. These requirements, as well as water source, will be discussed in the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment at that time.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

LEON A. THEVENIN  
SOUTH KOHALA RESORT ADVISORY COMMITTEE  
104 PUAKO BEACH DRIVE  
KANUELA, HAWAII 96743

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Re: EIS - SOUTH KOHALA RESORT

Dear Anne:

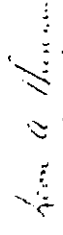
Thank you for the invitation for help in the preparation of the above document.

I am circulating your letter to our 23 members who represent business, labor, community associations, civic minded individuals and others in our District. I have asked them to respond by December 31st so I can forward our collective thoughts early in 1987.

I personally believe the data presented for our perusal is well documented by facts. Our members represent over a thousand years of residency on this island which should make our comments valuable.

With best wishes for Christmas and my personal best to Jim Bell.

Sincerely,

  
Leon A. Thevenin  
Chairman Pro Tem

cc: Mauna Kea Properties  
Patti Cook

Ms. Anne L. Mapes  
January 5, 1987  
Page 2

LEON A. THEVENIN  
104 Puako Drive  
Kamuela, Hawaii 96743

January 5, 1987

Ms. Anne L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Re: EIS - South Kohala Resort

Dear Ms. Mapes:

We have reviewed the EIS prep notice and Environmental Assessment and are prepared to comment. As you may recall, our Advisory Committee has representatives from labor, business, community associations, Hawaiian civic groups as well as individuals island wide. Our purpose is to provide community input to Mauna Kea Properties on the proposed South Kohala Resort.

Our Advisory Committee has gone on record individually and collectively in support of the self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Key 6-2-02: 12 and 13, 6-6-02: 37 and 38, and 6-2-01: portions of 51 and 52.

We also subscribe to protecting our environment.

Our members recommend that the project proceed. We feel Mauna Kea Properties has provided documented facts supporting the project's environmental integrity. Opposition based on alleged environmental deterioration is not founded on fact.

Further, we believe that the public's use and enjoyment of Hapuna beach will be enhanced by the development of the proposed resort. We are concerned that public use, access and enjoyment of Hapuna beach as we know it today -- especially of the northern portion of the beach -- are seriously undermined by poor

administration and supervision by the responsible agency, which also oversees care and use of the adjoining Hapuna Beach State Park.

Too often, nonconforming park activities are "permitted" due to the complete absence of effective supervision on the beach fronting the proposed South Kohala Resort. No control is presently being made over human behavior, which is often misbehavior.

Studies prepared as part of the previous Environmental Assessment indicate that no harm will come to Hapuna beach by the proposed resort. We therefore would point out the development's positive effects on the environment rather than dwell on imaginary harm.

Some of our members feel that the proposed resort's operators should use discretion in not setting out beach chairs, etc., prior to the arrival of guests. Also, private property lines should be well marked by landscaping. These concerns have been responded to satisfactorily in the form of conditions set forth in the previously issued Special Management Area (SMA) use permits.

As a property owner in this area a decade before the development of the Mauna Kea Beach Hotel, I am acquainted with the region's water needs and demands, especially in times of drought when use of domestic water is curtailed: no watering of lawns, no car washing, no boat washing, etc.

While a major portion of the water required for this proposed resort is already accounted for, there appears to be an insufficient supply to fulfill all of needs of the proposed development. Therefore, the developer has committed to undertake additional water resource development at Lalaimilo or other nearby water sources to satisfy the needs of the development. I submit that this subject command close attention and coordination between the County and developer to arrive at a definite specific solution.

I would further add that I do not think the solution to additional water resource development lies in transporting water from North Kohala to South Kohala, as is currently being proposed by the County Department of Water Supply.

Ms. Anne L. Mapes  
January 5, 1987  
Page 4

We are also concerned about the State plan to develop a brackish water well at the 500-foot elevation, which would be used to mix with potable water, thereby increasing the existing supply to about 4 1/2 million gallons per day. Upon the advice of a very competent medical authority, we are concerned over the possibility of harmful effects of salt in drinking water for some people.

One possible and very acceptable solution would be to follow Mauna Lani's suit. As you know, Mauna Lani resolved their water shortfall by drilling another well at Lalaimilo.

Some of the water shortages confronting Waimea will be lessened by the new 50 MG reservoir. However, this is only storage with no source development. Securing an adequate water supply will continue to be very serious concern for years to come with anticipated large increases in consumption by new arrivals in the district. This problem affects all of South Kohala.

This writer has done agricultural research on this island for over 36 years. In addition, I was an advisor to the Dean of Tropical Agriculture at the University of Hawaii. I can find no justification for claims of contaminating the public beach or ocean by pesticides. It has not been called to my attention as occurring elsewhere in Hawaii. The arid climate is not conducive to runoff of materials in such minor use, in this case, insecticides or herbicides. Resort employees are those most closely concerned, and they are protected by label restrictions on use as determined by the Pure Food, Drug and Cosmetics Act.

We feel specific attention must be given employee housing. This subject has already been addressed as a condition of approval of Mauna Kea Properties' State Land Use entitlements

On this subject we favor expansion of existing bedroom communities in North Kohala, Kawaihae, Hamakua, Waimea and Waikoloa. Business groups as well as the County should coordinate this. We believe that housing should be a joint public/private sector undertaking.

Regarding the educational impact of the proposed development, we wish to encourage consideration of a Waimea public high school to alleviate anticipated overcrowding due to a growth in student population as a result of this and other new resort developments planned on the Kohala Coast. In time, resort employee training could be added to the curriculum.

Our group represents over a 1,000 years of residency on this island. From this outlook we recognize and are grateful for the contributions made to date by Mauna Kea Properties through the Westin Mauna Kea hotel, its golf course and residential developments. Their track record is such that others like the Sheraton and Mauna Lani were built with this as a standard of excellence.

This project is good for Hawaii and its people and should proceed. A Special Management Area use permit and Shoreline Setback Variance should be expeditiously granted.

Sincerely,

*Leon A. Thevenin*  
Leon A. Thevenin  
Chairman Pro Tem  
South Kohala Resort Advisory  
Committee

June 5, 1987  
87-1206

December 16, 1986  
86-2253

Mr. Leon A. Thevenin  
Chairman Pro Tem  
South Kohala Resort Advisory Committee  
104 Puako Drive  
Kamuela, Hawaii 96743

The Honorable John Waihee  
Office of the Governor  
State Capitol  
Honolulu, Hawaii 96813

Dear Mr. Thevenin:

Dear Governor Waihee:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Thank you for your letter of January 5, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time the Advisory Committee members spent reviewing the project. Your comments will be useful in preparing the EIS and the Draft report will address the concerns raised in your letter.

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-02:12 & 13, 6-6-02:37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

An Environmental Impact Statement Preparation Notice (EISPN) announcing the intention to prepare an EIS in accordance with Chapter 343, Hawaii Revised Statutes, was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. Copies of the EISPN and the Environmental Assessment (EA) on which it was based are attached to this letter for your information. Copies of the EISPN and EA have also been sent to your department heads for their review and comment.

Sincerely,

*Anne L. Mapes*

Anne L. Mapes

ALM:lif

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

If all goes as planned, the EIS will be available in April 1987, at which time the document will be circulated for public review and comment.

Should you or your staff have any questions regarding the South Kohala Resort project, please do not hesitate to contact us.

Sincerely,

Anne L. Mapes

ALM:lif  
Attachment

RECEIVED

JAN 7 1987

BELT, COLLINS & ASSOCIATES

BELT COLLINS & ASSOCIATES  
Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 749071 • Fax (808) 536-3119  
Hawaii • Singapore • Australia • Cambodia • Hong Kong • Japan

EXECUTIVE CHAMBERS  
HONOLULU

JOHN WAIHEE  
GOVERNOR

January 5, 1987

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

Thank you for your letter of December 16, 1986, to Governor Waihee, regarding the environmental impact statement preparation notice for the proposed Mauna Kea Properties, Inc. resort community at South Kohala, Hawaii. We have shared your letter with the appropriate state agencies.

Sincerely,

*Joshua C. Agsalud*  
Joshua C. Agsalud  
Administrative Director

Mr. Joshua C. Agsalud  
Administrative Director  
Office of the Governor  
State Capitol  
Honolulu, Hawaii 96813

Dear Mr. Agsalud:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

We have received your letter of January 5, 1987 acknowledging receipt of the EIS Preparation Notice and Environmental Assessment for the above project. Thank you for sharing our letter with the appropriate state agencies.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Mr. Francis M. Hatanaka  
Page two

December 16, 1986  
86-2249

December 16, 1986  
86-2249

Mr. Francis M. Hatanaka, Superintendent  
Department of Education  
State of Hawaii  
P.O. Box 2360  
Honolulu, Hawaii 96804

Dear Mr. Hatanaka:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-02:12 & 13, 6-6-02:37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

On November 24, 1986, Mauna Kea Properties submitted a Special Management Area Use permit petition and a Shoreline Setback Variance application to the County of Hawaii Planning Department for the proposed project. The Planning Department determined that, due to the Shoreline Setback Variance request, the applicant shall prepare an Environmental Impact Statement (EIS) in accordance with Chapter 343, Hawaii Revised Statutes (HRS). An EIS Preparation Notice announcing this determination was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. A copy of the EISPN and the environmental assessment is enclosed.

We request that you or your organization assist us in preparing the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special knowledge, or interest. You could help us address those issues that are of greatest concern by indicating in writing the specific questions, issues, and topics you believe are important and the reasons why they are.

In addition to identifying any particular concerns you may have regarding the proposed development, we would appreciate answers to the following questions:

1. Which public elementary, intermediate, and secondary schools would serve students from the residential development within the proposed project?
2. What is the current enrollment and design capacity for the above schools?
3. Are there plans to expand these facilities? What is the projected enrollment in the next 5, 10 and 15 years?

4. What are the student generation factors (by grade level) for the relatively high-priced resort residential units? What are they for average-priced residential units on the Island of Hawaii?

The EIS Regulations stipulate that upon publication of a preparation notice, agencies, groups or individuals have a period of 30 days to make written comments regarding the environmental effects of the proposed project. We hope you will be able to respond within this time period. If all goes as planned, the EIS will be available in April 1987. At that time, the document will be circulated for public review and comment.

Thank you for your cooperation. Should you have any questions, please call me at 521-5361.

Sincerely,

Anne L. Mapes

ALM:lf  
Enclosure



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P. O. BOX 2360  
HONOLULU, HAWAII 96801

OFFICE OF THE SUPERINTENDENT

December 31, 1986

Margaret Oda  
Acting SUPERINTENDENT

RECEIVED  
JAN 8 1987

BELT, COLLINS & ASSOCIATES

Ms. Anne L. Mapes  
Page no. 2  
December 31, 1986

IV. Student Generation Factor Per 100 Resort Type Units

|                     | K-9 | 10-12 |
|---------------------|-----|-------|
| Single Family Units | .10 | .05   |
| Condominiums        | .02 | .01   |

\* Unadjusted for planned transfer of grade 9 students to Honokaa School in September, 1987.

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

SUBJECT: EIS Preparation Notice  
Proposed South Kohala Resort

The following information on the subject matter is being provided per your request of December 16, 1986.

I. Students Projected

| School              | Grades | Students |
|---------------------|--------|----------|
| Waimea Elem.-Inter. | K-9    | 20-30    |
| Honokaa High        | 10-12  | 10-20    |

II. Enrollment

| Year             | Waimea School*<br>K-9 | Honokaa School*<br>K-12 |
|------------------|-----------------------|-------------------------|
| 1986 - Actual    | 899                   | 1085                    |
| 1990 - Projected | 1042                  | 1167                    |
| 2006 - Projected | 1230                  | 1410                    |

III. Design Capacity

| Year | Waimea School<br>K-9 | Honokaa School<br>K-12 |
|------|----------------------|------------------------|
| 1986 | 922                  | 1260                   |

Planned Construction

Waimea Elem.-Inter. - 4 Classroom Buildings (1988)  
Honokaa School - 6 Classroom Buildings (1989)

We would appreciate being kept up-to-date on the development so that we may be able to budget additional needs on a timely basis.

Should you have any questions, please contact Mr. Minoru Kouye at 737-4743.

Sincerely,

*Margaret Y. Oda*

Margaret Y. Oda  
Acting Superintendent

MYO:dk

cc Mr. Albert Lono Lyman  
OBS



June 5, 1987  
87-1203

December 16, 1986  
86-2250

Mr. Charles T. Toguchi  
Superintendent of Education  
Department of Education  
State of Hawaii  
P.O. Box 2360  
Honolulu, Hawaii 96804

Dear Mr. Toguchi:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your department's letter of December 31, 1986 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the material. The information provided concerning public school enrollment and educational facilities will be helpful in preparing the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lif

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Mr. Susumu Ono, Chairman  
Board of Natural Resources  
Department of Land and Natural Resources  
State of Hawaii  
P.O. Box 621  
Honolulu, Hawaii 96809

Dear Mr. Ono:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-02:12 & 13, 6-6-02:37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

On November 24, 1986, Mauna Kea Properties submitted a Special Management Area Use permit petition and a Shoreline Setback Variance application to the County of Hawaii Planning Department for the proposed project. The Planning Department determined that, due to the Shoreline Setback Variance request, the applicant shall prepare an Environmental Impact Statement (EIS) in accordance with Chapter 343, Hawaii Revised Statutes (HRS). An EIS Preparation Notice announcing this determination was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. A copy of the EISPN and the environmental assessment is enclosed.

We request that you or your organization assist us in preparing the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special knowledge, or interest. You could help us address those issues that are of greatest concern by indicating in writing the specific questions, issues, and topics you believe are important and the reasons why they are.

In addition to identifying any particular concerns you may have regarding the proposed development, we would appreciate answers to the following questions:

1. The proposed development site is adjacent to the Hapuna Beach State Park. Do you foresee any potential conflicts between the proposed resort and residential uses and the public's use of the beach park? If so, please describe them and indicate ways in which conflicts may be avoided.
2. What are the State's plans for improvements to Hapuna Beach State Park and what is the implementation schedule?

Mr. Susumu Ono  
Page two

December 16, 1986  
86-2250

3. What is the status of implementation of the long-range master plan for improvements at Hapuna Beach State Park which was prepared in 1970?
4. Does the State have plans to develop other recreational facilities in the West Hawaii region? If so, please describe these facilities and give a timetable for development.

The EIS Regulations stipulate that upon publication of a preparation notice, agencies, groups or individuals have a period of 30 days to make written comments regarding the environmental effects of the proposed project. We hope you will be able to respond within this time period. If all goes as planned, the EIS will be available in April 1987. At that time, the document will be circulated for public review and comment.

Thank you for your cooperation. Should you have any questions, please call me at 521-5361.

Sincerely,

Anne L. Mapes

ALM:lf  
Enclosure

RECEIVED  
FEB 2 1987

JOHN WAIHEE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 821  
HONOLULU, HAWAII 96809

WILLIAM W. PAGE  
DIRECTOR OF LAND & NATURAL RESOURCES  
Libert Landgraf  
DIRECTOR OF THE DIVISION

DIVISION OF RECREATION  
PROGRAM  
ACQUATIC RESOURCES  
GENERALIZATION AND  
CONSERVATION  
FACILITIES  
PLANNING AND MGMT.  
SITES MANAGEMENT  
WATER AND LAND QUALITY

FEB 19 1987

DOC. NO.: 2376B

Ms. Ann L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

SUBJECT: Comments on Environmental Impact Statement (EIS)  
Preparation Notice  
South Kohala Resort (Mauna Kea Properties)  
Ouli, South Kohala, Hawaii  
TMK: 6-2-02: 12, 13; 6-6-02: 37, 38

We have reviewed the EIS Preparation Notice for the subject proposal and offer the following comments:

Aquatic Resources Concerns

At the "Nanea Kai" conference on September 5, 1985, a representative of the State Department of Transportation described numerous complaints about certain West Hawaii developments which meet minimum legal requirements for access locations and failing to allow parking. The developer should provide reasonably convenient public access to, and reasonable amounts of free public parking near the shoreline for fishermen and other recreational users.

The recreational values of the beach and park resources should be preserved.

To safeguard the quality of the coastal environment which attracts public use, consideration should be given to possible impacts of drainage water, wastewater disposal and nutrient enrichment. Since Hapuna was the subject of considerable public controversy over potential use conflicts which were well described in the news media in late 1985, the developer should declare its intent and plans regarding commercial activities to be proposed on public beach lands (such as charging customers to windsurf, jet ski, participate in snorkel or boat tours, etc.), and appropriately describe how use conflicts are to be mitigated.

All shoreline improvements and/or beach modifications should be adequately described in the Draft Environmental Impact Statement (DEIS) and our Department should have the opportunity to review all proposed activities within our Department's jurisdiction that may restrict, impede, hamper, limit, hinder, obstruct, curb, retard or discourage the present public's use of State shoreline land in this vicinity for fishing or other recreational use.

Further, mitigative measures to prevent contamination of coastal waters and resources by eroded soils, construction materials and debris, pesticides, herbicides, and petroleum products should be described in the DEIS.

Historic Sites Concerns

We are somewhat concerned with the historic preservation statements in this EA. The EA indicates that the historic preservation review process has been concluded (p. 9-10, 15) with (1) the significance of all the historic sites established, (2) the mitigation of all sites recommended for data recovery concluded, and (3) the sites to be preserved having been identified.

The last time we commented on project-wide matters for the South Kohala Resort was in September 1985, when we reviewed multiple county-level applications. At that time, we noted concerns with prior findings for 6-2-02: 12, and we were told a new survey was being done by Paul H. Rosendahl, Inc. (PHRI). We have never seen a report documenting this survey's findings, so we have yet to evaluate the findings on numbers of sites, significance and mitigation plans for this parcel. Also, in 1985, we had questions about significance assessments and about mitigation plans for the other areas. We have yet to receive a response regarding these questions.

We would recommend that the applicant or his planners supply our Historic Sites Section with a copy of the PHRI 1985 report and then meet with our Section to answer our 1985 questions. We would recommend that this be done prior to the completion of the Draft EIS, in order that our concerns be resolved at an early point in time.

Recreation Concerns

The subject project adjoins Hapuna Beach State Recreation Area and shares a position of the beach. As next door neighbors we have identified the following concerns to be addressed in the environmental impact statement:

Will the property boundary be fenced and/or screened with plantings? If so, what type of fence and plantings will be used?

Will public access between the park and the resort area be provided other than on the beach itself? What resort facilities and grounds, if any will be open to the general public?

How will the beach fronting the subject property be managed? Will the sand be cleaner? Will lifeguards be provided?

What is the source and location of both potable and irrigation water supplies? Currently the parks potable water comes from a water line which involves the subject property. We have a separate but rather brackish irrigation water supply system.

How will drainage be taken care of particularly where it could impact State-owned land, Hapuna Beach and nearshore waters?

There are no State Park plans to improve the park area adjoining the subject property. Park expansion is anticipated on the south side of the existing developed and/or at Wailea Bay. The 1970 long-range master plan is being followed in a very general way with planned campgrounds and additional picnicking areas but the location of these facilities may change and the total park acreage is expected to be smaller. Currently while there are no plans to develop other State parks in the West Hawaii region, the park potential of the State-owned shoreline areas is recognized.

Water and Land Development Concerns

The EIS preparation notice and subsequent EIS will support the developer's application for a Shoreline Setback Variance. As such, the Preparation Notice appears to address only the activities and impacts occurring within the 40-foot shoreline setback.

Clearing, grubbing, grading, landscaping and installation of an irrigation system will occur within the 40-foot shoreline setback. As such, the DEIS should clearly indicate specific mitigation measures to minimize potential detrimental impacts to the shoreline environment resulting from construction activities.

We note on page 17 under Item VI, "Irreversible and Irrecoverable Commitment of Resources", that water resources will be committed for the project development. The DEIS should clearly state the anticipated demand for water and the developer's proposed sources for providing potable and non-potable water.

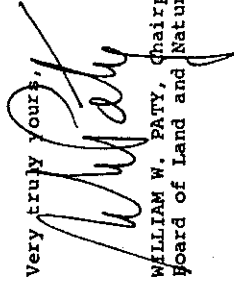
Wildlife Concerns

Specifics to be addressed in preparing your EIS should include the following:

1. Provisions for public access and parking along a designated route to be the shoreline through the development.
2. Perpetuation of coastal trails for uninterrupted public use.
3. Lighting of towers and high buildings to minimize bird collisions. The standard statement is as follows:
  - a. Locate lights at the top of each tower or pole;
  - b. Lights shall be shielded to prevent glare above the horizontal plane;
  - c. "Cut-off luminaire" street lights are recommended; and
  - d. Low pressure sodium lights shall be used.
4. The resort's contribution to life saving on Hapuna Beach: Guests of the resort will frequent this beach and the proposed resort should contribute to lifeguards, etc.

Thank you for consulting us.

Very truly yours,



WILLIAM W. PATY, Chairperson  
Board of Land and Natural Resources

**BELT COLLINS  
& ASSOCIATES**

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July 21, 1987  
87-1506

Mr. William W. Paty, Chairman  
Board of Land and Natural Resources  
P. O. Box 621  
Honolulu, Hawaii 96809

Dear Mr. Paty:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of February 19, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the materials. Your concerns, in their order of appearance in your letter, are addressed as follows.

**Aquatic Resources Concerns** In the Decision and Order of January 16, 1986, several conditions to development were imposed on SMA Use Permit 85-16 by the Hawaii County Planning Commission. Condition 8 states that the applicant is to provide public access to the shoreline and 40 shoreline parking stalls on the South Kohala Resort.

The EIS will address your concerns on possible impacts due to drainage water, wastewater disposal, and nutrient enrichment.

The applicant does not intend to conduct any commercial activities on public beach lands. Further, conditions 11 and 13 of the above permit prohibit both moveable and permanent concession stands to be installed by the applicant within the 40-foot setback area or an additional 20 feet mauka of the public shoreline path, whichever is further mauka. No shoreline improvements are presently planned which would limit the public's current use of State shoreline land for fishing or other recreational use. No significant long-term contamination of coastal waters and resources as a result of resort construction and operations is expected. However, mitigation measures to prevent potential impacts will be described.

**Historic Sites Concerns** Following your recommendation that we submit a copy of the 1985 PHRI report to your office and meet with your Historic Sites Section to answer questions pertaining to historic sites at South Kohala Resort, archaeologist Paul Rosendahl submitted relevant documents to your department and talked with Historic Sites Section staff. We subsequently received a letter dated June 4, 1987 from State Parks Administrator Railston Nagata pertaining to historic preservation review of the proposed South Kohala Resort project, as well as a copy of a letter from Mr. Nagata to Dr. Rosendahl on the same subject. Dr. Rosendahl and I then met with Dr. Ross Cordy of your staff on June 9, 1987. The results of our consultation will be incorporated into the EIS.

Mr. William W. Paty  
July 21, 1987 - page 2

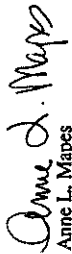
**Recreation Concerns** Your concerns pertaining to resort boundary landscaping, public access, use of beach fronting the proposed development site, water source, and drainage will be addressed in the EIS.

**Water and Land Development Concerns** Without the development of South Kohala Resort, an application for a Shoreline Setback Variance would not be necessary. The EIS will therefore address the impacts of the entire South Kohala Resort project, including improvements proposed for the 40-foot setback area. Mitigation measures to minimize potential detrimental impacts to the shoreline environment resulting from construction activities will be included in the EIS.

**Wildlife Concerns** Your specific concerns 1 through 3 will be addressed in the EIS. Mauna Kea Properties plans to have beach attendants in the area fronting the South Kohala Resort hotel.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, at which time you will have an opportunity to make further comment.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Mr. Wayne J. Yamasaki  
Page two

December 16, 1986  
86-2252

December 16, 1986  
86-2252

Mr. Wayne J. Yamasaki, Director  
Department of Transportation  
State of Hawaii  
869 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Mr. Yamasaki:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-02:12 & 13, 6-6-02:37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

On November 24, 1986, Mauna Kea Properties submitted a Special Management Area Use permit petition and a Shoreline Setback Variance application to the County of Hawaii Planning Department for the proposed project. The Planning Department determined that, due to the Shoreline Setback Variance request, the applicant shall prepare an Environmental Impact Statement (EIS) in accordance with Chapter 343, Hawaii Revised Statutes (HRS). An EIS Preparation Notice announcing this determination was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. A copy of the EISPN and the environmental assessment is enclosed.

We request that you or your organization assist us in preparing the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special knowledge, or interest. You could help us address those issues that are of greatest concern by indicating in writing the specific questions, issues, and topics you believe are important and the reasons why they are.

In addition to identifying any particular concerns you may have regarding the proposed development, we would appreciate answers to the following questions:

1. Are there any plans to improve Queen Kaohumanu Highway in the vicinity of the proposed project?
2. What is the status of improvements for Keahole Airport?

The EIS Regulations stipulate that upon publication of a preparation notice, agencies, groups or individuals have a period of 30 days to make written comments regarding the environmental effects of the proposed project. We hope you will be able to respond within this time period. If all goes as planned, the EIS will be available in April 1987. At that time, the document will be circulated for public review and comment.

Thank you for your cooperation. Should you have any questions, please call me at 521-5361.

Sincerely,

Anne L. Mapes

ALM:lf  
Enclosure



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
140 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

January 23, 1987

Ms. Anne L. Mapes  
Belt Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Ms. Mapes:

EIS Preparation Notice  
Proposed South Kohala Resort  
South Kohala, Hawaii

Currently, we have no plans for improvements to Queen Kaahumanu Highway in the vicinity of the proposed development. However, a fully channelized intersection will be required for the resort's access to the highway. Street lights will also be required and the proposed highway underpass will need to be coordinated with us for access. All plans for improvements within the State highway right-of-way must be submitted to our Highways Division for review and approval. The cost of these intersection improvements will be borne by the developer.

A Traffic Impact Analysis Report will be required which should address, among other things, the effects of the proposed development on Queen Kaahumanu Highway in context with other major developments in the area.

We are presently preparing a master plan and noise compatibility study for Keahole Airport. Scheduled to be completed in late 1987, these studies will provide us with development recommendations for the orderly growth of this airport.

Thank you for this opportunity to provide comments.

Very truly yours,

Edward Y. Hirata  
Director of Transportation

BELT COLLINS  
& ASSOCIATES

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Mr. Edward Y. Hirata, Director  
Department of Transportation  
State of Hawaii  
869 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 23, 1987 regarding the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the materials. The concerns you raised will be addressed in the EIS.

Mauna Kea Properties will provide a channelized intersection at Queen Kaahumanu Highway and the resort entry road. Planning, design and construction of the intersection will be coordinated with the State Department of Transportation. A traffic impact analysis has been prepared for the project which considers the potential impact of the proposed resort as well as regional growth on traffic and the roadway system. Results of the study will be reported in the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,

Anne L. Mapes

AL Mail

cc: Mr. William F. Mielicke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Ms. Patricia Engelhard  
Page two

December 16, 1986  
86-2248

December 16, 1986  
86-2248

Ms. Patricia Engelhard, Director  
Department of Parks and Recreation  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Ms. Engelhard:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-02:12 & 13, 6-6-02:37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

On November 24, 1986, Mauna Kea Properties submitted a Special Management Area Use permit petition and a Shoreline Setback Variance application to the County of Hawaii Planning Department for the proposed project. The Planning Department determined that, due to the Shoreline Setback Variance request, the applicant shall prepare an Environmental Impact Statement (EIS) in accordance with Chapter 343, Hawaii Revised Statutes (HRS). An EIS Preparation Notice announcing this determination was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. A copy of the EISPN and the environmental assessment is enclosed.

We request that you or your organization assist us in preparing the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special knowledge, or interest. You could help us address those issues that are of greatest concern by indicating in writing the specific questions, issues, and topics you believe are important and the reasons why they are.

In addition to identifying any particular concerns you may have regarding the proposed development, we would appreciate answers to the following questions:

1. Please describe County plans for additional recreational facilities and improvements to existing recreational facilities in the West Hawaii region. What is the implementation schedule for the development of these facilities?
2. Do you foresee any potential conflicts between the proposed resort community and the public's use of public recreational facilities in the West Hawaii region? If so, please describe them.

The EIS Regulations stipulate that upon publication of a preparation notice, agencies, groups or individuals have a period of 30 days to make written comments regarding the environmental effects of the proposed project. We hope you will be able to respond within this time period. If all goes as planned, the EIS will be available in April 1987. At that time, the document will be circulated for public review and comment.

Thank you for your cooperation. Should you have any questions, please call me at 521-5361.

Sincerely,

Anne L. Mapes

ALM:lif  
Enclosure



Dana K. Carpenter  
Mayor

Eugene N. Iwawak  
Managing Director



DEPARTMENT OF PARKS & RECREATION

COUNTY OF HAWAII

Patricia G. Engelhard  
Director

Ronald Okamura  
Deputy Director

Ms. Anne L. Mapes  
page 2  
January 2, 1987

January 2, 1987

Ms. Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

Subject: Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Dear Ms. Mapes:

Thank you for the opportunity to review the subject report. Previously requested information regarding potential impacts of the project on the adjoining Hapuna Beach site has been received in your letter to A. Lono Lyman, Planning Director, County of Hawaii, dated August 6, 1985.

With regard to your request for information on proposed County recreational facilities, please be apprised that funds have been secured for planning and design of a gymnasium in Kailua-Kona. The gymnasium will be located adjacent to Kailua Park (old Kona airport site) within a 20+ acre expansion area. Also proposed to be developed within this expansion area is a swimming pool, ballfields, and other support facilities. With regard to the proposed gymnasium, we hope to secure the necessary construction funds within a year.

Another major recreational facility being considered is a public golf course. Its development will depend on the availability of capital improvement or other sources of funds.

In addition to these two projects, our efforts will continue to be concentrated on maintaining and improving, when funds are available, the existing inventory.

In response to your second question, we do not foresee any insurmountable conflicts between the proposed resort community and the use of public recreational facilities in West Hawaii. Major resort developments have, as a general rule, provided their own recreational amenities and have had little, if any, impact on other off-site public facilities.

We hope that the information provided will assist in the preparation of the EIS. If any questions arise or additional information is needed, please do not hesitate to contact this office.

Thank you again for the opportunity to provide input in this phase of the project.

Sincerely,

*Patricia Engelhard*  
Patricia Engelhard  
Director

PE:GH:ai

BELT COLLINS & ASSOCIATES

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Ms. Patricia Engelhard, Director  
Department of Parks and Recreation  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

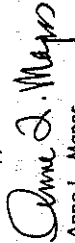
Dear Ms. Engelhard:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of January 2, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. The information you provided in your letter as well as the information provided by your department during past permitting phases will be helpful in preparing the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you wish to make further comment.

Sincerely,



Anne L. Mapes

ALM:lf

cc: Mr. William F. Mielecke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

June 5, 1987  
87-1204

Mr. Guy A. Paul, Chief  
Police Department  
County of Hawaii  
349 Kapiolani Street  
Hilo, Hawaii 96720

Dear Mr. Paul:

Environmental Impact Statement Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

Mauna Kea Properties, Inc. proposes to develop a self-contained resort community on 540 acres of land in South Kohala, identified by Tax Map Keys 6-2-02:12 & 13, 6-6-02:37 & 38. The resort's focus would be a luxury-class hotel and tennis complex, and an 18-hole championship golf course. It would also include residential units, unimproved lots, various recreational facilities, and improvements to the shoreline area.

On November 24, 1986, Mauna Kea Properties submitted a Special Management Area Use permit petition and a Shoreline Setback Variance application to the County of Hawaii Planning Department for the proposed project. The Planning Department determined that, due to the Shoreline Setback Variance request, the applicant shall prepare an Environmental Impact Statement (EIS) in accordance with Chapter 343, Hawaii Revised Statutes (HRS). An EIS Preparation Notice announcing this determination was published in the December 8, 1986 issue of the Office of Environmental Quality Control Bulletin. A copy of the EISP and the environmental assessment is enclosed.

We request that you or your organization assist us in preparing the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special knowledge, or interest. You could help us address those issues that are of greatest concern by indicating in writing the specific questions, issues, and topics you believe are important and the reasons why they are.

In addition to identifying any particular concerns you may have regarding the proposed development, we would appreciate answers to the following questions:

1. Do you foresee the need to add staff or expand operations as a result of the proposed resort development?
2. Do you foresee any special problems serving the proposed resort project? If so, please describe them and indicate mitigation measures to avoid or remedy them.

Mr. Guy A. Paul  
Page two

December 16, 1986  
86-2251

The EIS Regulations stipulate that upon publication of a preparation notice, agencies, groups or individuals have a period of 30 days to make written comments regarding the environmental effects of the proposed project. We hope you will be able to respond within this time period. If all goes as planned, the EIS will be available in April 1987. At that time, the document will be circulated for public review and comment.

Thank you for your cooperation. Should you have any questions, please call me at 521-5361.

Sincerely,

Anne L. Mapes

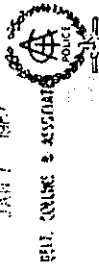
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Enclosure

RECEIVED

JAN 7 1987

POLICE DEPARTMENT

COUNTY OF HAWAII  
349 KAPIOLANI STREET  
HILO, HAWAII 96720



OUR REFERENCE

YOUR REFERENCE

January 5, 1987

Ms Ann L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

RE: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE  
PROPOSED SOUTH KOHALA RESORT, SOUTH KOHALA, HAWAII  
APPLICANT: MAUNA KEA PROPERTIES, INC.

The Environmental Impact Statement Preparation Notice has been reviewed and from the police standpoint, we foresee no adverse effect from the requested land use.

*Guy A. Paul*  
GUY A. PAUL  
CHIEF OF POLICE

LM:gs

cc: Albert Lono Lyman, Planning Director

**BELT COLLINS  
& ASSOCIATES**

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June 5, 1987  
87-1198

Mr. Guy A. Paul, Chief  
Police Department  
County of Hawaii  
349 Kapiolani Street  
Hilo, Hawaii 96720

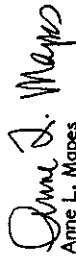
Dear Mr. Paul:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of January 5, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project. We appreciate the time you and your staff spent reviewing the notice and assessment.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, should you want to make further comment.

Sincerely,

  
Anne L. Mapes

AL:msif

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

1/7/87

**BELT COLLINS  
& ASSOCIATES**  
Engineering • Planning  
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Hawaii • Singapore • Australia • Colorado • Hong Kong • S. A.

**RECEIVED**

JAN 8 1987

BELT, COLLINS & ASSOCIATES

Re: EIS, Hapuna Beach

To whom this may concern:

A request to be consulted regarding the above referenced project. Thank you.

yours truly,  
Dave DeCleene

February 2, 1987  
87-228

Mr. Dave DeCleene  
P.O. Box 10962  
Hilo, Hawaii 96721

Dear Mr. DeCleene:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 7, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

Enclosure

Dave DeCleene  
P.O. Box 10962  
Hilo, Hawaii 96721

Belt Collins + Assoc  
606 Bond Street  
Honolulu

Re: EIS - South  
Kohala Resort

Dear Ms. Meyer,

Frequent visits to both Hapuna Beach and the beach fronting the Mauna Kea Beach Hotel will clearly reveal that the former is heavily used and the latter is not. In fact, Mauna Kea guests generally confine themselves to using somewhat less than half of the beach. This beach is in effect private, because only 10 parking stalls are allotted for use by outsiders. Hapuna Beach, by contrast, daily fills its three parking lots.

May I make the following recommendation: Since the beach fronting the Mauna Kea Beach Hotel is in effect private; since it is greatly underused; since Western is the parent company of both the Mauna Kea Beach and South Kohala resort; since Hapuna beach is heavily used every day since Hapuna beach is the only decent beach on the entire Big Island; I believe it to be in the best interest of

Dave DeCleme

P.O. Box 10962  
Hilo, Hawaii 96721

all who live on the Big Island, as well as those who visit here, that the planned hotel be built on the same beach with the Mauna Kea Beach Hotel.

Thanks for listening.

Yours truly,  
Dave DeCleme

BELT COLLINS  
& ASSOCIATES

Engineering - Planning  
Landscape Architecture

805 Canal Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELT H 743474 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Japan

July 20, 1987  
87-1505

Mr. Dave DeCleene  
P.O. Box 10962  
Hilo, Hawaii 96721

Dear Mr. DeCleene:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of March 16, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project, which I sent you on February 2, 1987. We appreciate the time you spent reviewing the materials.

Beach counts have been made at both Hapuna Beach State Park and Kaunaoa Beach during a two-week period of peak use to help assess the impact of development on these recreational resources. The counts and analysis will be included in the EIS.

Alternatives to the current development plan have been considered and a discussion of these alternatives will be the subject of one chapter of the EIS.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

**Glover Orchids, Inc.**

79-4392 Pukiawe St.  
Kailua-Kona, Hawaii 96740

Jan. 5, 1987

RECEIVED

JAN 8 1987  
BELT COLLINS & ASSOCIATES

*Andrew*

*I wish to participate in the South Kohala Resort  
EIS process and request to be consulted.  
Please send the draft EIS document to*

*Miss W. R. Howie, 73-4392 Puhawe St, Kailua - Kona,  
Hawaii 96740.*

*Thank you*

*Sincerely,  
W. R. Howie*

RECEIVED

JAN 16 1987

JOHN COLLINS & ASSOCIATES  
200 BEEK HILLS  
SUNSHINE  
96745

J COLLINS ASSOCIATES  
Planning  
scape/Architecture  
606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELITH 7430474 • Fax (808) 536-7819  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Japan

February 2, 1987  
87-228

Mrs. W. R. Glover  
73-4392 Pukiaue Street  
Kailua-Kona, Hawaii 96740

Dear Mrs. Glover:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 5, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,  
*Anne L. Mapes*  
Anne L. Mapes

ALM:lf  
Enclosure

Ms. Anne L. Mapes  
Beit, Collins and Associates  
606 Coral Road,  
Honolulu, Hawaii,  
56813

Dear Ms. Mapes,

I wish to be considered as a consultant to the Environmental Impact Assessment process for the proposed Hapuna Beach resort. Please send me a copy of the draft document. I will return my comments as soon as I have reviewed it. Thanks.

Yours truly,

*Pat Godfrey*

XTT L Q



February 2, 1987  
87-228

Ms. Pat Godfrey  
P.O. Box 1405  
Kamuela, Hawaii 96743

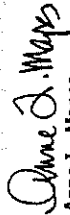
Dear Ms. Godfrey:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

On January 6, 1987, we received your letter requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

  
Anne L. Mapes

A.L.M:lf

Enclosure

RECEIVED

JAN 17 1987

BELT COLLINS & ASSOCIATES

Box 1366  
Kamuela, HI 96743  
December 29, 1986

Ms. Anne L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

I am writing to request to be a consulted party in the preparation of the EIS for the South Kohala Resort.

May I request that the following topics or approaches be included in the draft document:

1. Land-ownership history. Belt Collins did a helpful and careful land-ownership history, presented as an appendix, in the Mahukona Resort EIS. I would like to see something similar done in this EIS, including the land-ownership sequence before and after Parker Ranch's acquisition of the properties about 1905. Can it also be clearly stated that clear title has been obtained for all properties involved in this project. As you may know, Parker Ranch titles have met with some difficulties in other locations, hence my request.

2. The County Department of Water Supply, in a letter to the Planning Department dated 11/2/84, expressed the view that the full resort might need 3.5863 million gallons of water per day and that only 0.5341 mgd was still available as MKP's allotment from the Lalamilo water system. Would you please include the Water Department's view, which differs from MKP's appraisal, in the text of the EIS, and discuss the discrepancy along the following lines: If the Water Department's view should prove correct, as may be possible, who will fund the development and distribution of the 3.0522 additional mgd required for the resort? Is MKP willing to fund all or a specific percentage of the expenses? I found MKP's previous assertion, that "it would work with government" to provide additional water as necessary unacceptably vague both with a view to future fiscal planning by government and to the taxpayers' right to know what burden he might bear in meeting the resort's possible water needs.

3. Since one of the prime public concerns has been the visual impact of the project hotel on the public beach area, would you include in the EIS a vertically-oriented sketch of the hotel as it relates to the beach. I have seen such an architect's rendering as part of the PUD application for this project. I am requesting a front-view portrayal from the shoreline, rather than side-view elevations shown in the shoreline setback variance assessment previously submitted, which do not represent anyone's actual line of vision.

4. Will the EIS please discuss, in terms of actual practical likelihood, how sewage will be handled. For example, the original Assessment prepared by Belt, Collins inferred that treated effluent would be used to irrigate the golfcourse. However, at present treated effluent is, I believe, not so used either at the Mauna Kea Beach Hotel or Mauna Lani Bay Hotel, which latter has a somewhat different system. I am concerned about a potential heavy reliance on injection wells in conditions of a high water table and many springs which characterize this area. Would the EIS please have brief recourse to discussing injection well concerns as expressed in the scholarly Hawaiian Waste Injection Practices and Problems (Water Resources Research Center, Technical Report No. 123, January 1979, University of Hawaii). Since the Mauna Kea Beach Hotel treatment plant is, I believe, similar to what is envisioned for the SKR, I have difficulty understanding why treated effluent does not go to the golfcourse at MKBH, while it will presumably do so at the SKR. Thank you for clarifying this matter in the EIS.

5. I assume the EIS will discuss lateral shoreline public access requirements and conditions, in part as required by the Settlement Agreement of 1981 by which legal case lateral access was provided along the shore from Spencer Park to MKBH and from Hapuna Beach to Kaunaoa Bay.

Before asserting that this trail is in place, I encourage those preparing the EIS to attempt to walk the trail from Spencer to Kaunaoa. In doing so in good faith and with favorable expectations myself about a year ago, I found

3

the shoreline foottrail banked with great piles of burnt and sawn kiawe, giving what I felt was a deliberately ugly or off-putting impression. In other places the trail was blocked by piles of kiawe or disappeared. With regard to an inland road, which I understand also to be part of the Settlement Agreement and which led to a small parking lot with signage near a small beach, the road itself was barred so that the parking lot was of course unused. In this description I am not including the small private parcels which I understand do intervene in this trail and which are not under the control of MKP.

I am hopeful that, in order to validate any statements on this public access which might be made in the EIS, Mauna Kea Properties will look to the proper maintenance of that portion of the trail and roadway between Spencer and Kaunaoa. Perhaps resort officials, who have spoken quite warmly of this "nature trail" in the press, are out of touch with the conditions that actually prevail there.

Sincerely,  
*Judy Graham*  
 Judy Graham

February 3, 1987  
87-235

Ms. Judy Graham  
P.O. Box 1366  
Kamuela, Hawaii 96743

Dear Ms. Graham:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of December 29, 1986 requesting to be a consulted party in the EIS process. Thank you for your comments to which I respond below in the order of their appearance in your letter.

Land Ownership History. I consulted with one of Mauna Kea Properties' attorneys, Tony Chan, to help me address your concerns on land ownership from a legal perspective. It is true, as you have stated, that some Parker Ranch titles have met with some difficulties. The disputed lands in question, however, are geographically removed from the parcels of the proposed South Kohala Resort. None of the property of the proposed South Kohala Resort have ever been challenged as to ownership. These include both land previously owned in fee by Mauna Kea Properties or its predecessors and land leased from Parker Ranch that has recently been purchased in fee (vested in Mauna Kea Properties, Inc. by limited warranty deed from the Richard Smart Revocable Personal Trust, dated November 26, 1986, recorded in liber 20084 at page 424). It follows, then, that clear title has been obtained for all properties involved in the South Kohala Resort project and there is no need to include a land ownership history in the EIS.

Water Supply. The subject of potable water supply for the proposed resort will be explored more fully in the EIS following consultation with the County Department of Water Supply.

Visual Impact of Proposed Hotel on Public Beach Area. We will work with Mauna Kea Properties' architectural consultant to analyze the hotel's potential visual impact on persons viewing the hotel and grounds from the beach. We will ask for a front-view portrayal from the shoreline.

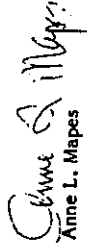
Sewage Treatment and Disposal. The developer plans to use treated effluent from the sewage treatment plant for golf course irrigation. When development first began at Mauna Kea Beach Resort and Mauna Lani Resort, there was not enough treated effluent to irrigate the resorts' golf courses. Eventually, as more units were built and more wastewater generated, effluent was mixed with brackish water for golf course irrigation. As future development occurs, the percentage of treated effluent compared to the percentage of brackish water will increase so that all available effluent will be used for irrigation.

Lateral Shoreline Public Access. Shoreline public access will be addressed in the EIS. In compliance with Special Management Area Use Permits Nos. 133 and 142 of the County of Hawaii, Mauna Kea Properties maintains the public nature trail from Hapuna Bay to Kaunaoa Bay and from Spencer Park to the Westin Mauna Kea Beach Hotel. As you point out, two private parcels interrupt the trail so that it is not continuous. I walked the portion of the trail that goes through the proposed South Kohala Resort project site in early January and found it generally well maintained. One sign at the beginning of the trail had fallen off the post, but the trail was clear all along its length, with vegetation cut back. Although I did not walk the segment of the nature trail that goes from the Westin Mauna Kea to Spencer Park, I drove on the inland road past the parking lot you describe, all the way to Spencer Park; at no point was the road barred. Although there was free access that day, there were no cars at the parking lot.

I presume that your comments are based on a review of the EIS preparation notice and environmental assessment (EISPN). In case they are not, I am enclosing a copy of the EISPN. If you have any additional comments based on this information, we would appreciate having them. We would like to receive any other comments you may have within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

  
Anne L. Mapes

ALM:ll  
Enclosure

RECEIVED

JAN 8 1987

BELT COLLINS & ASSOCIATES

285 WHITMORE ST. #104  
OAKLAND, CA 94611  
6 JANUARY 1987

BELT COLLINS  
& ASSOCIATES

Engineering • Planning  
Landscape Architecture

606 Conaf Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 743074 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Japan

February 2, 1987  
87-228

Ms. Marian Gushiken  
288 Whitmore Street, #104  
Oakland, California 94611

Dear Ms. Gushiken:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 6, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:mf

Enclosure

DEAR MS. MAPES:

I AM A BIG ISLANDER CONCERNED WITH THE SOUTH KOHALA RESORT DEVELOPMENT. I UNDERSTAND THAT A REQUEST TO BE CONSULTED WILL ALLOW ME TO RECEIVE A DRAFT OF THE EIS DOCUMENT, AND WOULD APPRECIATE A COPY BEING SENT TO THE ABOVE ADDRESS WHEN COPIES BECOME AVAILABLE.

THANK YOU VERY MUCH.

SINCERELY YOURS,  
*Marian Gushiken*  
MARIAN GUSHIKEN



RECEIVED

JAN 7 1987

BELT, COLLINS & ASSOCIATES

BELT COLLINS & ASSOCIATES

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1/4/86

February 2, 1987  
87-228

Dear Ms. Mapes:

*Please acknowledge this as my "request to be consulted" regarding the EIS your firm is preparing for Mauna Kea Properties' Papaya Peak Hotel. I would appreciate a copy of the draft when ready. Mahalo!*

*Thomas Hagen*

PS: Please use this address ↓

Mr. Thomas Hagen, President  
South Kohala Management  
P.O. Box 3301  
Waikoloa, Hawaii 96743

Dear Mr. Hagen:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 4, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

Enclosure

RECEIVED

JAN 9 1987

BELT, COLLINS & ASSOCIATES

Anne M. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes;

This is a request to be consulted in the EIS process for the South Kohala Resort. I would appreciate your sending a copy of the document's draft to me at the above address.

Sincerely,

*William D. Heacox*

William D. Heacox

P.O. Box 337  
Paauilo, HI 96776  
Jan 6, 1986

BELT COLLINS  
& ASSOCIATES

Engineering • Planning  
Landscape Architecture

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February 2, 1987  
87-228

Mr. William D. Heacox  
P.O. Box 337  
Paauilo, Hawaii 96776

Dear Mr. Heacox:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 6, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessments describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*

Anne L. Mapes

ALM:lf  
Enclosure



**Ka Ohana O Kalae**  
Concern Hawaiians & Friends

**RECEIVED**

JAN 8 1987

BELT, COLLINS & ASSOCIATES

**BELT COLLINS  
& ASSOCIATES**

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Landscape Architecture

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Hawaii • Singapore • Australia • Colorado • Hong Kong • Szechwan

February 2, 1987  
87-228

January 6, 1987

Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Attn: Anne L. Mapes

Dear Ms. Mapes:

Our Ohana would like to request consulted party status and comment on the draft Environmental Impact Statement for the planned South Kohala Resort near Hapuna Beach. If copies of the draft will be available, we would greatly appreciate receiving one.

Mahalo,

KA OHANA O KALAE

Ka Ohana O Kalae  
P.O. Box 673  
Naalehu, Hawaii 96772

Gentlemen:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 6, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

Enclosure

**BELT COLLINS  
& ASSOCIATES**  
Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7430474 • Fax (808) 536-7879  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Susan

February 2, 1987  
87-228

Mr. I. Michael Kassel  
78-6417 Mamalaha Highway  
Hohala, Hawaii 96725

Dear Mr. Kassel:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

On January 20, 1987, we received your letter requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lif

Enclosure

*I. MICHAEL KASSEL  
Box 323*

*HOLAHA, HAWAII 96725  
address: 78-6417 Mamalaha Highway  
Hohala, 96725*

*Ms. Anne L. Mapes  
Belt, Collins & Assoc.  
606 CORAL ST.  
HONOLULU, HI 96813*

*Dear Ms. Mapes,*

*Could you please send me a draft  
South Kohala Resort E.I.S.?*

*Thank you,*

*AMK*

**RECEIVED**

JAN 20 1987

BELT COLLINS & ASSOCIATES

*Hawaii*



RECEIVED

JAN 8 1987

BELT COLLINS & ASSOCIATES

HUGH R. MONTGOMERY, PhD  
P.O. BOX 2193  
KAMUELA, HAWAII 96743

January 7, 1987

M.L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Dear Mr. or Ms. Mapes:

This is to inform you of my interest in the Environmental Impact Statement being prepared for the proposed development by Westin Corporation adjacent to Hapuna Beach on Hawaii. I hereby request to be consulted in the EIS process and to be provided with relevant materials.

Thank you for your attention.

Sincerely,

*Hugh R. Montgomery*

Hugh R. Montgomery, PhD

BELT COLLINS  
& ASSOCIATES

Engineering • Planning  
Landscape/Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELT-H • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Saigon

February 2, 1987  
87-228

Dr. Hugh R. Montgomery, PhD  
P.O. Box 2193  
Kamuela, Hawaii 96743

Dear Dr. Montgomery:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 7, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

Enclosure

**BELT COLLINS  
& ASSOCIATES**

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTTH 7430474 • Fax (808) 538-7819  
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February 2, 1987  
87-228

Mr. William T. Slattery  
447 W. Kawaiiani Street  
Hilo, Hawaii 96720

Dear Mr. Slattery:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your postcard of January 6, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:mlf

Enclosure

Request to Be Consulted

William T. Slattery  
447 W. Kawaiiani St.  
Hilo, Hawaii 96720

**RECEIVED**

JAN 19 1987

BELT COLLINS & ASSOCIATES

**RECEIVED**

JAN 8 1987  
Laura Libofski - Spiegel  
Box 36  
Kula, Hawaii 96727

To whom it may concern:  
As a resident of the county of Hawaii, I would like to voice my concern as to the impact of the proposed South Kohala resort (a line now at Hapuna Beach State Park, the parking lot is full + overflowing, the toilets, mostly, are clogged and the beach is quite full and dog excrement compared to five or ten years ago. Of the motel part the jobs provided by this development will be filled by local residents in service positions, and with pay nowhere near comparable to visiting hotel prices and cost of living.

Finally after all this development, the only remaining touch on the

**BELT COLLINS  
& ASSOCIATES**

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7430474 • Fax (808) 538-7819  
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Engineering • Planning  
Landscape Architecture

February 2, 1987  
87-230

Ms. Laura Libsohn-Spiegel  
Box 36  
Kukuihaele, Hawaii 96727

Dear Ms. Spiegel:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 6, 1987 with comments on the above project and a request to be a consulted party in the EIS process. Your concerns will be taken into consideration in the preparation of the EIS. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. If you have any additional comments based on this information, we would appreciate having them. We would like to receive any other comments you may have within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:mlf

Enclosure

with island will be like (my island) with just that and a lot of buildings on the horizon.

I feel very strongly in this day, age of uncontrolled development and destruction of natural beauty in the world, that we must start looking beyond capital gains for a smaller municipality at the expense of the majority at a request to be consulted.

I would like to hear from you.

The comments I hear from folks about Maui, and what progress has done there, should be a fair warning to this island.

Mohalo

Laura Spiegel

**BELT COLLINS  
& ASSOCIATES**  
Engineering • Planning  
Landscape Architecture

666 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 527-5361 • Telex BELTH 7430474 • Fax (808) 528-7819  
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Jan Walker  
P.O. Box 1424  
Kamuela, Hawaii 96743

RECEIVED

JAN 9 1987

BELT COLLINS & ASSOCIATES

January 7, 1986

Ms. Anne L. Mapes  
Belt, Collins and Associates  
606 Coral St.  
Honolulu, Hawaii 96813

re: EIS for Mauna Kea Properties

Dear Ms. Mapes,

I am quite concerned as to specific problems posed by the development of Hapuna Beach by Mauna Kea Properties for resort usage. I have questions which I assume will be addressed by the Environmental Impact Statement, to which I submit the following:

1. What type of herbicides and/or pesticides of toxic content are to be used by the resort for landscape maintenance, and specifically, how will seepage into Hapuna Bay after prolonged usage be controlled? Is the resort willing to institute hand-weeding and cutting rather than sprays?
2. How will the fresh water drainage into the north end of Hapuna Bay be affected by the building and landscaping, and what measures are being taken to assure the water will remain non-polluted?
3. Will there be an adequate back-up power system for pumping of sewage when the regular electrical system is down? Or will there be some other type of sewage system that will allow for no seepage into Hapuna Bay?

I welcome the opportunity to participate in the input of how my community will develop in a responsible manner in order to protect the beauty and purity which is the most valuable asset of our area. Please send the EIS comments to me at the above address.

Sincerely yours,

*Jan Walker*  
Jan Walker

February 2, 1987  
87-229

Ms. Jan Walker  
P.O. Box 1424  
Kamuela, Hawaii 96743

Dear Ms. Walker:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 7, 1987 with questions on the above project. Your concerns will be taken into consideration in the preparation of the EIS. I presume that your comments are based on a review of the EIS preparation notice (EISPN) and environmental assessment. In case you have not seen a copy of the EISPN, I am enclosing a copy for your review. If you have any additional comments based on this information, we would appreciate having them. We would like to receive any other comments you may have within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

Enclosure

RECEIVED

MAR 4 - 1987

Jan Walker  
P.O. Box 1424  
Kamuela, Hawaii 96743

BELT COLLINS  
& ASSOCIATES  
ENGINEERING - PLANNING  
LANDSCAPE ARCHITECTURE

1466 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELT H 7444 F1 • Fax (808) 536-7819  
Hawaii • Singapore • Australia • Canada • Hong Kong • New York

February 28, 1987

Ms. Ann L. Mapes  
Belt, Collins and Associates  
606 Coral St.  
Honolulu, Hawaii 96813

July 20, 1987  
87-1503

Ms. Jan Walker  
P. O. Box 1424  
Kamuela, Hawaii 96743

Dear Ms. Walker:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

I have carefully read the EIS Preparation Notice for the Mauna Kea Beach Hotel's proposed development. I still feel that my original concerns regarding the impact of the proposed development have not been properly addressed by the EISPN. There was mention of protecting the water quality, but not in specific terms. I should like to know the specific means by which Mauna Kea Properties proposes to accomplish this. There was no mention whatsoever of an alternate energy system to provide a means for sewage pumping during power failures.

Thank you for your letter of February 28, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project, which I sent you on February 2, 1987. We appreciate the time you spent reviewing the materials.

The concerns expressed in your February 28 letter and in your January 7, 1987 letter will be addressed in the EIS. For your information, a fertilizer and herbicide use impact analysis has been prepared and the results will be reported in the EIS.

The EIS will contain a socioeconomic impact analysis which will include the projected demand for new housing as a result of resort development. It is expected that the timing of housing assistance will be the subject of discussions between the County of Hawaii and the developer.

A section of the EIS will be devoted to current and projected use of Hapuna Beach State Park as well as other recreation resources.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,

Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

re: EIS Preparation Notice, Mauna Kea Beach Hotel

Ms. Mapes,

The EISPN has raised further questions. In recognition of the increased demand for additional housing, MKP intends to work with the county on the problem. I would like to know if this is to happen prior to, or after the fact of beginning construction. The hotel acknowledged additional population impact on the beach. To control this, the absurd notion of restricting guests to the bar on long holiday weekends comes to mind, but I assume this is not the case, and would like to be informed on this topic also.

You may respond to me directly at the above address. I also wish to go on record as supporting the resort development without shoreline improvements, providing they meet the above considerations in a reasonable manner.

Sincerely,

Jan Walker

cc: Albert Lono Lyman, Director

P.O. Box 1802  
Kamuela, Hi. 96743  
808-775-0810

**MAR 9 1987**

February 2, 1987  
87-228

March 6, 1987

Mrs. Pamela S. Washburn  
P.O. Box 1802  
Kamuela, Hawaii 96743

Ann L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hi. 96813

Dear Mrs. Washburn:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your postcard of January 7, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,  
*Anne L. Mapes*  
Anne L. Mapes

ALM:HH  
Enclosure

1/7/87  
TO WHOM IT MAY CONCERN:  
THIS IS A REQUEST TO BE CONSULTED  
ON ALL MATTERS PERTAINING TO THE  
EIS PROCESS FOR THE SOUTH KOHALA  
RESORT. PLEASE SEND INFORMATION  
TO:  
PAMELA S. WASHBURN  
P.O. BOX 1802  
KAMUELA, HI. 96743  
BELT COLLINS & ASSOCIATES  
808-775-0810 MAHALO

Aloha Ms. Mapes:

This letter is in response to your letter postmarked February 3, 1987 and received by me on February 7, 1987. It contains my response to the EIS process for the scheduled Soyh Kohala Resort, formerly known as the Hapuna Resort.

I request to be informed of any and all public hearings forthcoming in this matter that will be held on the Big Island. Please give me advance notice so I might rearrange my schedule as necessary in order to be present to give testimony.

As a frequent user of Hapuna Beach over the past fourteen and one-half years of my residency on the Big Island, I object to the building of this resort complex on the only large, easily accessible white sand beach here, which is frequented by residents from the entire area and by visitors from out of state and country.

I offer the following comments on specifics:

GRADING:

Prior to the current "improvements" at Hapuna Beach State Park, there existed no wind problems on windy days. After the grading of the hills to build pavillions and restroom facilities, the wind, on windy days plays havoc with the sand, often creating whirlwinds of sand making it uncomfortable to be on the sand unless sheltered by the one existing rock formation on the beach. I believe that further grading of the lands on the northern end of the beach will add to this problem even more so, making the beach unprotected on such windy days.

LANDSCAPING:

Though so-called uncontrolled vegetative growth may be unbecoming to the eyes of developers, as a naturalist I enjoy the way God and nature work together to provide a display of beauty all their own. I find it deplorable that developers find the need to destroy this natural beauty in order to please their own eyes.

NATURE TRAIL:

The public beach access nature trail (as referred to on page 4 of

your document) is actually the old Hawaiian trail and to see it cemented, with walls and steps in some areas is a degradation of the 'aina and a ravage of nature which would negate the pleasure of having outdoor terrain to hike upon. Paving this area for the convenience of the upper class residents who will inhabit the proposed complex is indicative of the desire to "make things easy" for a particular class of people. Such plans are disgusting.

As the trail currently passes through the area it gives one a respect for nature which would be entirely missing in the presence of cemented, staired and walled walkways. The proposed walls will hinder access to the rocks below in which can be found wonderful tide pools and simple access to the rocks on which one can sit simply to enjoy the view. Fishermen and visitors to the area would be discouraged from partaking of nature's beauty except as defined by man in his own limited terms.

CONSTRUCTION:

Runoff water during the more than one year construction will affect the quality of the ocean and swimming waters adversely. These waters are used daily for swimming, fishing and other recreation. With increased usage of the land the native flora, fauna and bird species will be adversely affected, for as it is now, the limited traffic provides little disturbance. With increased traffic the entire area will suffer and it's current peaceful will be destroyed.

MARINE ENVIRONMENT:

Quite the contrary to what is stated here, the waters from Mauna Kea Beach to Hapuna Beach are often used for fishing, snorkeling, and scuba diving. In fact, scuba diving classes are often held at the cove where the proposed beach club is scheduled.

The only way to maintain the Class AA pristine waters is to not construct anything in the area, but to allow it to remain as is. Construction run-off, even if supposedly controlled will adversely affect the entire shoreline.

ARCAEOLOGICAL RESOURCES:

The structures as noted here would be definitely affected by construction and landscaping, even if they are located some 400 feet inland. To surround them with man's idea of beauty is to detract from the historical value they represent.

VIEWPLANE:

There is no possible way to maintain an "open" viewplane of the coastline with the presence of 150-200 condo units and a 350 room hotel along with beach club, etc. The only openness one could experience would be from viewing the area aboard aircraft or sea-craft, which the majority of the public using this beach does not have access.

Shoreline views would be heavily affected by the existence of this resort with it's man made attitudes toward nature. Those who use this area are not concerned with seaward views, but rather with the destruction of the existing shoreline and the impact this would have on the persons who use this recreational area.

SOCIOECONOMIC CONSIDERATIONS:

As usual, employment provided for this project would benefit construction companies the most. The local residents would be handed the lower service positions, thereby maintaining the plantation mentality toward local residents. It is quite doubtful that any positions of import (ie management and executive) would be offered current residents, even on an on-the-job-training basis. Thus the local residents would be merely given the lower escheion employment maintaining the "new plantation economy", better known as the tourist industry.

ALTERNATIVES:

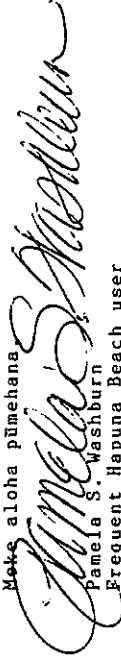
I fully support the alternative of "NO ACTION".

RECREATION:

I have much to offer on this subject, but find that I must leave in order to certify this mail before our rural post office closes for the day. I will therefore give my comments on this matter at the public hearings.

Mahalo nui loa for your letter and document and I do pray that the hotel will either be built and marketed as a mauka resort or not built at all.

Meke aloha pūmehana



Pamela S. Washburn

Frequent Hapuna Beach user

Ms. Pamela S. Washburn  
July 22, 1987 - page 2

July 22, 1987  
87-1502

Ms. Pamela S. Washburn  
P. O. Box 1802  
Kamuela, Hawaii 96743

Dear Ms. Washburn:

**Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii**

Thank you for your letter of March 6, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project, which I sent you on February 2, 1987. We appreciate the time you spent reviewing the materials.

**Information on public hearings** to be held in conjunction with review of the South Kohala Resort project is provided in accordance with Hawaii County regulations. As a point of clarification, the resort will not be built on the public beach at Hapuna, but rather on privately-owned land adjacent to and inland of the beach. Specific concerns expressed in your letter are addressed as follows in their order of appearance.

**Grading and Landscaping** There will be some grading at South Kohala Resort adjacent to the northern end of Hapuna beach. It is expected that some of the existing vegetation will be retained, but trimmed. Other vegetation will be replaced with different species.

**Nature Trail** In 1981, a six-foot wide perpetual easement was established for pedestrian access along the shoreline and a nature trail currently exists from Hapuna Bay to Kaunaoa Bay and beyond. The old Hawaiian trail, as shown on old tax maps, does not coincide with the shoreline nature trail at the South Kohala Resort project site. Access to tide pools will not be hindered as a result of development.

**Construction** Precautions will be taken during construction to minimize potential temporary adverse impacts associated with construction activities.

**Marine Environment** Given concerns such as yours about water quality and potential impacts on the marine environment, a new marine baseline study and a fertilizer and herbicide use study have been prepared and the results will be reported in the EIS.

**Archaeological Resources** The results of archaeological survey and testing will be summarized in the EIS. Historic and archaeological sites identified by the consulting archaeologist are deemed to have varying degrees of research, interpretive, and cultural value.

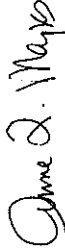
**Viewplane** Inland views from the public beach will be changed by development of the adjacent resort parcels. The impact of development will be assessed in the EIS.

**Socioeconomic Considerations** A socioeconomic impact analysis has been prepared for the EIS and will address temporary construction period and long-term operational period employment.

**Alternatives** A chapter of the EIS will discuss the various alternatives considered.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,



Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



RECEIVED

JAN 8 1987

BELT, COLLINS & ASSOCIATES

F. REEVE WILLIAMS  
BOX 3185 - WVS  
KAMUELA - HAWAII 96743  
(808) 883-2228

Jan 6, 1987

Ann Mapes  
Belt, Collins & Assoc.  
606 Coral St.,  
Honolulu, Hi. 96813

Aloha,

Would you please send me  
at the above address - A Draft  
Copy of the E.I.S. Document for  
the South Kohala Resort on behalf  
of myself and other Property  
Owners of our Waikohala Village  
Association membership who have  
expressed interest.

Thank you

*Ann Mapes*

BELT COLLINS  
& ASSOCIATES

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7430474 • Fax (808) 538-2819  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Japan

February 2, 1987  
87-228

Mr. F. Reeve Williams  
Box 3185 - WVS  
Kamuela, Hawaii 96743

Dear Mr. Williams:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 6, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

AL:MHJ

Enclosure

P O Box 3185, Waikoloa Village  
Kamuela, Hawaii 96743  
February 22, 1987

Ms. Anne L. Mapes  
Belt Collins and Associates  
606 Coral Street  
Honolulu, HI 96813

RECEIVED

FEB 24 1987

U.S. DEPARTMENT OF THE INTERIOR

Dear Ms. Mapes:

Thank you for providing a copy of the EIS statement for the South Kohala Resort and affording us the opportunity to comment.

At the outset I would like to request that our Waikoloa Community Association be included as one of the agencies to be formally consulted throughout the EIS process. Together with the Puako and Kawaihae Communities, we are the nearest established population center to the proposed resort and will likely be unavoidably impacted by it.

I think I am correct in saying that our major concerns at this stage center primarily upon the infrastructural impact the resort will have; and we all have a major concern about increased overflights of our community as a direct result of the resort. Regards the latter, we have been experiencing bothersome and noisy overflights from tour helicopters servicing the existing resorts on the South Kohala Coast for some time now, and these have increased geometrically over the years proportionate to the increase in hotel and condominium activity on the coast. What do you consider the impact to be as a result of the development of this resort? Will you establish procedures or guidelines to control them?

Regards the subject of infrastructure in lower South Kohala, suffice to say that we have virtually none apart from what the major developers (ie, Rockefeller, Mauna Lani, and Boise Cascade) established. This includes the main highway running Mauka-Makai through Waikoloa, which connects the Queen's highway along the coast to the Belt Highway that traverses the highlands between Puu Waa Waa and Kamuela. The highway connecting Kamuela to Kawaihae (which many of us - as well as fire and police - use) is already congested to the point of absurdity, while traffic on the Queen's highway has tripled in the past two years (although that road can absorb much more than what exists at present). Our nearest rubbish receptable (which our county administration is now considering charging us to use because of overuse), is 24 miles distant and this also applies to schools, medical facilities, and fire and police. Moreover we are now down to only two access-

Ms. Anne L. Mapes  
February 22, 1987  
Page 2

ible public beaches. To many of us who have long since made our commitments and investments here, and are now witnessing the steady erosion of the quality of life that brought us here in the first place, we can't help but worry about what the impact of a project of this size will have on these scarce or non-existing facilities. We look at the Kaaupali area on Maui and wonder whether we are next in line for that kind of "development" which results historically in a corresponding paralysis of the limited infrastructure and an inevitable raise in taxes.

In light of the above, will you please include some specific estimates (by year) for the number of transients the resort will bring and do likewise for the number of residents? Also would you please be quite specific as to the infrastructural impact the resort will have (beyond in-house requirements) and discuss the developer's plan (if any) for participating in this development? It should be noted that the one thing we do have already is adequate land and housing in the area, and regular market mechanisms will quickly result in the establishment of low price housing when and where needed. Therefore if the thrust of the developer's contribution to the public sector was aimed at infrastructural development per se, then the burden would be lifted from us taxpayers and we might likewise experience some reasonable gain in property value and have some vested interest in the project's completion (unlike at present).

I ask that you communicate these views to the developers and explain that from the residents' viewpoint (as distinct from that of local politicians), the establishment of "affordable housing" (for hotel servants and workers) and the promise of "windfall revenues" (which we likely will never benefit from) as the quid pro quo for "official blessing to proceed" is actually contrary to our interests and is an enticement which has little if any popular support. Agreed-upon infrastructural development, however, would find a wide range of support from residents, business groups, politicians, realtors, and contractors alike.

The final input I would like to make is to stress that Hapuna Beach is truly regarded as "The Crown Jewel" of this island and apart from a few small, thoroughly congested beaches in and around Kailua-Kona and a tiny sandy cove at Kawaihae - is the only white sand beach on this island accessible to the public. This is a situation unlike anywhere else in Hawaii. There is no denying that Hapuna will become heavily impacted as a direct result of

Ms. Anne L. Mapes  
February 22, 1987  
page 3

604 Canal Street, Honolulu, Hawaii 96813 • Phone (808) 521-5161 • Telex BILIH 749073 • Fax (808) 521-5162  
Hawaii • Singapore • Manila • Colorado • Hong Kong

July 20, 1987  
87-1504

this project (in-house facilities notwithstanding) but many of us are willing to make that trade off for environmentally-sensitive, quality development (such as this purports to be). Should the developer attempt to alter or deny any portion of the existing beach at Hapuna to the general public (thru "landscaping", etc.), however, they will meet with a groundswell of popular opposition. The problem at Hapuna is exacerbated by the developer's access/restrictive parking policy at Kaunoa Bay and by their double standard of setting up cabanas and beach chairs nearly to the water's edge well within the public domain, thereby effectively shutting off "the hotel's beach" to the public, while rigidly enforcing any transgressions across the "high wash of the waves" demarkation line at the opposite or "public" end of Kaunoa Bay beach. Local folks really resent that and are determined not to let that happen at Hapuna.

Thank you for taking the time to read this. Hopefully it will be of assistance to you in preparing your EIS. There is a good deal more that could be said obviously, particularly concerning water run-off and sedimentation, provisions for sewage system failure, etc; but I will leave that to others and hope that your developer has the foresight to take no risks whatsoever with our environment (since we would all lose in that situation). Again thank you for the opportunity to contribute and please keep us informed on a timely basis.

Sincerely,



F. Reeve Williams

Mr. F. Reeve Williams  
P. O. Box 3185  
Waikoloa Village  
Kamuela, Hawaii 96743

Dear Mr. Williams:

Environmental Impact Statement (EIS) for  
Proposed South Kohala Resort Development  
South Kohala, Hawaii

Thank you for your letter of February 24, 1987 commenting on the EIS Preparation Notice and Environmental Assessment for the above project, which I sent you on February 2, 1987. We appreciate the time you spent reviewing the materials.

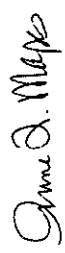
Overflights of your community will not increase directly as a result of proposed development; no heliport is planned for South Kohala Resort.

A socioeconomic impact analysis and a regional traffic impact analysis are being prepared for the EIS. The number of visitors and residents as a result of South Kohala Resort development will be projected, as will be the increase in traffic. We note your concern for adequate infrastructure in West Hawaii and understand that infrastructure development is the subject of ongoing negotiations between governmental agencies and private developers.

We recognize the role of Hapuna Beach State Park as a major public shoreline recreation area for not only West Hawaii but also the island as a whole. A section of the EIS will be devoted to a discussion of the existing use of the beach park as well as the potential impacts due to South Kohala Resort development and other resort and residential development on the island.

We expect to file the Draft EIS with the State Office of Environmental Quality Control (OEQC) within the next two months. The OEQC Bulletin will announce the availability of the Draft EIS for review, and you will have an opportunity to make further comment at that time.

Sincerely,



Anne L. Mapes

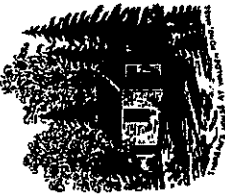
cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

OFFICE OF

**OFFICE OF GLEN M. WINTERBOTTOM**

**Ka'u Homesteader,**

Following in the  
Footsteps of  
Henry David Thoreau,  
(1817-1862).



No. 27 Poha Street.  
Mailing Address:  
Post Office Box W.



*Maalehu, Kau, H. I. January 6, 1987*  
[96772] U. S. America

**RECEIVED**

JAN 8 1987  
BELT, COLLINS & ASSOCIATES

Ms. Anne L. Mapes  
Belt, Collins and Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Reference: South Kohala Resort EIS.

Dear Anne:-

I would like to request that I be made a consulted party in the Environmental Impact Statement process for the proposed South Kohala Resort, adjacent to Hapuna Beach. If permissible, could I also request a copy of the developer's draft Impact Statement for said project?

Thanking you for your kind attention to my above requests, I remain

Yours Respectfully,

*Glen M. Winterbottom*  
GLEN M. WINTERBOTTOM  
Ka'u Homesteader

**BELT COLLINS & ASSOCIATES**

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Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7430474 • Fax (808) 536-7019  
Hawaii • Singapore • Australia • Colorado • Hong Kong • Sudan

February 2, 1987  
87-228

Mr. Glen M. Winterbottom  
Ka'u Homesteader  
P.O. Box W  
Maalehu, Hawaii 96772

Dear Mr. Winterbottom:

Environmental Impact Statement (EIS) Preparation Notice  
Proposed South Kohala Resort, South Kohala, Hawaii

We have received your letter of January 6, 1987 requesting to be a consulted party in the EIS process for the above project. Enclosed is a copy of the EIS preparation notice and environmental assessment describing the project. You can help us in preparing the EIS by providing comments on the proposed South Kohala Resort development. We would appreciate receiving your comments within 30 days of receiving this letter.

Thank you for your cooperation. If you have any questions, please call me at 521-5361.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

ALM:lf

Enclosure

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## **CHAPTER XIII**

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## CHAPTER XIII

### CONSULTED PARTIES AND THOSE WHO PARTICIPATED IN THE PREPARATION OF THE FINAL EIS

An announcement of the availability of the Draft Environmental Impact Statement (DEIS) for the proposed South Kohala Resort was published in the OEQC Bulletin by the Office of Environmental Quality Control on September 23, 1987. The agencies, organizations, and individuals listed below were sent copies of the DEIS with a request for their comments on the project. Those believed to have an interest in the project or who requested consulted party status were mailed a copy of the report. Parties that replied with comments are marked with an asterisk, and copies of these letters are reproduced herein. If the comments were substantive and required a response, copies of the response letters are also presented on the following pages. Parties that replied with "no comment" statements are marked with two asterisks. Those who submitted substantive comments after the November 9, 1987 deadline are indicated with a dashed line; copies of these letters and the responses are included in this chapter.

#### Federal Agencies

- \*\* U.S. Department of Agriculture, Soil Conservation Service
- \* Department of the Army, U.S. Army Engineer District, Honolulu  
Army-DAFE (Facilities Eng. - USASCH)  
U.S. Coast Guard
- \* U.S. Department of Commerce, National Marine Fisheries Service
- \* U.S. Department of the Interior, Fish and Wildlife Service  
U.S. Department of the Interior, Soil Conservation Service
- \*\* Department of the Navy, Commander, Naval Base Pearl Harbor

#### State Agencies

- \*\* Department of Accounting and General Services, State Public Works  
Engineer
- \* Department of Agriculture
- Department of Business and Economic Development
- \*\* Department of Business and Economic Development, Energy Division
- \*\* Department of Business and Economic Development, Housing Finance and  
Development Corporation
- \*\* Department of Defense, Office of the Adjutant General
- \* Department of Education  
Department of Hawaiian Home Lands
- \* Department of Health
- \* Department of Labor and Industrial Relations
- Department of Land and Natural Resources  
Department of Land and Natural Resources, State Historic Preservation  
Officer
- Department of Transportation
- \* Office of Environmental Quality Control
- \* University of Hawaii, Environmental Center

- University of Hawaii, Marine Programs
- \* University of Hawaii, Water Resources Research Center (comments incorporated with those of the Environmental Center)
- Art Carter, Governor's Liaison for West Hawaii
- Gerald DeMello, Governor's Liaison for East Hawaii

**Hawaii County Agencies**

- Civil Defense Agency
- County Council
- \*\* Fire Department
- \* Department of Parks and Recreation
- Planning Commission
- \* Planning Department
- \* Police Department
- \* Department of Public Works
- Department of Research and Development
- \*\* Department of Water Supply
- Greg Mooers, Deputy Managing Director, West Hawaii

**Public Utilities**

- \* Hawaiian Electric Light Company, Inc.
- Hawaiian Telephone Company

**Community Organizations and Other Private Groups/Individuals**

- American Lung Association
- Tom Beach
- Dave DeCleene
- W.R. Glover
- Pat Godfrey
- \* Bill Graham, Life of the Land
- \* Judith Graham
- Marian Gushiken
- Bruce Habig, The First Boston Corporation
- \* Thomas Hagen, South Kohala Management
- William D. Heacox
- Ka Ohana O Kalae
- Adi Kohler and David Shackleton, Westin Mauna Kea
- H. Peter L'Orange, Hawaii Leeward Planning Conference
- Hugh R. Montgomery
- Office of Hawaiian Affairs
- \* Jacque Prell
- \* Jerry Rothstein, Save Hapuna Initiative Petition
- \* Robert Silverstein, Save Hawaii Foundation
- William T. Slattery
- Walt Southland
- Laura Libsohn-Spiegel
- \* Leon A. Thevenin, South Kohala Resort Advisory Committee (verbal comments)
- Jan Walker
- Pamela S. Washburn

F. Reeve Williams  
\* Glen M. Winterbottom  
Peter Young, Waimea-Kawaihae Community Association

**Libraries**

Bond Memorial Library, Kohala  
Hamilton Library, University of Hawaii  
Hilo Regional Library  
Kailua-Kona Library  
Kaimuki Regional Library  
Kaneohe Regional Library  
Legislative Reference Bureau  
Lihue Regional Library  
Thelma Parker Memorial Library/Waimea Area Library  
Pearl City Regional Library  
Wailuku Regional Library

**News Media**

Hawaii Tribune Herald  
Honolulu Advertiser  
Honolulu Star-Bulletin  
West Hawaii Today



UNITED STATES  
DEPARTMENT OF  
AGRICULTURE

SOIL  
CONSERVATION  
SERVICE

P. O. BOX 50004  
HONOLULU, HAWAII  
96850

RECEIVED  
NOV 4 1987

BELT COLLINS & ASSOCIATES

November 3, 1987



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
BUILDING 230  
FT. SHAFTER, HAWAII 96888 - 5440

RECEIVED  
OCT 23 1987

BELT COLLINS & ASSOCIATES

October 19, 1987

REPLY TO  
ATTENTION OF:

Planning Branch

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, HI 96720

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

Subject: Draft Environmental Impact Statement - South Kohala Resort,  
Island of Hawaii

We have no comments to offer at this time; however, we appreciate the  
opportunity of reviewing the draft EIS on subject project.

Sincerely,

ACTING

*Richard N. Duncan*

RICHARD N. DUNCAN  
State Conservationist

cc: William F. Mielcke, Mauna Kea Properties, Inc., P.O. Box 218, Kamuela, HI  
96743  
Anne L. Mapes, Belt, Collins & Associates, 606 Coral Street, Honolulu, HI  
96813

XIII - F

Thank you for the opportunity to review and comment on  
the Draft Environmental Impact Statement for the proposed  
South Kohala Resort. The following comments are offered.

a. The document drawings do not show any work falling  
under the regulatory jurisdiction of the U.S. Army Corps of  
Engineers. However, we would like an opportunity to examine  
detailed site plans before making final determination  
regarding the need for a Department of the Army permit for  
this project.

b. The discussion on page IV-4 concerning tsunami and  
flood hazards appears to be accurate. Figure IV-1 should  
show the Zone C areas cited in the last line of page IV-4.  
Also, it would be helpful to add the name of the stream to  
Figure IV-1.

Sincerely,

*Kisuk Cheung*

Kisuk Cheung  
Chief, Engineering Division

Copies Furnished:

Mr. William F. Mielcke  
Mauna Kea Properties, Inc.  
P.O. Box 218  
Kamuela, Hawaii 96734

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

**BELT COLLINS  
& ASSOCIATES**

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTTH 7-30474 • Fax (808) 538-7819  
Hawaii • Singapore • Australia • Hong Kong • Japan

December 16, 1987  
87-2460

Mr. Kisuk Cheung  
Chief, Engineering Division  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Building 230  
Fort Shafter, Hawaii 96858-5440

Dear Mr. Cheung:

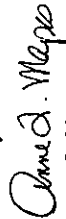
**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter to the Hawaii County Planning Department dated October 19, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your comments are as follows:

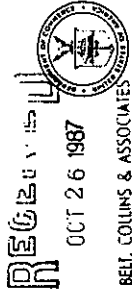
1. Site Plans. When they are completed, copies of the detailed site plans will be forwarded for examination by your office to make a final determination regarding the need for a Department of the Army permit.
2. Tsunami/Flood Hazards. Figure IV-1 will be revised in the Final EIS to show the Zone C areas. We checked the USGS quadrangle map of the area, and no name is indicated for the gulch shown in Figure IV-1.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



OCT 26 1987

BELT COLLINS & ASSOCIATES

**U.S. DEPARTMENT OF COMMERCE**  
National Oceanic and Atmospheric Administration  
**NATIONAL MARINE FISHERIES SERVICE**  
Southwest Region • Western Pacific Program Office  
2570 Dole St. • Honolulu, Hawaii 96822-2396

October 22, 1987

F/SWR1:JJN

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

Subject: Draft Environmental Impact Statement (DEIS),  
South Kohala Resort, South Kohala, Island of Hawaii.

XIII-5

The National Marine Fisheries Service (NMFS) has received and reviewed the subject DEIS for South Kohala Resort, South Kohala, Hawaii. The DEIS has been prepared to accompany an application to the County of Hawaii for a shoreline setback variance. We offer the following comments for your consideration in preparing the Final EIS.

General Comments

NMFS was pleased to note that the concerns outlined in our comment letter on the EIS Preparation Notice have been adequately addressed in the subject document. This letter, dated January 14, 1987, is included in Chapter XII (page XII-24) of the DEIS. Of particular benefit to us in our review of potential project impacts in the marine environment is the report in Appendix B of the DEIS entitled "A Second Baseline Assessment of the Marine Environment in the Vicinity of the South Kohala Resort, South Kohala, Hawaii."

The description of the proposed South Kohala Resort indicates no work will be conducted which will modify the shoreline or directly impact the coastal marine environment in any way. Potential impacts to nearshore resources will come only from secondary impacts which result from activities on land associated with resort development and operation. These have been adequately addressed in the DEIS.

Thank you for the opportunity to comment on the subject DEIS. Should there be any changes to the proposed project, particularly involving work in the nearshore coral reef environment, please contact Mr. John Naughton of my staff at 955-8831.



15  
OCT 22 1987

351 COLLINS & ASSOC.  
IN REALTY, REALTOR, INC.

ES  
Room 6307  
OCT 21 1987

United States Department of the Interior

FISH AND WILDLIFE SERVICE  
300 ALA MOANA BOULEVARD  
P. O. BOX 50187  
HONOLULU, HAWAII 96850



Sincerely yours,

*John E. Gates*  
John E. Gates  
Administrator

cc: F/SWR, Terminal Is., CA  
F/PR, Washington, D.C.  
Corps of Engineers, Honolulu  
FWS, Honolulu  
EPA, Region 9 (P-5)  
Hawaii State Div. of Aquatic Resources  
Mauna Kea Properties (Mr. William F. Mielcke)  
Belt Collins & Associates (Mr. Richard H. Van Horn)

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Re: Draft Environmental Impact Statement, South Kohala Resort,  
South Kohala, Hawaii

Dear Mr. Lyman:

We have reviewed the referenced Draft Environmental Impact Statement (EIS) and offer the following comments for your consideration.

General Comments

No construction activities that would directly affect nearshore marine habitats are planned for the proposed resort development at Hapuna Bay. There are no anchialine pools in the project area that would be affected by this development.

Specific Comments

a. Section 3.2. IV-6 - IV-9. The Final EIS should more thoroughly discuss the stormwater drainage design for the proposed resort development. To prevent degradation of nearshore coastal water quality and coral reef habitats, we recommend that the drainage system capture and retain stormwater runoff by using green areas, sediment retention basins, dry wells, and parks.

b. Appendix E. For your information, the ko'olou'ula (*Abutilon menziesii*), is an endangered species (51 FR 34415; September 26, 1986). This plant has not been recorded from the project site and the last documented collection for the Big Island was in 1971.

The most recent Notice of Review of plant taxa for listing as endangered or threatened species is Federal Register Volume 50 (188):39526; September 27, 1985.



**BELT COLLINS  
& ASSOCIATES**

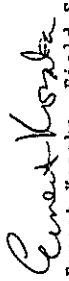
Engineering • Planning  
Landscape Architecture

606 Conal Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7330214 • Fax (808) 531-5361  
Hawaii • Singapore • Australia • Hong Kong

Re: South Kohala Resort

We appreciate the opportunity to comment.

Sincerely,

  
Ernest Kosaka, Field Supervisor  
Environmental Services  
Pacific Islands Office

cc: Mauna Kea Properties, Inc.  
v Belt, Collins and Associates  
OEQC  
NMFS - WPP0

Mr. Ernest Kosaka, Field Supervisor  
Environmental Services, Pacific Island Office  
Fish and Wildlife Service  
United States Department of the Interior  
300 Ala Moana Boulevard  
P.O. Box 50167  
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

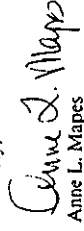
**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter dated October 21, 1987, to the Hawaii County Planning Department commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your specific comments are as follows:

1. **Drainage.** The Final EIS will contain further discussion of the stormwater drainage design for the proposed development. Where possible, the drainage system would include dry wells to dispose of stormwater, as well as retention basins and depressions in the golf course to store stormwater and sediment.
2. **Endangered Species.** Thank you for the update of information on the ko'oloa'ula. Although this plant was not found on the project site, its status as an endangered species is noted.

Thank you for your cooperation and assistance. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lymian, Hawaii County Planning Department



DEPARTMENT OF THE NAVY  
 COMMANDER  
 NAVAL BASE PEARL HARBOR  
 BOX 110  
 PEARL HARBOR, HAWAII 96860-5070  
 SEP 30 1987  
 REPLY REFER TO  
 5090  
 Ser NSB/2251

28 SEP 1987

Mr. Albert Lono Lyman, Director  
 County of Hawaii Planning Department  
 25 Aupuni Street  
 Hilo, Hawaii 96720

Dear Mr. Lyman:

DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)  
 SOUTH KOHALA RESORT

The Draft EIS for the South Kohala Resort has been reviewed and we have no comments. Since we have no further use for the EIS, it is being returned to the Office of Environmental Quality Control.

Thank you for the opportunity to review the Draft.

Sincerely,

T. L. FERRIER  
 Captain U.S. Navy  
 Chief of Staff

Enclosure

Copy to:  
 Mr. William F. Mielcke  
 Mauna Kea Properties, Inc.  
 P. O. Box 218  
 Kamuela, Hawaii 96743

Ms. Anne L. Mapes  
 Belt, Collins & Associates  
 606 Coral Street  
 Honolulu, Hawaii 96813

Office of Environmental Quality Control

REPRODUCED AT GOVERNMENT EXPENSE

Mr. Albert Lono Lyman  
 Director  
 Planning Department  
 County of Hawaii  
 25 Aupuni Street  
 Hilo, Hawaii 96720

Dear Mr. Lyman:

Subject: Draft Environmental Impact Statement  
 South Kohala Resort

We have reviewed the subject document and have no comments to offer.

Very truly yours,

*T. L. Ferrier*  
 TEUVANE TOMINAGA

State Public Works Engineer

EM:jk  
 cc: Mr. William F. Mielcke  
 Ms. Anne L. Mapes

SEP 29 1987

JOHN WAIHEE  
GOVERNOR



SUZANNE D. PETERSON  
CHAIRPERSON, BOARD OF AGRICULTURE  
DEPUTY TO THE CHAIRPERSON

State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 So. King Street  
Honolulu, Hawaii 96814-2512

Mailing Address:  
P. O. Box 22159  
Honolulu, Hawaii 96822-0159

November 9, 1987

DISC  
NOV 11 1987

6611 COLLINS & ASSOCIATES

MEMORANDUM

To: Mr. A. Lono Lyman, Director  
Planning Department, County of Hawaii

Subject: Draft Environmental Impact Statement (DEIS) for  
Proposed South Kohala Resort  
Mauna Kea Properties, Inc.  
TMK: 6-2-01: por. 51  
6-2-02: 12  
6-6-02: 37 South Kohala, Hawaii  
Acres: 489

The Department of Agriculture has reviewed the subject DEIS and has the following comments to offer.

According to the subject document, the applicant seeks to develop a self-contained resort community. The subject DEIS has been prepared to accompany an application by the applicant to the County of Hawaii Planning Department, requesting a shoreline setback variance.

On January 13, 1987, we submitted comments on the EIS Preparation Notice for the subject project to Ms. Anne L. Mapes (a copy was also sent to you) and concluded that the proposed resort will not adversely impact the agricultural resources of the area. We note that the EIS Preparation Notice included the following TMKs (6-2-02: 12 & 13, 6-6-02: 37 & 38, totaling 540 acres) which are different from those covered by the present DEIS. TMK 6-2-02:13 and 38 is not part of this DEIS in support of the shoreline setback variance.

Prior to our comments on the EIS Preparation Notice, we reviewed and commented on a petition for an amendment to the State Land Use Agricultural District (AS4-574, TMK 6-2-01: 51, 62, 63, 78 and 79, totaling 399 acres) located mauka of the Queen Kaahumanu Highway. This petition received incremental approval by the State Land Use Commission in February, 1985.

Mr. A. Lono Lyman  
November 9, 1987  
Page "2"

It appears that the approval and development of the proposed resort will not adversely impact the agricultural resources of the area.

Thank you for the opportunity to comment.

SUZANNE D. PETERSON  
Chairperson, Board of Agriculture

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Ms. Anne L. Mapes, Belt, Collins & Associates  
OEQC

JOHN W. HISE  
GOVERNOR  
ROGER A. ULVEING  
DIRECTOR  
MURRAY E. TOMVILL  
DEPUTY DIRECTOR  
BARBARA KIM STANTON  
DEPUTY DIRECTOR

DEPARTMENT OF BUSINESS  
AND ECONOMIC DEVELOPMENT

MAKOAALO BUILDING, 30 SOUTH KING ST. HONOLULU, HAWAII  
PHONE: 469-2828 FAX: 469-2828 TELETYPE: 469-2828



Ref. No. P-7591

November 9, 1987

The Honorable Albert Lono Lyman  
Planning Director  
Planning Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

Subject: South Kohala Resort Draft Environmental Impact Statement

We have reviewed the subject draft environmental impact statement (EIS) and have the following comments.

1. The final EIS should clearly address the proposed project's compliance with the Land Use Commission's (LUC) conditional reclassification of the subject property. As we stated in our EISP comments of January 7, 1987, (reprinted on pages XII-31 and XII-32), the EIS should address the project's development schedule as it relates to the LUC's incremental approval for reclassification of the project area. Phase I, encompassing approximately 317 acres has been reclassified to the Urban District. Upon compliance with the conditions imposed by the Commission, Phase II encompassing the remaining 82.33 acres will be reclassified from the Agricultural to the Urban District.

The incremental restricting of the subject property is subject to the following conditions: 1) Petitioner shall provide housing opportunities for low and moderate income Hawaii County residents and employees with ten percent (10%) of the residential units to be developed on Phase I and II, and 2) Phase II will be reclassified to the Urban District upon a showing of substantial progress and completion of Phase I and development of the proposed hotel. The Development Schedule, Table II-12 should confirm this requirement. The LUC's determination of substantial compliance should also be listed on page I-9, Necessary Approvals and Permits.

2. Appendix C should address whether the combination of fertilizers and waste water effluent used for irrigation of the golf course will impact the quality of subsurface and surface waters.

The Honorable Albert Lono Lyman  
Page 2  
November 9, 1987

Appendix C assumes that the existing Mauna Kea Golf Course turf management practices will be comparable with those of the proposed golf course, but does not indicate whether the Mauna Kea Golf Course is irrigated with treated waste water as proposed for the South Kohala Resort Golf Course.

3. The final EIS should provide additional information to indicate the ultimate source capacity of the Lalamilo wells and discuss whether the projected cumulative potable water demand can be met by these wells in the future. Possible alternate water sources should also be listed in the final EIS.

4. The market study should determine whether the combination of two large resort projects adjacent to a very popular State Park (Hapuna Beach) will result in oversaturation or congestion in the area and negatively impact the character and therefore, marketability of the area.

5. Hawaii Coastal Zone Management policies call for providing public access to and along shorelines with recreational value. The proposal to clear the project's shoreline area of Kiawe brush and re-plant the area should be undertaken in a manner which recognizes possible seasonal fluctuations in the location of the shoreline from which the 40-foot setback is measured. The FEIS should provide more detail concerning the proposed landscaping and other improvements and the possibility of their encroaching on public lands and access to and along the shoreline.

Thank you for the opportunity to comment.

Sincerely,

*Roger A. Ulveing*  
Roger A. Ulveing

December 16, 1987  
87-2577

Mr. Roger A. Ulveling, Director  
Department of Business and Economic Development  
State of Hawaii  
P.O. Box 2359  
Honolulu, Hawaii 96804

Dear Mr. Ulveling:

**South Kohala Resort Environmental Impact Statement (EIS)**

The Hawaii County Planning Department has forwarded a copy of your letter dated November 9, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. We received the letter on December 2, 1987. Our responses to your comments are as follows.

1. State Land Use. Section 1.0, State Land Use Law, in Chapter VI, will be modified in the Final EIS to include the following:

"On May 6, 1985, the State Land Use Commission reclassified approximately 317 acres of land from the Agricultural District to the Urban District as part of Increment I ("Phase I" in the Decision and Order). These lands will contain 16 holes of the golf course and approximately 150 units of single-family housing and/or condominium units. The second increment ("Phase II") of the development was approved for incremental redistricting and consisted of approximately 82 acres. Redistricting of Increment II from the Agricultural to the Urban District was to be granted upon a showing of substantial progress and completion of Increment I and development of the Applicant's resort hotel adjacent to Hapuna Beach. In addition to incremental redistricting, the only condition to the approval is that the applicant provide housing opportunities for low and moderate income Hawaii County residents and employees equivalent to 10 percent of the number of residential units to be developed in Increments I and II on the property. Alternatively, development of such housing may be outside of the property.

The original project development schedule called for substantial completion of Increment I and the hotel by 1990. This schedule was predicated upon obtaining the necessary County permits by 1987. Although diligently pursued, these County permits have not yet been obtained. Mauna Kea Properties, Inc. submitted applications for Special Management Area (SMA) use permits, rezoning, Shoreline Setback Variance (SSV), and Planned Unit Development (PUD) to the County of Hawaii in June, 1985. The application for SSV was later withdrawn. After a lengthy contested case proceeding, Mauna Kea Properties received its SMA permits in January 1986. However, the granting of both permits was appealed to the Third Circuit Court and a separate lawsuit was initiated concerning the issuance of a negative declaration on the project. Although the court upheld the permit and the negative declaration, appeals were taken to the Hawaii Supreme Court in 1986. Rather than engage in further litigation, Mauna Kea Properties submitted a revised application for shoreline setback variance in November 1986, and a determination was made that the preparation of an environmental impact statement was required.

Mr. Roger A. Ulveling  
December 16, 1987  
Page 2

Mauna Kea Properties now anticipates having the necessary County land use permits for the project by late 1988. Construction of the golf course is planned to begin in 1990 and be completed in 1992, that of the hotel to begin in 1990 and be completed in 1993. Increment I will be substantially complete in 1994 or 1995. An extension of the incremental redistricting for Increment II may be necessary and would be sought from the State Land Use Commission.

2. Golf Course Irrigation. The combination of fertilizers and wastewater effluent used to irrigate the golf course will have little or no impact on the quality of subsurface and surface waters. It should be noted that, if it is used, only a small amount of treated effluent would be available for irrigation, particularly during the early stages of development, and it would be mixed with brackish water to provide enough water to irrigate the golf course. The amount of nutrients remaining in the effluent after treatment will be negligible, and furthermore, the effluent will be chlorinated at the wastewater treatment plant prior to being used for irrigation purposes. Finally, Chang and Young's study showed that almost all of the nutrients are taken up by the grass and upper soil level before the water even gets to the underlying material.

In reply to your inquiry, the Mauna Kea golf course is not irrigated with treated wastewater. There is not enough effluent to irrigate the entire golf course. However, according to Ray Seaver, Director of Engineering at the Westin Mauna Kea, some effluent has been used to irrigate kiawe and rough grass at the Mauna Kea Resort.

The applicant has considered the use of treated effluent at the South Kohala Resort for golf course irrigation to conserve water. It is hoped that given the assurances above, your department will support this conservation measure.

3. Water. The present supply capacity of the three Lalamilo wells and related pipelines and tank improvements is 2.44 mgd. This supply is allocated as follows: 1.0 mgd to Mauna Kea Properties, 1.0 mgd to Mauna Lani Resort, and 0.44 mgd to the County. A fourth well has been drilled but has not yet been added to the system. It would increase supply capacity to 3.88 mgd. Five additional well sites have been purchased by Mauna Lani Resort on private land in the Lalamilo area. By 1993, when the first phase of construction for South Kohala Resort is completed, more water may be available from an expanded Lalamilo system. However, because of competition from other users, it may not be available to South Kohala Resort. Therefore, another source will have to be developed to accommodate the total project, scheduled for completion in 1998.

In 1981, BCA conducted a study of groundwater resources in an 85-square-mile area which includes the watershed above Waimea, a portion of the South Kohala plain, and the coastline from Kawaihae to Puako (Nance, T. November 1981). A proposal to develop groundwater for domestic use at Puukawaiwai, South Kohala, Hawaii. Conclusions of the study were as follows:

- o The amount of groundwater recharge is estimated to be 24 mgd.
- o Allowing for some expansion of the County's surface water system in Waimea, the streamflow component of the recharge may be reduced to about 20 mgd as the long-term regional groundwater recharge.



Mr. Roger A. Ulveling  
December 16, 1987  
Page 3

- o Groundwater development should be limited to a maximum of two-thirds of recharge or 13 mgd to preserve the integrity of the basal lens in South Kohala.
- o Upon completion of planned expansions of the Lalamilo water system and private, nearshore brackish water irrigation systems are completed, total groundwater pumpage will be 6-7 mgd; this will leave approximately 6 mgd that can be safely developed in addition to planned expansions.
- o A site at Pūkaewai along the Waimea-Kawaihae Road (at an elevation of about 1,250 feet) was recommended for new potable wells. This is the best location from the standpoint of installation cost and operational flexibility.

Hence, current and foreseeable pumpage amount to a fraction of the total groundwater recharge, meaning that more pumpage could be maintained without threatening the integrity of the groundwater supply. The implications are that potable water sources are available for future developments such as South Kohala Resort, in the region.

4. Marketability. You state that "The market study should determine whether the combination of two large resort projects adjacent to a very popular State Park (Hapuna Beach) will result in oversaturation or congestion in the area and negatively impact the character and therefore, marketability of the area." Your statement seems to encompass two circuitous suppositions: first, that the Mauna Kea Resort and South Kohala Resort might be the cause of oversaturation and congestion, and second, that this congestion caused by the resorts would have a negative impact on their own marketability as resorts.

The market analysis for the proposed South Kohala Resort was completed by Ming Chew Associates for Mauna Kea Properties, Inc. in May 1987, and no other market study is planned. The impact of South Kohala Resort on Hapuna Beach and that of the beach on the resort were considered in preparing the market analysis. In Ming Chew's opinion, the impact on the marketability of the Mauna Kea Resort/South Kohala Resort area as a result of congestion at the adjacent Hapuna Beach would not be any less than that reflected in the market analysis forecast.

You seem to imply that proximity to a popular well-used beach (by both residents and visitors) might be detrimental to the marketability of the two resorts. In our opinion, guests at the Westin Mauna Kea would most likely not be affected by increased use of Hapuna Beach. The Westin Mauna Kea has various recreational amenities onsite such as a golf course, tennis courts, and a swimming pool and deck. Those guests who choose to use the beach stay at Kaunaoa Bay beach, adjacent to the hotel; future guests are expected to do likewise.

The marketability of the South Kohala Resort will be enhanced, not diminished by proximity to Hapuna Beach. In Ming Chew's opinion, so long as a destination resort can distinguish itself onsite, with attractive self-contained guest amenities, it can maintain its marketability. Although use of the white sand beach adjacent to the resort hotel is expected to increase due to hotel and other development on the island, the proximity of the beach will nevertheless enhance the attractiveness of the hotel. As Hapuna Beach State Park becomes more crowded, so will other parks and beaches in the region, in the county, and statewide; therefore, if beach congestion is a marketability factor, other Hawaii resorts will be similarly affected. Furthermore, in comparison with other resorts worldwide, in terms of beach attractiveness, safety, and other competitiveness factors, Hawaii resorts such as the proposed South Kohala Resort would, according to Ming Chew, find themselves in a favorable position.

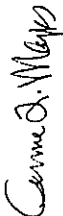
Mr. Roger A. Ulveling  
December 16, 1987  
Page 4

5. Landscaping/Public Access. Public access will be provided as shown on the revised hotel concept plan in the Final EIS. The Final EIS will also include a landscape concept plan.

Please note that the certified shoreline from which the 40-foot setback is measured does not fluctuate, although the high water mark does fluctuate according to tide and season. The developer will trim kawe and introduce new vegetation only mauka of the certified shoreline, on property it owns and not on public lands. Landscaping and other improvements will not encroach on public lands or on access to and along the shoreline.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,



Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

SEP 24 1987

John Waihee  
GOVERNOR

Marvin T. Miura, Ph.D.  
DIRECTOR

TELEPHONE NO.  
548-8815



STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

445 SOUTH KING STREET, ROOM 104  
HONOLULU, HAWAII 96813

September 22, 1987



STATE OF HAWAII  
Department of Business and Economic Development  
Housing Finance and Development Corporation

P. O. BOX 17067  
HONOLULU, HAWAII 96817

November 9, 1987

87:PLMG/4836JT

IN REPLY REFER

To:

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Re: Draft Environmental Impact Statement (EIS) for  
the Construction of Shoreline Improvements at the  
Proposed South Kohala Resort

Dear Mr. Lyman:

We have reviewed the subject draft EIS and have no comments relative to the developer's request for a shoreline setback variance. However, the report mentions that Mauna Kea Properties "would consider participating in the proposed Kealahou project near Kona" in order to satisfy any additional housing requirements should the expansion of Kawaihae Village be inadequate. As the land developer of Kealahou, we are willing to entertain proposals which provide for affordable housing. Perhaps discussions between the developer, the county and our agency involving development options should commence as soon as practical in order to resolve this employee housing issue.

Thank you for the opportunity to review the subject draft EIS.

Sincerely,

ORIGINAL SIGNED

RUSSELL N. FUKUMOTO  
Acting Executive Director

cc: Mr. William F. Mielcke, Maunakea Properties, Inc.  
Ms. Anne L. Mapes, Belt, Collins & Associates

Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) that was prepared pursuant to Chapter 343, Hawaii Revised Statutes and Chapter 11-200, Administrative Rules, EIS Rules:

TITLE: South Kohala Resort  
LOCATION: South Kohala, Hawaii  
CLASSIFICATION: Applicant Action

Your comments or acknowledgments of no comments on the EIS are welcomed. Please submit your reply to the accepting authority or approving agency:

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Please send a copy of your reply to the proposing party:

Mr. William F. Mielcke AND Ms. Anne L. Mapes  
Mauna Kea Properties, Inc. Belt, Collins & Associates  
P.O. Box 218 606 Coral Street  
Kamuela, Hawaii 96743 Honolulu, Hawaii 96813

Your comments must be received or postmarked by: November 9, 1987.

If you have no further use for this EIS, please return it to the Office of Environmental Quality Control.

Thank you for your participation in the EIS process.

No comments  
Engy Division  
9/29/87

JOHN L. WEAVER  
GOVERNOR

SEP 30 1987

CHUCKER T. TOGUCHI  
SUPERINTENDENT



OCT 19 1987

BEIT, COLLINS & ASSOCIATES

STATE OF HAWAII  
DEPARTMENT OF DEFENSE  
OFFICE OF THE ADJUTANT GENERAL  
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4855

STATE OF HAWAII  
DEPARTMENT OF EDUCATION

P. O. BOX 2246  
HONOLULU, HAWAII 96804

September 29, 1987

October 5, 1987

OFFICE OF THE SUPERINTENDENT

Engineering Office

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Mr. Albert L. Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

Dear Mr. Lyman:  
SUBJECT: South Kohala Resort

South Kohala Resort  
South Kohala, Hawaii

Thank you for providing us the opportunity to review the above subject project.

We have no comments to offer at this time regarding this project.

Yours truly,

signed

Jerry M. Matsuda  
Major, Hawaii Air  
National Guard  
Contr & Engr Officer

cc: Mauna Kea Properties, Inc.  
Beit, Collins & Associates

Our review of your proposed 560 single and multi-family housing units indicates that it will have the following enrollment impact on our area school.

| SCHOOL              | GRADE | APPROXIMATE ENROLLMENT |
|---------------------|-------|------------------------|
| Waimoa Elem./Inter. | K-8   | 15 - 25                |
| Honokaa High        | 9-12  | 0 - 10                 |

Schools at all levels in this service area are operating at capacity. Budgeting for additional classrooms will be necessary to accommodate the anticipated enrollment growth.

Please keep us informed of any changes so that we may be able to adjust to changing needs.

Sincerely,

*Charles T. Toguchi*  
Charles T. Toguchi  
Superintendent

CIT:J1 (MRI)

cc E. Imai, OBS  
W. Mielcke, Mauna Kea Prop.  
A. Mapes, Beit Collins

December 16, 1987  
87-2462

Mr. Charles T. Toguchi, Superintendent  
Department of Education  
State of Hawaii  
P.O. Box 2360  
Honolulu, Hawaii 96804

Dear Mr. Toguchi:

**South Kohala Resort Environmental Impact Statement (EIS)**

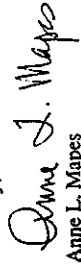
We have received a copy of your letter dated October 5, 1987, to the Hawaii County Planning Department commenting on the Draft EIS for the proposed South Kohala Resort.

We had estimated an enrollment impact of approximately 20 elementary/intermediate students and 10 high school students from the 560 housing units. These estimates are consistent with the figures given in your letter.

Your statement that schools at all levels in the region are operating at capacity and that additional classrooms will be necessary to accommodate the anticipated growth confirms the information contained in the Draft EIS.

May we express our thanks and appreciation to your staff for their responsiveness in providing the data needed for the analysis of impacts on the schools.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

RECEIVED  
NOV 19 1987



**STATE OF HAWAII**  
**DEPARTMENT OF HEALTH**  
P. O. BOX 319  
HONOLULU, HAWAII 96809

November 6, 1987

**MEMORANDUM**

To: Mr. Albert Lono Lyman, Director  
Planning Department, County of Hawaii

From: Deputy Director for Environmental Health

Subject: Draft Environmental Impact Statement for South Kohala Resort,  
South Kohala, Hawaii

Thank you for the opportunity to review the draft environmental impact statement for the South Kohala Resort. We provide the following comments:

Drinking Water

The resort development plans to obtain potable water from the Department of Water Supply Lalamilo wells. It is projected that there will be a sufficient water supply for the South Kohala Resort from the existing county system through 1993. As additional residential units are constructed, a new water source will need to be developed to supplement the Lalamilo supply.

Please be aware that use of this source of water will require compliance with the State's Drinking Water rules, Chapter 20, Title 11, Administrative Rules.

Section 11-20-29 of Chapter 20 requires all new sources of potable water serving public water systems to be approved by the Director of Health prior to their use to serve potable water. Such approval is based primarily upon the satisfactory submission of an engineering report which adequately addresses all concerns as set down in Section 11-20-29. The engineering report must be prepared by a registered professional engineer and bear his or her seal upon submittal.

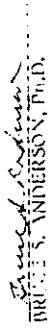
Should you have any questions regarding Chapter 20, Title 11, Administrative Rules, please contact the Drinking Water Program at 548-2233.

Wastewater Disposal

Provisions should be made to ensure proper buffering between areas irrigated with treated wastewater and the proposed residential development.

**COPY**

IN REPLY, PLEASE REFER TO:  
EPHSD

  
BRUCE S. ANDERSON, Ph.D.

cc: Chief Sanitarian, Hawaii  
Mr. William F. Mielcke  
Ms. Anne L. Mapes

**BELT COLLINS  
& ASSOCIATES**

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Landscape Architecture

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Hawaii • Singapore • Australia • Hong Kong • Japan

December 16, 1987  
87-2463

Dr. Bruce S. Anderson  
Deputy Director for Environmental Health  
Department of Health  
State of Hawaii  
P.O. Box 3378  
Honolulu, Hawaii 96801

Dear Dr. Anderson:

**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter dated November 6, 1987, to the Hawaii County Planning Department commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your comments are as follows:

1. **Drinking Water.** The Draft EIS disclosed the need to develop a new water source to supplement the Lalamilo supply as additional residential units are developed beyond 1993. The project will be conducted in compliance with the State's drinking water rules.
2. **Wastewater Disposal.** Proper buffering between the proposed residential units and areas irrigated with treated wastewater will be provided. Condition 7 imposed upon SMA Use Permit (SMA 85-16) states: "All proposed buildings shall observe a minimum setback of 100 feet from the edge of the fairways/greens/tee area of the abutting golf course."

During the early stages of development, only a small amount of treated effluent will be available for irrigation, and it will be mixed with brackish water to provide enough water to irrigate the golf course. Moreover, the likelihood of the effluent posing any hazards to residents will be extremely low due to the fact that it will be chlorinated at the wastewater treatment plant prior to being used for irrigation purposes. Sufficient precautions will be taken to minimize the probability of malfunction in the proposed resort's waste treatment system, including the installation of backup pumps and an emergency power generator. Plant operation procedures, such as the daily monitoring of effluent to detect any discharge of micro-organisms, will provide additional margins of safety against the release of pathogens at unacceptable levels into the environment.

It should be noted that the Hawaii County Planning Department has, in the past year, required developers to implement a water monitoring program as a condition of Special Management Area (SMA) permit approval. This condition constitutes a mitigation measure for water quality control.

Dr. Bruce S. Anderson  
December 16, 1987  
Page 2

The applicant has considered the use of treated effluent for golf course irrigation to conserve water. It is hoped that given all the precautions outlined above, your department will support this conservation measure.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

WILLIAM W. PATT, CHAIRMAN  
BOARD OF LAND AND NATURAL RESOURCES  
LIBERT K. LANGRISH  
GOVT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 521  
HONOLULU, HAWAII 96853

DOC. NO.: 20909  
FILE NO.: 88-153

DEC 3 1987

Honorable Albert Lono Lyman, Director  
County of Hawaii  
Planning Department  
25 Apunui Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

SUBJECT: DRAFT EIS - SOUTH KOHOLA RESORT  
TMK: 6-2-2: 12; 6-8-2: 37; 6-2-1: port. 51

Thank you for the opportunity to review the Draft EIS for the project above. We offer the following comments:

**HISTORIC SITES SECTION CONCERNS:**

This Draft EIS no longer considers TMK 6-2-2: 13 and 6-6-02: 38 in coastal areas; these are now future development areas. Given this change, we agree that all historic sites are likely to have been found. (There is no site location map in Chapter IV or in the archaeological report that is appended, however. It might be useful to insert one in the Final EIS.) We agree with the significance assessments as reported in the Draft EIS in Table IV-10. We agree with the mitigation plan, if one condition is met -- as stated in our June 4, 1987 letter to Dr. Paul Rosendahl, the applicant's consulting archaeologist. This condition is:

The details of the preservation plans for the 2 significant sites to be preserved (5629 and Trail 9) will be reviewed and approved by the County Planning Department and the State's Historic Sites Section prior to actual development of these sites. Review of items such as buffer zones, text, etc. will ensure proper and accurate preservation.

Additionally, as covered in our June 4, 1987 letter and in our June 9, 1987 meeting with Belt Collins representatives and Dr. Rosendahl, we would like to urge that the following item be adopted as part of the mitigation plan.

A detailed interpretive report on land use in Ouli over time be prepared. Given the considerable amount of archaeological work in coastal Ouli, topics such as permanent housing, demographics, social organization, temporary housing, subsistence, and

JOHN WAHNEE  
GOVERNOR OF HAWAII

DEC 10 1987



STATE OF HAWAII  
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
808 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

October 7, 1987

Ms. Anne L. Mapes  
Belt, Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

The Department of Labor and Industrial Relations has received the Draft Environmental Impact Statement for the proposed South Kohala Resort. We realize the impact as large as this will have on the demand for employees during the construction and operational periods. Again, the department would like to offer any assistance in recruiting job applicants to fill these demands through our various employment and training agencies.

Thank you for providing us the opportunity to review the draft EIS.

Sincerely,  
  
MARIO H. RAMIL  
Director

coastal-inland land use in Ouli should be able to be addressed in much more detail. Such an interpretive report would enable the public and the resort owners to fully benefit from the archaeology. Usually a substantial interpretive discussion is produced as part of the final product of archaeological fieldwork or laboratory work. It simply would involve a more detailed interpretation of the findings.

#### RECREATION CONCERNS:

Several of the recreation concerns identified in the Department's February 19, 1987 comments on the EIS Preparation Notice for the subject proposal have not been addressed in the Draft EIS.

Will the property boundary between Hapuna Beach State Recreation Area and the subject property be fenced and/or screened with plantings? If so, what type of fence and plantings will be used.

Will public access be allowed into the resort area from the public beach fronting the resort? What sort of barriers, if any, will discourage public use of resort facilities?

How will the beach fronting the subject property be managed? Will the sand be cleaned by the resort operators? Will the resort operators provide lifeguard services?

The Draft EIS identifies potential impacts of the South Kohala Resort on the use of Hapuna Beach and lists some means of minimizing intrusions or inequities. These measures are acceptable but incomplete unless the questions listed above are answered. New public beach parks do not mitigate the need for coordinated management of Hapuna Beach.

The statements attributed to Wayne Souza (p.V-140, 6.2.1.4.3) have been taken out of context and are incorrect. The purpose of the inventory was not to identify possible beach park sites and it was not focused on areas surrounded by substantial amounts of State-owned lands.

The purpose of the statewide inventories was to identify, map, and evaluate the principal coastal recreation resources to serve as a decisionmaking tool for administrators and planners, as well as land use planners and regulators, and other agencies and persons involved in the planning allocation of coastal resources. Among other things, the inventories will be used to identify potential coastal recreation parks.

For the last 15 years or so several coastal areas in West Hawaii have been proposed for park status. These areas - Hapuna and Wailea Beaches, Kiholo Bay, Kua Bay, Mahaiula Bay, and the Honomaliino-Manuka Coastline - have been singled out because of their high coastal recreation potential and because most of the lands surrounding these recreation resources are State-owned.

Figure V-8 is map of recreational facilities in North Kona, South Kohala, and North Kohala; not West Hawaii. Some state parks in the mapped area are missing and nomenclatures are wrong.

We note that one recommendation of the South Kohala Resort Advisory Committee for upgrading our parks would be to tie our raw sewage disposal into the new resort system. Figure V-7 indicates the layout of the sewage collection system takes this recommendation fairly convenient and we would like to have the opportunity to tie into the resort system.

#### AQUATIC RESOURCES CONCERNS:

The applicant's DEIS has addressed adequately most of our concerns regarding drainage water, wastewater disposal, agricultural herbicides/pesticides and nutrient loading. Additionally, the DEIS has described provisions for public controversy over use conflicts at Hapuna Beach Park may still exist.

Although no shoreline improvements or modifications are proposed at this time, future activities that may affect or impact aquatic resource values should be submitted to the Department for review.

Thank you for considering our concerns.

Very truly yours,

William W. Pacy, Chairperson  
Board of Land and Natural Resources

cc: Mr. William F. Mielcke  
Ms. Anne L. Mapes

**BELT COLLINS  
& ASSOCIATES**

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December 17, 1987  
87-2584

Mr. William W. Paty, Chairperson  
Board of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

Dear Mr. Paty:

**South Kohala Resort Environmental Impact Statement (EIS)**

The Hawaii County Planning Department has forwarded a copy of your letter dated December 8, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. We received the letter on December 10th. Our responses to your comments are as follows:

1. **Historic Sites Section Concerns.** We agree with your suggestion that an interpretive report synthesizing the work done in coastal Oahu should be prepared at the appropriate time. Most of the potentially significant sites are to be found in the area formerly referred to as "The Bluffs," which is no longer part of the subject project. In fact, most of the Kaunaloa Complex identified in the EIS is located in The Bluffs site. Therefore, it seems that the appropriate time to proceed with a detailed interpretive report would be when a decision is made to develop this site. At that time, we will be able to address all of the archaeological findings as a whole rather than focusing on separate parcels.

2. **Recreation Concerns.**

**Property Boundary.** The property boundary between Hapuna Beach State Recreation Area and South Kohala Resort will be screened with landscaping. Much of the existing kiawe and other vegetation at the boundary will be retained. A landscape concept plan will be included in the Final EIS.

**Public Access to the Resort.** The public will have access to public areas of the resort from the beach fronting South Kohala Resort. Signs will identify private facilities which are not open to the general public, such as the tennis courts and beach club, as well as service areas that are accessible to staff only.

**Beach Management.** Hapuna Beach is public land under State jurisdiction, and the Department of Land and Natural Resources has ultimate responsibility in this area. South Kohala Resort cannot actually "manage" the beach but can take reasonable measures to ensure that its guests and residents use Hapuna's shoreline resources both wisely and safely. Hotel beach attendants will be present to assist resort guests and residents. As is the case at the Westin Mauna Kea, the beach attendants at South Kohala resort will be trained in water safety, advanced first aid, and CPR, although they will not serve as lifeguards. It is our understanding that the

Mr. William W. Paty  
December 17, 1987  
Page 2

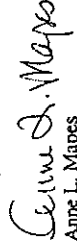
State will soon be contracting with a concessionaire to provide lifeguard services on Hapuna Beach. By their presence near the beach, the hotel beach attendants will most likely be available to assist the official lifeguards as the need arises. With regard to keeping the beach clean, the resort operator will clean the sand fronting the hotel, as appropriate.

**Coastal Recreation Inventory.** The section in Chapter V of the EIS referred to in your letter will be corrected to accurately describe DLNR's efforts to identify, map, and evaluate the principal coastal recreation resources in the state.

**Map of Recreational Facilities.** The title of Figure V-8 has been revised in the Final EIS according to your suggestion. It is stated in the text that the map shows selected recreational facilities; this map is not meant to be totally comprehensive.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



DEC 8 1987  
BELL, COLLINS & ASSOCIATES

Mr. Albert Lono Lyman  
Page 2

STP 8.2458

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION

STP 8.2458

November 18, 1987

Mr. Albert Lono Lyman, Director  
Planning Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

Draft Environmental Impact Statement  
South Kohala Resort  
South Kohala, Hawaii

We have the following comments on the proposed South Kohala Resort development:

1. On pages V-92 and V-93, "Probable Impacts on Roadways and Traffic": The trip generation for various proposed developments along Queen Kaahumanu Highway derived from traffic counts taken at the entrance to Mauna Lani and Mauna Kea Resorts on January 21, 1987 should yield the same end results as those made in the Final EIS of the Ritz-Carlton Mauna Lani Resort (Pg. IV-128) since the same traffic counts were used for both developments. The AM and PM peak hour trip generation for the 1993 South Kohala Resort and the 1998 Kohala Ranch development shows significant differences between this EIS and the Ritz-Carlton Final EIS.
2. The "Conclusions and Mitigation Measures" of the Resort's Traffic Impact Analysis on page V-97 should include the mitigation measures for the intersection at Queen Kaahumanu Highway and the proposed development's access road. We will require a fully channelized intersection and street lighting. Since we may also require future traffic signals when warranted, the developer should install the necessary ductlines.

3. We will require a written confirmation from the developer, assuring us that they will be monitoring the traffic situation at this development's access Road/Queen Kaahumanu Highway intersection periodically to determine if any additional future traffic improvements will be required and that the developer, at the appropriate time, will provide these improvements at his expense.
4. Any work within the State highway right-of-way will be subject to review and approval by the Highways Division and all cost for improvements to be borne by the developer.
5. We ask that the developer dedicate a 60-foot road reserve on each side of the Queen Kaahumanu Highway right-of-way for future highway widening.
6. The developer should be informed that we are seriously concerned about the effects of developments such as South Kohala Resort on downstream sections of our highway system. Consequently, we will be considering methods to obtain developer assistance to fund needed improvements.
7. We were unable to locate Figure IV-13 which was referred to on page V-92. Should it have read Figure V-5?
8. Detailed drainage studies will be required for adequacy of each culvert crossing at a later stage of this proposed development.

Thank you for this opportunity to provide comments.

Very truly yours,

*Edward Y. Hirata*  
Edward Y. Hirata  
Director of Transportation

**BEIT COLLINS  
& ASSOCIATES**

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December 17, 1987  
87-2583

Mr. Edward Y. Hirata, Director  
Department of Transportation  
State of Hawaii  
869 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Mr. Hirata:

**South Kohala Resort Environmental Impact Statement (EIS)**

The Hawaii County Planning Department forwarded a copy to us of your letter to Mr. Lyman, dated November 18, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. We received the letter on December 8, 1987. Our responses to your comments are as follows.

1. **Traffic Generated by Various New Projects.** The Final EIS for the Ritz-Carlton Mauna Lani project was published in July 1987, the Draft EIS for the South Kohala Resort project in September 1987. The same traffic counts taken at the entrance to Mauna Lani Resort and Mauna Kea Resort were in both reports. However, between July and September, assumptions as to future regional development were refined and changes made to projections; hence the differences in peak hour trip generation for the South Kohala Resort and Kohala Ranch.
2. **Mitigation Measures.** In the "Conclusions and Mitigation Measures" section of the Draft EIS, we state that "mitigation measures include the addition of roadway lanes and the construction of intersection improvements, as well as measures not directly related to roadways." These are possible mitigation measures for the intersection at Queen Kaahumanu Highway and the proposed resort access road. The developer is already obligated to comply with the requirements you mention.
3. **Traffic Monitoring.** Traffic will be observed at the intersection of Queen Kaahumanu Highway and the proposed resort access road.
4. **Work Within the State Right-of-Way.** The developer will submit for your review and approval all work within the State highway right-of-way.
5. **Dedication of a 60-Foot Road Reserve.** There is room mauka of the highway to dedicate a 60-foot road reserve. Existing homes makai of the highway make it difficult to dedicate such a reserve makai of the highway.
6. **Developer Assistance in Highway Improvement Funding.** We are cognizant of your concerns and the developer agrees to work with your department and other government agencies in providing improvements.

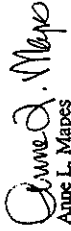
Mr. Edward Y. Hirata  
December 17, 1987  
Page 2

7. **Figure Showing Count Stations.** Figure V-5 was mistakenly referred to as Figure IV-13 in the Draft EIS. A correction will be made in the Final EIS.

8. **Detailed Drainage Studies.** The developer will provide detailed drainage studies at the appropriate time.

Thank you for your comments. We trust that the issues raised in your letter have been addressed. Ed Iida of our office and I would be pleased to meet with you at your convenience to discuss the issues further.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

415 SOUTH KING STREET, ROOM 104  
HONOLULU, HAWAII 96813

November 9, 1987

MARVIN T. MIURA, Ph.D.  
DIRECTOR

TELEPHONE NO.  
548-9815

RECEIVED  
NOV 15 1987

RELI. COLLINS & ASSOCIATES

Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Department  
25 Aupuni Street  
Hilo, HI 96720

XIII-22

Mr. Albert Lono Lyman  
November 9, 1987  
Page 2

to protect the public health in the event of a malfunction in the waste treatment system, e.g. to detect any discharge of micro-organisms?

We look forward to hearing from you regarding these concerns.

Sincerely,

Marvin T. Miura, Ph.D.  
Interim Director

cc: Mr. William F. Mielcke  
Mauna Kea Properties, Inc.

Ms. Anne L. Mapes  
Belt Collins and Associates

Dear Mr. Lyman:

SUBJECT: Draft Environmental Impact Statement for the South Kohala Resort, Hawaii

In the draft of the South Kohala Resort Environmental Impact Statement, the applicant discusses many topics, but various problems are still left unresolved. For example:

1. The applicant recognizes that the "resident population will generate a demand for increased health care services." The applicant assumes that if the large hotels donate \$5 million to the Lucy Henriques Medical Center in Waimea, the facility will automatically build a hospital. On page 6.33 of the state's Health Services and Facility Plan of 1986, the number of beds projected for 1990 is 140 to 196. As the Big Island has exceeded that projection--it now has 260 beds--it is unlikely that the addition of more beds will be approved.
2. Please explain the phasing-in of the project and the cost and source of funds for each phase.
3. Please give a demographic analysis of the population in terms of the number of potential workers in each age group.
4. There is concern about the monitoring of the effluent wastewater that will be used to irrigate the golf course. What precautions will be taken

December 16, 1987  
87-2465

Dr. Marvin T. Miura, Interim Director  
Office of Environmental Quality Control  
State of Hawaii  
465 South King Street, Room 104  
Honolulu, Hawaii 96813

Dear Dr. Miura:

**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter to the Hawaii County Planning Department dated November 9, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to the issues raised are as follows:

1. **Health Services.** We wish to clarify that the applicant does not assume that the Lucy Henriques Medical Center in Waimea will automatically build a hospital as a result of the \$5 million donated by Westin Hotel & Resorts. It was stated in the Draft EIS that the purpose of the gift was to encourage long-range plans to upgrade the facility with a more complete range of medical services. Expanding the range of services at the Center (for example, installing new equipment, adding departments, upgrading work space, or enhancing staff capabilities) may or may not involve the addition of hospital beds.

Since the donation was made, the Lucy Henriques Medical Center has extended its emergency room hours of operation. The size of the physical plant has increased to allow workspace to be upgraded and enhanced. Unrestricted funds have also been used to improve maintenance.

2. **Project Phasing and Funding.** The project schedule and construction cost are explained on page II-37 of the Draft EIS (Section 3.4). Table II-12 on page II-38 shows how the various components of the project would be phased. The estimated construction cost of each component is given in Table II-13 on page II-39. Mainly private funds will be used to finance the project.

3. **Demographic Analysis.** It is difficult to provide a detailed age-specific demographic analysis of potential workers, although we would generally expect new workers to be fairly young (e.g., area high school graduates and/or younger in-migrants). The majority of the jobs for this project would not come on line for another five years. Our current estimate is that more than half the jobs created by the resort when it opens in 1993 would be filled by in-migrants--either at South Kohala Resort or filling vacancies created by other people moving to employment at the resort. The age characteristics of these in-migrants cannot be stated with precision at this time. However, it should be noted that the survey of Mauna Kea and Mauna Lani workers conducted for this EIS found that 50 percent of recent staff-level in-migrants were under 30 years of age, and 85 percent were under 40.

Dr. Marvin T. Miura  
December 16, 1987  
Page 2

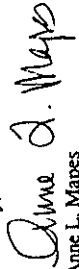
4. **Wastewater.** Sufficient precautions will be taken to minimize the probability of malfunction in the proposed resort's waste treatment system, including the installation of backup pumps and an emergency power generator. Plant operation procedures, such as the daily monitoring of effluent to detect any discharge of micro-organisms, will provide additional margins of safety against the release of pathogens at unacceptable levels into the environment. It should be noted that only a small amount of treated effluent will be available for irrigation, particularly during the early stages of development, and it will be mixed with brackish water to provide enough water to irrigate the golf course. Moreover, the likelihood of the effluent posing any hazards to residents will be extremely low due to the fact that it will be chlorinated at the wastewater treatment plant prior to being used for irrigation purposes.

It should be noted that the Hawaii County Planning Department has, in the past year, required developers to implement a water monitoring program as a condition of Special Management Area (SMA) permit approval. This condition constitutes a mitigation measure for water quality control.

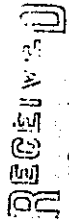
The applicant has considered the use of treated effluent for golf course irrigation to conserve water. It is hoped that given all the precautions outlined above, your department will support this conservation measure.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lynnan, Hawaii County Planning Department



NOV 10 1987

# University of Hawaii at Manoa

DEPT. OF PLANNING & ASSOCIATES

Environmental Center  
Crawford 317 • 2550 Campus Road  
Honolulu, Hawaii 96822  
Telephone (808) 948-7301

November 9, 1987  
RE:0476

Mr. Albert Lono Lyman, Director  
Planning Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

Draft Environmental Impact Statement  
South Kohala Resort  
South Kohala, Hawaii

The Environmental Center has conducted a review of the above referenced document with the assistance of Henry Gee, Y. S. Fok, and Edwin Murabayashi, Water Resources Research Center; Michael Graves, Anthropology; Hans-Jurgen Krock, Ocean Engineering; Jon Matsuoka, Sociology; and Jennifer Crummer, Environmental Center. The South Kohala Resort Plan includes: a 350-room luxury hotel, a tennis complex, an 18-hole golf course, a club house, and approximately 560 multifamily and single-family residential units. The total area of the South Kohala Resort is estimated at 489 acres.

### Social Impacts

The document generally describes the social impacts adequately, however, there is little attempt made to qualify these impacts. Facts are given to spell out the numerous problems that occur when one changes the social structure of an area, yet there is no attempt to suggest mitigating solutions for these impacts. As the South Kohala coast has been experiencing rapid and extensive growth, social impact should not be taken lightly, and mitigation measures should be included.

There are numerous statements in the EIS claiming the South Kohala Resort will be socio-economically advantageous to the Kohala community. Given that many employees will be imported, and Big Island residents most likely will have lesser stations, this may not be true. Economic advantages may be created, but these opportunities may not benefit everyone.

The methodology invoked in the section on Mental Health (V-72) is not clear.

AN EQUAL OPPORTUNITY EMPLOYER

Mr. Albert Lono Lyman

-2-

November 9, 1987

### Archaeology

There are a few means by which the document's archaeological report could be improved. There is no map of the project area which shows the location of the various sites, nor are location coordinates provided which might enable interested persons to reconstruct the locations of the sites. Very few sites have accompanying illustrations that show the precise configuration of the component features, and several that do are documented only with sketch maps (e.g., T-109). Given that no further work is anticipated in the project area, and that the report included in the EIS is the primary source for further information about sites which will eventually be destroyed, the archaeological report should include scaled drawings of the sites. This is required by standards established by the Society for Hawaiian Archaeology for surveys in areas where no further work will be undertaken. These drawings should become a part of the documentation for the final report. It is also suggested that these be incorporated into the Final EIS.

### Water Supply

Water supply demand (IX-2) for the proposed project is estimated by "resorts considered comparable". Demand projections should be estimated by number of rooms or some more specific means.

### Water Quality

The interpretation in Section 4.2.2 of the potential impacts of agricultural chemicals has serious logical flaws, as does the report by Green and Murdoch from which the section is derived. While it is true that annual precipitation is low, it is also true that soil cover is thin. If rain that does fall will readily infiltrate even at moderate levels, the volcanic series which are characterized by underlying lavas of the Ka'u Bull. 9, Hawaii Division of Hydrography, Territory of Hawaii, in cooperation with the U. S. Geological Survey) as "highly permeable". That significant amounts of applied agricultural chemicals are leached to the underlying groundwater is implicit in the continued fertilizer application schedule. The Law of Conservation of Matter and mass balance considerations dictate that the applied nitrogen either is accumulating in the soil/plant complex or is being removed from the system at a rate commensurate to that of its application. While it is common practice to remove cuttings from tees and greens, such is not the case on fairways which make up most of the golf course area. The soil column is not anaerobic, therefore there is no significant loss of nitrogen by denitrification. The only other mechanism for loss of nitrogen from the system is by leaching to the groundwater.

Conclusions based on analysis of shoreline water samples which are intended to reflect groundwater transport of agricultural chemicals must be considered very cautiously. As a consequence of the extreme variability of permeability of underlying lavas in the region, groundwater flow is distinctly anisotropic. Even if there were a uniform flux of groundwater approaching the shoreline, variation in the shoreline porosity and

Mr. Albert Lono Lyman

-3-

November 9, 1987

permeability would create a non-uniform discharge into the ocean. Dilution and mixing by waves and currents would quickly interfere with any distinct groundwater signal. As presented, the data in Table IV-8 do not clearly indicate that nitrogen from the Mauna Kea Resort has not enriched groundwater and subsequently shoreline waters." In fact, a more thorough analysis suggests the opposite conclusion. At the outset, data from station 3 show negligible influence of groundwater in nutrient levels and thus should be excluded from further consideration. For the remainder of the stations, it is useful to refer to the full data set as reported in the attachment to appendix D. Of all the reported nutrients, silica is most conservative as a trace indicator of groundwater influence. Since the level of dissolved silica in groundwater of West Hawaii averages 833  $\mu\text{moles l}^{-1}$  (Li, in press, Pacific Science), reported levels of silica can be used to determine groundwater dilution factors which, in turn, can be used to extrapolate measured nitrate + nitrite concentrations to estimate levels in the emergent groundwater. Results of this analysis for nitrate + nitrite (which, by the way, more accurately reflects potential subsidies of coastal nitrogen input due to application of inorganic agricultural chemicals than does TDN) are as follows:

|            | $\text{NO}_3 + \text{NO}_2$ ( $\mu\text{ moles l}^{-1}$ ) |
|------------|-----------------------------------------------------------|
| Station 1: | 61.9                                                      |
| Station 2: | 93.3                                                      |
| Station 3: | 68.5                                                      |

Background levels of nitrate + nitrite measured in groundwater from wells in the area average 60  $\mu\text{ moles l}^{-1}$  (Kanehiro, 1977; WRRC Tech. Rept. No. 110) which suggests that the groundwater emerging in the vicinity of the Mauna Kea Resort (Station 2) is substantially enriched in nitrogen.

It is important to note that very little significance may be attributed to samples collected in this manner on a single occasion. In view of known spatial and probable temporal variabilities in groundwater nutrient flux, a reliable data set to evaluate groundwater nutrient enrichment of coastal waters should integrate samples from many stations collected over at least a full annual climatic cycle. Furthermore, such coastal water samples should be augmented with groundwater samples from borings at intervals inshore of the coastline to derive more precise groundwater nutrient baselines. Conclusions drawn from a lesser data base may not be reliable.

#### Flood Zones

Page IV-4 states, "As shown on Fig. IV-1, most of the South Kohala Resort property is in Zone C, defined as an area of minimal flooding." Figure IV-1 on adjacent page IV-5, does not show any Zone C's.

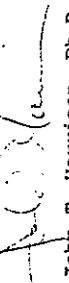
Mr. Albert Lono Lyman

-4-

November 9, 1987

We thank you for the opportunity to comment on this document. We look forward to your response to our comments.

Yours truly,

  
John T. Harrison, Ph.D.  
Environmental Coordinator

cc: OEOC

William F. Mielcke,  
Mauna Kea Preoperties, Inc.  
Anne L. Mapes,  
Belt, Collins & Associates  
L. Stephen Lau  
Henry Gee  
Y.S. Fok  
Edwin Murabayashi  
Michael Graves  
Hans-Jurgen Krock  
Jon Matsuoka  
Jennifer Crummer

December 16, 1987  
87-2464

Dr. John T. Harrison  
Environmental Center  
University of Hawaii  
Crawford 317  
2550 Campus Road  
Honolulu, Hawaii 96822

Dear Dr. Harrison:

South Kohala Resort Environmental Impact Statement (EIS)

We have received a copy of your letter to the Hawaii County Planning Department dated November 9, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your comments are as follows:

1. Social Impacts. We concur with your comments that social impacts should not be taken lightly and that mitigation measures should be included. Please note that out of 186 pages devoted to impact analysis in Chapters IV and V of the Draft EIS, 82 pages in Chapter V (including ten pages of mitigations) and an additional 5 pages in Chapter IV (including 2 pages of mitigations) are devoted to socio-economic and pure social impacts. Thus, nearly half of the total impact analysis concerns socio-economic impacts and mitigations.

We also concur with your comment that economic benefits may not accrue to everyone. For this reason, five pages in Chapter V, Section 1.2.8, were devoted to discussion of mitigation strategies to maximize employment and business opportunities for current residents.

The methodology underlying the section on Mental Health is contained in the references cited in that section. It consisted of a combination of analysis of secondary data on mental health caseload records and key informant interviews with mental health agency representatives.

2. Archaeology. As requested, a map of the project area that shows the location of the various archaeological sites will be incorporated into the Final EIS. Appendix G, "Archaeological Reconnaissance, Intensive Survey and Testing, Southernmost Portion, South Kohala Resort," will include a reduced version of PHRI's Site Location Map.

In response to your comment on accompanying illustrations, Dr. Rosendahl has informed us that the standard is not to include a map of every site in a report, especially when many similar sites and features are found. The standard practice is to provide maps and illustrations of sites and features that are unusual or unique, or which are considered good examples of a site or feature type. Complete documentation--including notes, maps, drawings, and photographs--is contained in the project field records retained by the archaeological consultant. These can be made available to qualified researchers upon request.

Dr. John T. Harrison  
December 16, 1987  
Page 2

We also wish to respond to your comment that "no further work is anticipated in the project area." The applicant intends to follow the recommendations made by Paul H. Rosendahl, Ph.D., Inc. (PHRI), including preservation of Site 5629 and relevant portions of Trail 9, with some level of interpretive development for both. As part of any interpretive development for Site 5629, further data recovery excavations have been recommended.

With regard to your comments concerning the standards established by the Society of Hawaiian Archaeology (SHA), we have discussed this issue with Dr. Rosendahl, and he has provided some clarification on the SHA standards. For your information, SHA is not an official regulatory or permitting agency, and its standards do not constitute any legal set of regulations or procedures. Rather, its standards have been used informally in recent years as guidelines (not fixed requirements) by several State and County agencies. The standards are meant to provide flexible guidelines which can be adapted to fit the specific needs of individual projects.

Finally, it should be noted that the PHRI report prepared for the Draft EIS was reviewed and approved by the State of Hawaii Department of Land and Natural Resources Historic Sites Section, which in its review letter of June 4, 1987, stated that "...descriptions of these sites are certainly sufficient for evaluating the significance of the sites, and again we find your inclusion of representative maps and photographs highly useful."

3. Water Supply. Please refer to pages V-117 to V-118 for an explanation of the methodology used to project water demand. Demand projections were estimated by number of units. Relying on records of actual water usage at comparable resorts, we calculated demand on a per-unit basis.

4. Water Quality. We wish to respond to the following statement in your letter: "That significant amounts of applied agricultural chemicals are leached to the underlying groundwater is implicit in the continued fertilizer application schedule." The interpretation of the word "significant" is most likely subjective. In Green and Murdoch's report, they stated that the low nitrogen levels at stations 2 and 3 "suggest that there is negligible movement of fertilizer nitrogen from where it is applied on the Mauna Kea Resort to groundwater and subsequently to shoreline waters." Comparison of these levels with nitrogen data for other sites (undeveloped) on the Kohala coast and elsewhere in Hawaii demonstrate that the nearshore waters of Kaunaoa Bay have not been enriched much, if at all, by fertilizer N. This is the bottom line of the assessment. The one-time sampling at Mauna Kea Resort provided useful information without excessive cost at this stage of the environmental study. No potential impacts were identified based on the sampling; however, over the next few months, we will continue to periodically sample and test water from the stations to verify our findings.

Green and Murdoch state that it would not be surprising to find some enrichment of groundwater with applied nitrogen. Please note that the groundwater body is not a source of potable water; rather, it is used for irrigation. Thus, whatever N enrichment does occur, it has no adverse effect if the N level of shoreline waters is not increased substantially. The calculations which led you to conclude that "the groundwater emerging in the vicinity of the Mauna Kea Resort (Station 2) is substantially enriched in nitrogen" are based on extrapolations derived from the average Si content of groundwaters of West Hawaii and average nitrate + nitrite content of groundwater from wells in the area. Such calculations are interesting but probably have little practical meaning in view of the low nitrogen concentrations actually measured at Kauna on Bay.

Dr. John T. Harrison  
December 16, 1987  
Page 3

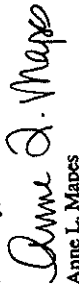
You may also note Chang and Young's conclusions in their study of golf course irrigation with treated sewage effluent (see page IV-29 in the DEIS). They found that almost all of the nutrient load is taken up by the soil-plant surface layer so that virtually none of it reaches the underlying material or groundwater.

The Hawaii County Planning Department has, in the past year, required developers to implement a water monitoring program as a condition of Special Management Area (SMA) permit approval. This condition constitutes a mitigation measure for water quality control.

5. Flood Zones. Figure IV-1 on page IV-4 will be revised in the Final EIS to show the Zone C areas.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

HAWAII FIRE DEPARTMENT • COUNTY OF HAWAII • HILO, HAWAII 96720

DE

SEP 20 1987

DATE <sup>REU</sup> September 26 1986

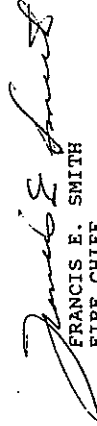
## Memorandum

TO : Albert Lono Lyman, Planning Director

FROM : Francis E. Smith, Fire Chief

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT -  
SOUTH KOHALA RESORT

We have no comments on the Environmental Impact Statement for South Kohala Resort which was prepared by Belt, Collins and Associates for Mauna Kea Properties, Inc.

  
FRANCIS E. SMITH  
FIRE CHIEF

FES/mc

cc: Mr. William F. Mielcke  
Mauna Kea Properties, Inc.

✓ Ms. Anne L. Mapes  
Belt, Collins & Associates



Daniel K. Carpenter  
Mayor  
RONALD J. RABARA  
Managing Director



DEPARTMENT OF PARKS & RECREATION  
COUNTY OF HAWAII

November 2, 1987

Mr. Albert Lyman, Director  
Planning Department  
County of Hawaii  
Hilo, HI 96720

Subject: South Kohala Resort - Environmental Impact Statement

Dear Mr. Lyman:

We have no adverse comments to offer on the EIS and support the proposed mitigation measure encouraging Mauna Kea Properties to work with the State of Hawaii toward the upgrading and expansion of Hapuna Beach State Recreation Area (page I-7).

Thank you for the opportunity to review the document.

Sincerely,

*Pat Engelhards*  
Patricia Engelhards  
Director

PE:GM:ai

cc: Mr. William Mielcke (Mauna Kea Properties, Inc.)  
Ms. Anne Mapes (Belt, Collins & Associates)

Patricia G. Engelhards  
Director

Ronald Okamura  
Deputy Director

RECEIVED  
NOV 3 1987

BEI, COLLINS & ASSOCIATES



COUNTY OF  
HAWAII

PLANNING DEPARTMENT

25 AUPUNI STREET • HILO, HAWAII 96720  
(808) 961-8286

DANTE E. CARPENTER  
Mayor  
ALBERT LONO LYMAN  
Director  
TIM LUI-KWAN  
Deputy Director

November 9, 1987

Ms. Anne L. Mapes  
Belt Collins & Associates  
606 Coral Street  
Honolulu, HI 96813

Dear Ms. Mapes:

Comments - South Kohala Resort Draft EIS

We have reviewed the subject draft EIS and provide you with the following comments:

1) Page II-8, Figure II-5 (Hotel Parcel Concept Plan): A legend should be provided to denote symbols/markings.

2) Recreation:

The text does not discuss any on-site mauka-makai public shoreline access and parking areas. What are the provisions for these?

Maps showing existing recreational facilities at Hapuna Beach State Recreation Area and Mauna Kea Properties in relation to the proposed hotel site should be provided.

3) The traffic analysis is sufficient at this time, which presents a direct and cumulative impact analysis focusing in on the proposed resorts. However, it should be noted that there will be substantial increases in traffic owing to the secondary and tertiary growth generated by the resort development. As such, the traffic analysis should also be included as unresolved issues.

4) Photographs in the Appendix is poorly reproduced.

5) Murdoch and Green Reports:  
Page C-6: Recommendations were not followed in the next report on page D-1. Water from the lower irrigation well was not analyzed.

**BELT COLLINS  
& ASSOCIATES**

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 74307-1 • Fax (808) 521-5362

Hawaii • Singapore • Australia • Hong Kong

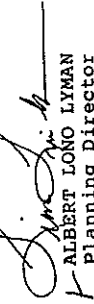
December 16, 1987  
87-2466

Page D-2: Station #1 is shown north of Mauna Kea Beach Hotel but the text says that it is supposed to be at Puako.

Page D-3: Conclusion is based on only 1 day's observation?

Should you have any questions on our comments, please feel free to contact our office.

Sincerely,

  
ALBERT LONO LYMAN  
Planning Director

62-111X

RN/AK

Mr. Albert Lono Lyman, Director  
Planning Department  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Lyman:

**South Kohala Resort Environmental Impact Statement (EIS)**

Thank you for your letter of November 9, 1987, regarding the Draft EIS for the proposed South Kohala Resort. Our responses to your comments are as follows:

1. **Illustrations.** The Hotel Parcel Concept Plan (Figure II-5) shown on page II-8 of the Draft EIS will contain expanded labeling in the Final EIS. We will add a map showing the landscape concept plan for the hotel site, with a legend for the vegetation. In addition, we will include in the Final EIS a map showing existing recreational facilities at Hapuna Beach State Recreation Area in relation to the proposed resort site. When the Final EIS is printed, care will be taken in reproducing the photos in the Appendix.
2. **Public Access.** In accordance with the approved SMA permit, public parking and a public right-of-way to the shoreline will be shown on the site plan in the Final EIS as located adjacent to the resort's boundary with Hapuna Beach State Recreation Area. There are alternatives to this solution, including the provision of additional parking by the applicant at the north end of the State park.
3. **Traffic.** We agree with your opinion that traffic generated by secondary and tertiary population growth is an unresolved issue, and this will be stated in the Final EIS.
4. **Murdoch/Green Report.** Green and Murdoch did recommend that water from the lower irrigation well be analyzed. However, only samples from the shoreline area were taken before the Draft EIS was completed. The applicant intends to periodically sample and test water as described below. One cannot conclude much from a few sites sampled once or twice unless the concentrations measured are much higher than the ambient background for the area. If the previous samples of shoreline water had clearly shown enrichment with fertilizer N, then Green and Murdoch would have pursued the analysis for a mobile herbicide (Metribuzin), but this was not the case.

The limitations of a single observation at each site are acknowledged above. The single sampling gave results which did not, in Green and Murdoch's judgement, warrant further sampling at this stage of the environmental study. No potential impacts were identified based on the sampling; however, over the next few months, we will continue to periodically sample and test water at the stations, including the lower irrigation well, to verify the findings.

Mr. Albert Lono Lyman  
December 16, 1987  
Page 2

We note that your department has, in the past year, required developers to implement a water monitoring program as a condition of Special Management Area (SMA) permit approval. This condition constitutes a mitigation measure for water quality control.

With reference to page D-2 in the Appendix of the Draft EIS, there is an error on Table 1 and in the text. Station #1 was located north of the Westin Mauna Kea, as shown on the map.

We trust that the issues raised in your letter have been adequately addressed. Thank you for your cooperation.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke



POLICE DEPARTMENT

COUNTY OF HAWAII  
348 KAPOLANI STREET  
HILO, HAWAII 96720

OUR REFERENCE  
YOUR REFERENCE

OCT 16 1987

HAWAII

BEIT, COLLINS & ASSOCIATES

GUY A. PAUL  
CHIEF OF POLICE  
WAYNE G. CARL  
DEPUTY CHIEF

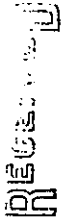
October 6, 1987

TO : PLANNING DEPARTMENT  
FROM : GUY A. PAUL, CHIEF OF POLICE  
SUBJECT: SOUTH KOHALA RESORT APPLICATION

We have had an opportunity to review the Environmental Impact Statement for the South Kohala Resort and from the police standpoint, we foresee no adverse effect from the requested land use.

*Guy A. Paul*  
GUY A. PAUL  
CHIEF OF POLICE

cc: S. Kohala Police



NOV 18 1987

DEPARTMENT OF PUBLIC WORKS  
COUNTY OF HAWAII  
HILO, HAWAII

BELT COLLINS & ASSOCIATES

DATE November 6, 1987

BELT COLLINS  
& ASSOCIATES

Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 7130474 • Fax (808) 521-5362  
Hawaii • Singapore • Australia • Hong Kong

December 16, 1987  
87-2467

*Memorandum*

TO : Planning Department

FROM : Chief Engineer

SUBJECT: SOUTH KOHALA RESORT EIS  
TRM: 6-2-2:12 & 13; 6-6-2:37 & 38

XIII-31

We have reviewed the subject document and we have the following comments:

1. Disposal of construction wastes should be accounted for as a cost item and appropriately budgeted.
2. EIS should address the matter of on-site sludge disposal.
3. The Queen Kaahumanu Highway is an arterial system whose efficiency depends upon high speeds over long distances. The developments along the coast should be interconnected whenever possible to allow vehicular traffic between resorts in order to reduce the traffic volume of the Queen Kaahumanu Highway. This is especially true for contiguous resorts even though they may be operated separately.

*Hugh Y. Ono*  
HUGH Y. ONO, P.E.  
Chief Engineer  
DHW:ga

cc: Waste Management  
Traffic Division

Mr. Hugh Y. Ono, P.E.  
Chief Engineer  
Department of Public Works  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Ono:

South Kohala Resort Environmental Impact Statement (EIS)

We have received a copy of your memo to the Hawaii County Planning Department dated November 6, 1987, commenting on the South Kohala Resort Draft EIS. Our responses to your comments are as follows:

1. **Construction Wastes.** The cost of disposal of construction wastes is already included in the construction cost estimates shown in Table II-13, page II-39, of the Draft EIS. The applicant will work with the County on the means and methods of disposal acceptable to the County.
2. **Sludge Disposal.** The resort nursery will be using the sewage sludge as fertilizer on the site. Sludge at Mauna Kea Resort is dried in drying beds and then stored for future use; the process will be the same at South Kohala Resort. According to Ray Seaver, Director of Engineering at the Westin Mauna Kea, about two cubic yards of sludge is produced annually at the wastewater treatment plant.
3. **Road Connecting the Two Resorts.** We understand your concern about increased traffic on the Queen Kaahumanu Highway. To reduce the traffic impact of the proposed development, our plans include an underpass beneath the highway to permit automobile, golf car, and pedestrian movement between the mauka and makai lands of the resort. (All work in the public right-of-way is part of the project as described in the EIS.) However, we did not plan for an interconnecting road between the proposed South Kohala Resort and existing Mauna Kea Resort for the following reasons. There will be very little vehicular traffic between the two self-contained destination resorts since each will have its own comprehensive on-site amenities, including golf, tennis, and restaurant facilities. An interconnecting road will not be required from an operational standpoint either, since each resort will be operated autonomously.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielecke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

COPY

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII

25 AUPUNI STREET • HILO, HAWAII 96720

DEC 7 1987



December 4, 1987

October 9, 1987

SELF, COLLINS & ASSOCIATES

|              |  |
|--------------|--|
| Mr. Tolson   |  |
| Mr. Felt     |  |
| Mr. Rosen    |  |
| Mr. Sullivan |  |
| Mr. Tavel    |  |
| Mr. Trotter  |  |
| Tele. Room   |  |
| Miss Holmes  |  |
| Miss Gandy   |  |

White, A  
Cline, R  
Koronen  
Koyama  
Kupari  
Meyer, A  
Schwartz  
Kanehiko  
Uyechi, X  
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File Job #

Belt, Collins & Associates  
606 Coral Street  
Honolulu, Hawaii 96813

Attention: Ms. Anne L. Mapes  
Dear Ms. Mapes:

Subject: Environmental Impact Statement Preparation Notice  
South Kohala Resort, South Kohala, Hawaii

This is to confirm our telephone conversation regarding the electrical requirements:

1. Correct HELCO's system capacity from 26MW to 126MW in the first paragraph of Section 5.8.1, page V-122.
2. Revise the Peak Demand KW/unit list on Table V-34, page V-124 as follows:

|               |        |     |
|---------------|--------|-----|
| Hotel         | 2 to 3 | (1) |
| Multifamily   | 2 to 4 | (1) |
| Single Family | 3 to 6 | (1) |
| Single Family | 3      | (2) |

- (1) Air conditioning loads included.
- (2) Secondary growth.

Please call me at 969-0323, if you have any questions.

Very truly yours,

*Melvin S. Yamaki*

Melvin S. Yamaki  
Electrical Engineer  
Planning Division

MSY:ls

cc: C. Nagata  
H. Bradley

TO: Mr. Albert Louis Lyman, Planning Director  
FROM: H. William Sewake, Manager  
SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
SEPTEMBER 1987  
SOUTH KOHALA RESORT

We have no additional comments to the subject document at this time. However, the developer is requested to submit a water system development master plan for review and approval at the appropriate time.

*H. William Sewake*  
H. William Sewake  
Manager

OA

cc - Mr. William F. Mielcke  
Ms. Anne L. Mapes

944. 1.

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NOV 30 1967

RESPONSE TO THE E. I. S. FOR

SOUTH KOHALA RESORT

RELI. COLLINS & ASSOCIATES

TO: LONO LYMAN, DIRECTOR  
COUNTY OF HAWAII PLANNING DEPARTMENT  
25 AUPUNI STREET  
HILO, HAWAII 96720

FROM: TOM BEACH, CITIZEN  
WAIHEA, HAWAII

INTRODUCTION:

THE PROJECT AT SOUTH KOHALA RESORT ( SKR ) IS ONE OF MANY THAT ARE PLANNED OR ALREADY DEVELOPING ALONG THE WEST HAWAII COASTLINE. IT IS ALSO LUXURIOUS LIKE THE REST HOWEVER. ITS PROPOSED HOTEL SITE SETS IT APART FROM OTHER SIMILAR PROMINENT PROJECTS OF THAT CALIBER.

THE SKR IS FOLLOWING THE SAME GENERAL PLAN AS WAS DONE AT MAUNA KEA BEACH HOTEL. AT THAT SITE THERE IS ALSO A WHITE SAND BEACH OF SIMILAR BEAUTY. THE MKBH WAS BUILT AT THE NORTH END OF KAUNAOA BEACH. THIS FORMULA PROVED TO BE VERY SUCCESSFUL OVER THE YEARS. INDEED, MANY HOTELS STATEWIDE USE THIS FORMULA PROFITABLY. ECONOMIC RETURN TO THE DEVELOPER IS NOT AT QUESTION CONCERNING THE USE OF BEACHES AS HOTEL FOCAL POINTS.

I WISH TO POINT OUT THAT THE INVENTORY OF BEACHES IN HAWAII STATE AND VERY ESPECIALLY HAWAII ISLAND IS LIMITED AND STATIC. THE INVENTORY OF UNDEVELOPED BEACHES IS RAPIDLY APPROACHING ZERO. THE NUMBER OF BEACHES THAT HAVE BEEN DESIGNATED TO REMAIN UNDEVELOPED AND LEFT NATURAL IS VIRTUALLY ZERO.

BY THE YEAR 2000 HAWAII WILL HAVE A TOTALLY HOTELLED BEACH INVENTORY. PRACTICALLY EVERY WHITE SAND BEACH IN THE STATE IS BEING SOLD AS A HOTEL SITE.

FROM THE STANDPOINT OF MONETARY RETURN, THIS SITUATION WILL PROVE TO BE VERY REVENUE GENERATING. TO A POINT, THE PUBLIC, OUR PEOPLE, WILL HAVE FEW, IF ANY, NATURAL BEACHES TO GO TO FOR A NATURAL RECREATIONAL EXPERIENCE. EVERY BEACH WILL BE ALTERED.

ACCESS MAY BE ASSURED TO THOSE BEACHES, BUT WHAT OF THE QUALITY OF RECREATIONAL EXPERIENCE IT WILL NOT BE A QUESTION OF GETTING IN THE CAR AND DRIVING TO A MORE DISTANT LOCATION TO FIND A BEACH TO GET AWAY FROM THE ARTIFICIALITY OF ENVIRONMENT CREATED BY MAN. THERE WILL BE NO OTHER PLACE LEFT TO GO TO THAT IS NATURAL AND UNTOUCHED.

THAT SCENARIO IS NOT IMPOSSIBLE. IT IS PROBABLE AND HAPPENING RIGHT NOW. WHAT HASN'T HAPPENED YET IS PLANNED. YOU SEE IT IN YOUR OFFICE EVERY DAY. OUR CHILDREN AND THEIR CHILDREN MAY NEVER KNOW A NATURAL BEACH ENVIRONMENT AS HAVE WE. IS THAT A WISE COURSE TO FOLLOW?

REASON AND GOOD JUDGEMENT DICTATE THAT PLANNING MUST INCLUDE CONSIDERATION OF MORE THAN CALCULATIONS OF INCREASED ECONOMIC RETURN. OUR PEOPLE NEED MORE THAN BREAD AND A PLACE TO SLEEP. OUR PEOPLE, YOU AND I, WE ALL NEED RESPIRE FROM THE SIGHTS AND SOUNDS OF TOIL. WE ALL NEED TO ESCAPE TO OUR TRUE SELVES AND BASIC RELATIONSHIPS TO WHICH NATURE IS OUR KEY. WE NEED TO EXPERIENCE NATURE FIRST HAND, PURE, PRISTINE, AND UNDILUTED. NATURE HOLDS ANSWERS TO QUESTIONS WE DO NOT YET KNOW HOW TO ASK.

HAPUNA BEACH CONFERS UPON THOSE WHO VISIT IT A BENEFICIAL EXPERIENCE. THAT EXPERIENCE HEALS THE WOUNDS THAT STRESS AND TOIL INFLICT. THE SIGHTS AND SOUNDS OF A LARGE COMMERCIAL ENTERPRISE A HAPUNA WILL HAVE THE EFFECT OF DESTROYING THE RECREATIONAL VALUE FOR WHICH HAPUNA STATE BEACH WAS DEDICATED AND ORIGINALLY GIVEN.

GOOD IS NOT MEASURED IN DOLLARS. NOR IS IT MEASURED MERELY IN DEGREES OF PLEASURE ATTAINED. GOOD IS A MEASURE OF FITNESS AND SUITABILITY. THE DESTRUCTION OF THE NORTH END OF HAPUNA BEACH BY THE INCLUSION OF A LARGE AND DOMINATING HOTEL COMPLEX IS NOT COMPATIBLE WITH THE RECREATIONAL NATURE ENCOMPASSED FOR HAPUNA. IT IS UNSUITABLE. IT DOES NOT FIT OR CONFORM TO THE STATE, COUNTY, AND PUBLICS' RECREATIONAL OBJECTIVES. IT IS IN DIRECT CONFLICT WITH THOSE OBJECTIVES AND IDEALS. NAMELY, REFRESHMENT OF THE STRENGTH AND SPIRIT OF THE PEOPLE AFTER THEIR TOIL. IT WILL NOT AID IN RESTORING THEIR MENTAL HEALTH AS DESIRED IF DEVELOPED.

THE DEVELOPMENT OF THE HOTEL SITE AS PROPOSED IS BEYOND SOUND REASONING AND GOOD JUDGEMENT. THE COMPLEX AGGREGATE OF THE NATURAL SETTING WILL BE IRREVERSIBLY AND NEGATIVELY LESSENERD. IT WILL BE AN INSULT TO THE PUBLICS' HIGHER CONSCIOUSNESS.

THUS, OUR PEOPLE NEED THE ECONOMIC BENEFITS OF APPROPRIATE DEVELOPMENT. WE NEED ESCAPE FROM COMMERCE AS WELL. WE RESIDENTS DO NOT HAVE THE FINANCIAL MEANS TO ESCAPE TO FAR AWAY OASIS OF UNTOUCHED NATURAL BEACH SETTINGS SUCH AS ONCS EXISTED HERE. WE MUST THEREFORE DEPEND ON OUR REPRESENTATIVES IN GOVERNMENT TO PRESERVE AT LEAST A FEW SUCH SACRATIVES HERE.

HAWAII IS OUR HOME. WE LIVE HERE. IT IS OUR RESPONSIBILITY TO PROTECT AND NURTURE THIS LAND THAT IT MAY IN RETURN NURTURE AND RESTORE US. IF WE FAIL TO CARE FOR THIS LAND, OUR PEOPLE WILL SUFFER. OUR BROTHERS AND SISTERS, CHILDREN AND GRANDCHILDREN DEPEND ON YOUR WISDOM. DO NOT PERMIT HAPUNA TO BE SPOILED.

THE ECONOMIC BENEFITS THAT ACCRUE CAN NEVER REPLACE WHAT THE BUILDDOZER BLADES DESTROY. THE DIRECT, INDIRECT, AND INDUCED CONSEQUENCES OF A RUINED NATURAL ENVIRONMENT ARE SUBTLE AND YET FAR REACHING.

THERE ARE NO GRAPHS AND STATISTICS TO PROVE THE CONSEQUENCES OF REMOVING THE NATURAL BEAUTY AND RECREATIONAL EXPERIENCE FROM THE PUBLICS' PSYCHE. WE ARE GIVEN TO CONNECT THOSE TWO BY REASON AND OBSERVATION. WHEN HUMANS ARE REMOVED FROM INTERACTION WITH NATURE, THEY SLOWLY GO INSANE. OBSERVE OUR INNER CITIES, OUR PRISONS, OUR SAILORS RETURNING TO SHORE. THESE GROUPS LOSE AN ESSENTIAL PART OF THEIR HUMANITY IF FORCED TO LIVE OUTSIDE OF NATURE.

YOU ARE A PLANNER. YOU SHAPE THE FUTURE OF THIS COMMUNITY. YOU DEAL WITH THE MOVERS AND SHAKERS WHO PROPOSE DEVELOPMENTS. LIKE CHILDREN, THESE PEOPLE MUST BE DENIED SOME THINGS THAT THEY ASK FOR THE GOOD OF ALL. LIKE CANDY, THE PURSUIT OF MONEY CAN LEAD TO ILLNESS. IT IS INCUMBENT UPON YOU TO DEMONSTRATE WISDOM ABOVE THEIR AVARICE.

EVERY DECISION TO SACRIFICE NATURE ON THE ALTER OF MAMMON CAUSES A RESPONSE IN SOCIETY. ONE NEED ONLY LOOK AT AREAS THAT HAVE DONE THIS TO SEE THAT NONE PROFIT BY IT. THE RICH CAN AND WILL MOVE ONE STEP FROM THE ENSUING UGLINESS. BUT I ASK YOU, LONO, WHERE WILL WE MOVE VERY DIFFICULT OR IMPOSSIBLE TO RESOLVE. IT IS BETTER TO PREVENT SUCH SUFFERING.

EVERY DECISION TO SACRIFICE NATURE ON THE ALTER OF MAMMON CAUSES A RESPONSE IN SOCIETY. ONE NEED ONLY LOOK AT AREAS THAT HAVE DONE THIS TO SEE THAT NONE PROFIT BY IT. THE RICH CAN AND WILL MOVE ONE STEP FROM THE ENSUING UGLINESS. BUT I ASK YOU, LONO, WHERE WILL WE MOVE VERY DIFFICULT OR IMPOSSIBLE TO RESOLVE. IT IS BETTER TO PREVENT SUCH SUFFERING.

*Tom Beach*

SUMMARY OF IMPACTS

I PHYSICAL ENVIRONMENT

THE PROJECT SITE COULD BE USED PROBABLY TO PRODUCE AGRICULTURAL PRODUCTS. EVIDENCE OF THIS FACT IS THE OBVIOUS DIVERSITY AND PROFUSION OF VEGETATION AT ALL THE NEARBY RESORTS.

THE SITE WILL REQUIRE MAJOR GRADING AND LANDSCAPING TO ACCOMPLISH THE GOALS OUTLINED IN THE EIS. BUDGET ESTIMATES FOR THESE TWO ITEMS SHOULD TELL THE STORY.

VIEW PLANES WILL BE COMPROMISED. VIEWS WILL BE BLOCKED AND REPLACED.

DRAINAGE FROM THE SITE WILL BE INCREASED DUE TO INCREASED COVERING BY NON POROUS MATERIALS. INCREASED DRAINAGE WILL ADVERSELY AFFECT THE BEACH AND BAY OF HAPUNA.

II NEARSHORE AND MARINE ENVIRONMENT

THE 10 FOOT SET BACK AREA WILL BE ALTERED SIGNIFICANTLY AND GIVEN A FEELING OF BEING CONTROLLED RATHER THAN A FREE AND NATURAL STATE. THE VEGETATIVE BUFFER GROWTH ZONE BETWEEN THE HOTEL AND BEACH WILL BE REDUCED IN DENSITY AND DEPTH. THIS IS AN ANTICIPATED ADVERSE IMPACT.

MARINE WATER SURVEYS INDICATED THAT THERE ARE MAJOR INCREASES IN NITRATES AND NITRITES COMING FROM THE SHORE NOW. CHLOROPHYLL LEVELS ARE RAPIDLY INCREASING ALSO. NITRATES AND NITRITES AND NITROGEN COMPOUNDS ARE THE BASIS OF GOLF COURSE FERTILIZERS. I STRONGLY SUSPECT THAT THE GROUNDWATER IS BEING POLLUTED WITH THESE HIGHLY SOLUBLE SUBSTANCES. NO MANDATED MANAGEMENT PRACTICES FOR AG CHEMICALS IS SPECIFIED.

DUST WILL BE GENERATED IN HUGE AMOUNTS. THIS DUST WILL SETTLE ON THE BEACH AND IN THE BAY. WATER CLARITY WILL BE EFFECTED ADVERSELY. BEACH USERS AND MARINE ORGANISMS WILL BE ADVERSELY EFFECTED. NO MANDATED MITIGATING PRACTICE IS SPECIFIED.

RAINFALL IS RARE. ON OCCASION THERE ARE DOWNPOURS WHICH CAUSE HEAVY SEDIMENTATION TO OCCUR IN THE BAY. THERE IS NO MANDATED CATCHMENT OF CONSTRUCTION ZONE RUNOFF.

MANDATED AND SPECIFIC MITIGATION MEASURES.

III FLORA AND FAUNA

THE PRESENT VEGETATION IS PLANNED TO BE REMOVED IN MAJOR PART AND REPLACED BY LANDSCAPING MATERIALS. THE NATURAL CHARACTER OF THE SETTING SURROUNDING THE NORTH END OF HAPUNA BEACH WILL BECOME ONE OF ARTIFICIAL AND CONTRIVED ENVIRONMENT. THIS IS NOT ACCEPTABLE AS A RECREATIONAL VIEW PLANE ALTERATION.

NEITHER ARE A MASS OF BUILDINGS THAT ARE TO REPLACE THE VEGETATION.

FAUNA WILL ALSO UNDERGO A REPLACEMENT IN NUMBERS AND TYPES. THE SHIFT WILL BE TO MORE HUMAN DEPENDENT SPECIES. WATER.

THIS REPLACEMENT OF FLORA AND FAUNA IS UNACCEPTABLE.

IV SOCIO-ECONOMIC CONSIDERATIONS

THERE WILL BE MAJOR INFRASTRUCTURE EXPENDITURES BY THE GOVERNMENT TO SATISFY THE NEEDS CAUSED BY THIS DEVELOPMENT. TAXES MUST AND WILL BE RAISED TO PAY EXPENSES. BONDED INTERESTS WILL INCREASE. USER FEES WILL INCREASE.

STRESS OF CHANGES CAUSED BY THIS DEVELOPMENT WILL BRING ABOUT UNWANTED SOCIAL HOSTILITY AND DISHARMONY. THERE ARE THOUSANDS OF VOTERS WHO DO NOT WANT THIS DEVELOPMENT TO HAPPEN.

THERE WILL MAJOR ECONOMIC CONSEQUENCES FROM THIS STRESS INDUCED DISHARMONY. THERE WILL BE MAJOR INCREASES IN CRIME. VIOLENT CRIME WILL INCREASE. THERE WILL BE MORE SICKNESS. THERE WILL MORE MENTALLY ILL PERSONS. SEE: FUTURE SHOCK BY TOPFLER.

THE FULL COST OF ALL ENSUING NEEDS CAUSED BY THIS PROJECT WERE NOT ACCURATELY DEPICTED IN THE PUBLIC REVENUE COST ANALYSIS ESTIMATES IN THE EIS. NOTABLY ABSENT ARE THE COSTS ASSOCIATED WITH HARBOR EXPANSION, AIRPORT EXPANSION, HIGHWAY BUILDING AND MAINTENANCE, UTILITIES EXPANSION SCHOOL BUILDING CONSTRUCTION, WASTE DISPOSAL SITE CONSTRUCTION, EMPLOYEE HOUSING COSTS, EMPLOYEE TRANSPORTATION COSTS, WATER RESOURCE DEPLETION AND DEVELOPMENT COSTS, RECREATIONAL RESOURCE DEPLETION, PUBLIC SERVICES EXPANSION, COST OF LIVING INCREASES (COSTS) DUE TO GREATER DEMAND AND AFFLUENT CONSUMER IN-MIGRATION. THESE COSTS SHOULD BE FACTORED IN EVEN IF THEY ARE NOT TAX BASED. THESE ARE INDEED COSTS TO CITIZENS VIA BONDS, USER FEE INCREASES, AND COSTS OF LIVING.

ALSO WHAT PORTION OF REVENUES GO TO OUT OF COUNTY GOVERNMENT SECURITY AND NEVER RETURN?

ALSO: ARE THE REVENUES CONSIDERED AS GROSS BEFORE EXPENSES DEDUCTIONS ARE CLAIMED?

ALSO: IS THE REVENUE BASED ON 100% OCCUPANCY OR AT WHAT PERCENTAGE IT IS NOT ENTIRELY TRUE THAT USER FEES PAY FOR THOSE ITEMS MENTIONED THERE ARE FEDERAL AND STATE CONTRIBUTIONS FOR SOME OF THOSE ITEMS.

V TRANSPORTATION

WEST HAWAII ROADS WILL REQUIRE MORE FREQUENT MAINTENANCE BECAUSE THEY WILL BE USED FAR MORE. OUR ROADS WILL EXPERIENCE MUCH HEAVIER AND SLOWER TRAFFIC. TRANSIT TIMES WILL BE LENGTHENED. NOISE AND AIR POLLUTION WILL INCREASE SIGNIFICANTLY IN THE PROJECT AREA AND OUTSIDE IT.

AIRPORT AND HARBOR FACILITIES ARE ALREADY STRAINED TO CAPACITY AND BEYOND. MAJOR EXPENDITURES TO CORRECT THIS SITUATION MUST BE MADE. PUBLIC INTERESTS WILL INCREASE AND CARRY FAR INTO THE FUTURE.

(3)

PRIVATE AND PUBLIC MASS TRANSIT FACILITIES MUST BE EXPANDED TO MEET DEMAND. BUSES AND/OR A RAIL SYSTEM WILL BE NEEDED IMMEDIATELY.

VI AIR QUALITY AND NOISE

DUST, EXHAUST, AND NOISE WILL SIGNIFICANTLY DIMINISH THE RECREATIONAL EXPERIENCE AT HAPUNA BEACH. CONSTRUCTION WILL REQUIRE GRADING, BLASTING, MOTORIZED EQUIPMENT USE, JACK HAMMERING, AND VARIOUS ACTIVITIES THAT COMPLETELY INCOMPATIBLE WITH RECREATIONAL ACTIVITIES AT A BEACH OR NEAR IT.

HOTEL MAINTENANCE EQUIPMENT WILL BE AN ONGOING PERSISTENT ANNOYANCE DUE TO NOISE AND ODOR OF CHEMICALS/EXHAUST. THIS IS INCOMPATIBLE WITH RECREATIONAL OBJECTIVES.

HELICOPTER FACILITIES AND ACTIVITY IS NOW A MAJOR NOISE GENERATOR AT KAUNAOA BEACH NEXT DOOR. THEREFORE, ANY HELICOPTER FACILITY OR ACTIVITY MUST BE SPECIFICALLY PROHIBITED IN PERPETUITY AS A PREREQUISITE OF PERMIT APPROVAL.

CARBON MONOXIDE LEVELS WILL RISE TO LEVELS THAT MAY BE ACCEPTABLE IN A CITY BUT ABOVE WHAT IS DESIRABLE AT A PUBLIC RECREATIONAL FACILITY. THIS DEVELOPMENT IS A DIRECT CAUSE OF THE INCREASE IN CARBON MONOXIDE LEVELS. IT SHOULD NOT BE APPROVED AS DESIGNED.

THE EIS NOT MENTION ODOR GENERATION CAUSED BY THE HWTELL AND RESORT. THE SMELL OF FOOD COOKING, EXHAUSTS PESTICIDES, AND SMOKE HAVE A VERY ADVERSE EFFECT ON THE BEACH PUBLICS EXPERIENCE OF NATURE AND THE NATURAL SETTING.

PROPOSED MITIGATION MEASURES.

ANY AND ALL MITIGATING MEASURES SUGGESTED IN THE EIS MUST BE CONSIDERED AS ONLY POSSIBILITIES UNTIL AND UNLESS THEY ARE SPECIFICALLY MONITORED BY AN INDEPENDENT PUBLIC AGENCY ON A REGULAR AND FREQUENT BASIS AND SPECIFICALLY MANDATED BY THE PLANNING DEPT. AND PUNITIVE DAMAGES ACCESSED FOR VIOLATIONS. THESE MANDATES MUST BE SIGNED BY MANAGEMENT TO INSURE THAT MANAGEMENT PEROGATIVE IS NOT THE SOLE DIRECTIVE FOR THEIR IMPLEMENTATION.

SUMMARY OF ALTERNATIVES

THE RESORT WITHOUT SHORELINE IMPROVEMENTS WOULD BENEFIT THE BEACH USERS RECREATIONAL EXPERIENCE.

SHORELINE SETBACK VARIANCE SHOULD NOT BE GRANTED AND THE HOTEL PARCEL SHOULD BE CONDEMNED BY THE STATE.

THE PROJECT SHOULD BE ALLOWED TO CONTINUE BUT NOT AS PLANNED.

THE HOTEL SITE SHOULD BE BOUGHT BY THE STATE AND INCLUDED IN THE STATE BEACH PARK. THE COST OF THE PARCEL SHOULD BE PAID OUT OF STATE PARKS USER FEES INTO A BOND ISSUED FOR THE PURPOSE.

THE STATE SHOULD USE THE HOTEL SITE AS A RETREAT FOR STRESSED HOTEL INDUSTRY EXECUTIVES. (JUST JOKING)

(4)

THE STATE COULD ESTABLISH A YOUTH HOSTEL ON THE SITE.

PLACE THE HOTEL SITE AT THE BLUFFS AREA BETWEEN KAUNAOA AND HAPUNA BAYS.

enr



**BELT COLLINS  
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December 16, 1987  
87-2468

Mr. Tom Beach  
P.O. Box 69  
Kamuela, Hawaii 96743

Dear Mr. Beach:

**South Kohala Resort Environmental Impact Statement (EIS)**

The Hawaii County Planning Department forwarded us a copy of your letter commenting on the Draft EIS for the proposed South Kohala Resort. They have advised us that your letter was not received or postmarked by the November 9th deadline. Nevertheless, we are responding to your comments that relate to the environmental issues raised in the Draft EIS; policy issues, we presume, are addressed to the Planning Department in your letter.

1. **Physical Environment.** Your suggestion that "the project site could be used profitably to produce agricultural products" is unrealistic due to the poor soil and extremely low rainfall. Please refer to pages IV-2 to 4 in the Draft EIS.

Your assumption that major grading will be required is not correct. As stated in the EIS, "minor changes in surface contours will be made to improve drainage, provide adequate building sites, set road alignments, and establish desirable golf fairway topography" (page IV-3).

Visual impacts have been disclosed and mitigation measures suggested. In addition, illustrations showing views of the hotel from various perspectives on the beach will be presented in the Final EIS.

Contrary to your statement, drainage impacts will not be adverse. The resort's drainage system will be designed to retain stormwater and sediment, thus minimizing any impact on the nearshore environment.

2. **Nearshore and Marine Environment.** The 40-foot setback area will be altered but not significantly. A description of the planned improvements can be found on page II-12.

As much as possible, existing vegetation will be retained, and a landscape concept plan for the proposed hotel complex will be included in the Final EIS. Your statement that reduction of vegetation between the proposed hotel and the beach would be adverse is not supported by the findings of the botanical survey conducted as part of the EIS (see pages IV-30 to 31).

In your letter, you state the following: "Marine water surveys indicated that there are major increases in nitrates and nitrites coming from the shore now. Chlorophyll levels are rapidly increasing also." If you are referring to the marine surveys carried out as part of the EIS, we ask that you reread pages IV-11 through 17, as well as pages IV-25 through 28.

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Since the study conducted by Green and Murdoch indicates that effects of agricultural chemicals on Kaunaloa Bay have been negligible, it appears that the management practices followed by Mauna Kea Resort are adequate. The need for "mandated management practices for ag chemicals" is questionable. However, over the next few months, we will continue to sample and test water from the stations to verify Green and Murdoch's findings that there are no potential impacts.

It should be noted that the Hawaii County Planning Department has, in the past year, required developers to implement a water monitoring program as a condition of Special Management Area (SMA) permit approval. This condition constitutes a mitigation measure for water quality control.

Your conclusion that "dust will be generated in huge amounts" assumes that no measures will be followed to control fugitive dust. Please reread page V-101 in the Draft EIS. With proper control measures, impacts on neighboring resort and recreation facilities, as well as the nearshore environment, will not be adverse. (See also page IV-21 to 22 regarding sedimentation in the bay.) For your information, management practices to reduce fugitive dust emission are mandated by State of Hawaii regulations and are normally included as conditions of SMA permits.

Regarding "mandated catchment of construction zone runoff," erosion control plans will include sediment basins and grassing to prevent runoff. The applicant will comply with SMA conditions requiring that best effort measure be taken to minimize runoff sedimentation, and will meet any County requirements for erosion control and flood control. These will constitute mitigation measures.

3. **Flora and Fauna.** In reply to your comments about the vegetation, it should be pointed out that most of the vegetation on the site is not "natural"--either in the sense of being native or naturally occurring (i.e., not cultivated). The botanical survey revealed that the vegetation is typical of dry leeward areas where kiawe (an introduced tree) and exotic weeds and grasses have replaced most native species. Moreover, quite a bit of the vegetation near the shoreline at the project site was planted by Olohana Corporation.

Your conclusion that "fauna will undergo a replacement in numbers and types" is correct, but whether the shift will be to "more human dependent species" is questionable. Most of the changes will be due to habitat alteration; for example, the indigenous Pacific Golden Plover will be attracted to the golf course areas, and other species will be attracted by the wetter conditions. Please reread pages IV-31 to 32 in the Draft EIS.

4. **Socioeconomic Considerations.** It cannot be concluded that "there will be major infrastructure expenditures by the government to satisfy the needs caused by this development." Such expenditures may be required as a result of cumulative development in the region. The impact of South Kohala Resort on public services is discussed in Chapter V, Section 5 (starting on page V-109).

You state the following: "Taxes must and will be raised to pay expenses. Bonded indebtedness (sic) will increase. User fees will increase." None of these are automatic "givens." In fact, just the opposite may be the case. Taxes are increased when revenues cannot keep up with expenses. However, revenue generated by South Kohala Resort is expected to pay for the required levels of government services several times over.

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Your statement that "airport and harbor facilities are already strained to capacity and beyond" cannot be accepted without clarification. The conclusion reached in the Draft EIS is that the proposed resort is not expected to have a significant effect on Keahole Airport's service, but that improvements to the airport will eventually be required as a result of cumulative developments in West Hawaii. See page V-98 in the Draft EIS for a listing of current and planned improvements at Keahole. Regarding Kawaihae Harbor, the recent dramatic increase in cargo movement is mentioned in the Draft EIS; also mentioned are steps being taken by the State Department of Transportation to expand and improve facilities to accommodate these changes.

The issue of "public indebtedness" is not relevant to airport improvements, since these are funded through revenue bonds, and the statewide airport system is self-supporting. CIP projects for commercial harbors, on the other hand, are financed through general obligation bonds. The State assumes a relatively small share of the cost for harbor works and a somewhat larger share for shoreside facilities.

We also question your statements that "private and public mass transit facilities must be expanded to meet demand," and that "buses and/or a rail system will be needed immediately." It is not prudent to jump to these conclusions without first determining actual demand for mass transit services, since these are seldom self-supporting and most likely would require subsidies. Mass transit is usually a viable alternative only in more densely populated areas.

6. Air Quality and Noise. Some of your statements have been made without regard to the findings disclosed in the EIS. For example, hotel maintenance equipment will not be "an ongoing persistent annoyance due to noise and odor or chemicals/exhaust." Please refer to Section 4.3.2.2 on page V-108. Construction activities and their impacts will be temporary, and mitigation measures will be implemented to assure that they do not "significantly diminish the recreational experience at Hapuna Beach." SMA conditions pertaining to air quality and noise will mitigate any potential impacts.

Moreover, your statement that "helicopter facilities and activity is (sic) now a major noise generator at Kaunaoa Beach" is doubtful. The Westin Mauna Kea has a helipad located in the golf course area near the maintenance building, but it is no longer used for sightseeing purposes. It is currently maintained primarily for emergency use, such as medical evacuations, and secondarily for special security situations. Hence, the Mauna Kea Resort helipad receives minimal use. We have stated in the Draft EIS that a helicopter landing area is not now planned for South Kohala Resort.

The issue of carbon monoxide has been addressed above.

Odor generation was not discussed in the Draft EIS because it is considered insignificant. You can be assured that facilities will be designed to prevent kitchen and other odors from disturbing the guests, who will be much closer to the sources of such odors than beach goers. It could be argued that the public beach park generates its share of cooking odors, smoke, and automobile exhausts, and whether these "have a very adverse effect on the the beach public's (sic) experience of nature and the natural setting" is debatable.

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Your conclusion that "stress of changes caused by this development will bring about unwanted social hostility and disharmony" is not supported by Community Resources, Inc.'s socioeconomic study. We ask that you review the section in the Draft EIS on "Statistical Indicators of Community Cohesion," starting on page V-66. The inference that South Kohala Resort will cause increases in crime, sickness, and mental illness cannot be generalized from current conditions in West Hawaii, situations in other resort areas, or from Toffler's *Future Shock*.

In reply to your comments about the revenue-cost analysis, most of the items listed in your letter are costs to citizens and other private entities, but the analysis focused on *public* (government) costs and revenues. Please refer to the section on Excluded Variables in Appendix J of the Draft EIS (page J-4). User fees (e.g., highway costs paid through gasoline and weight taxes, airport facilities paid for through revenue bonds, landing fees, concession rental income, etc.) are costs assumed by the user and are not costs to the State or County. As such, these are considered "wash" costs. CIP projects financed through general obligation bonds are a public cost and are accounted for in the analysis. An exception to this would be the new \$1.1 million fire/police/emergency medical facility just south of the proposed South Kohala Resort. It is funded by County general obligation bonds, but the principal and interest are being paid by the Kohala Coast Resort Association. Answers to your other questions are as follows:

- o You want to know what portion of revenue goes out of County government and never returns. The point of your question is unclear, but if you are asking whether the County retains all of its revenues for its own use, the answer is "yes." Whatever is collected from property taxes is available for funding County facilities, services, and programs. When the County uses these revenues to purchase goods and services, however, a percentage of it goes outside the County. For example, most of the equipment for the fire and police departments was probably manufactured on the mainland, and the County funds used to purchase them "will never return."
- o Gross revenue figures are used in the analysis.
- o The revenue figures are based on 70 percent occupancy. This and other study parameters and assumptions are listed on page V-83 of the Draft EIS.
- 5. Transportation. The possible impacts on West Hawaii's transportation facilities have been disclosed in the Draft EIS. More frequent road maintenance, as well as roadway and intersection improvements to keep traffic flowing smoothly, will very likely be required. However, we wish to respond to your statement that "noise and air pollution will increase significantly in the project area and outside it." A detailed modeling study was conducted to calculate possible carbon monoxide concentrations as a result of the project. Even under worst case traffic and meteorological conditions, carbon monoxide levels would be well within allowable State and Federal air quality standards after project completion. A modeling study was also carried out to project traffic noise levels attributable to the proposed resort and other developments in the region. As stated on page V-106 of the Draft EIS, "it can be concluded that two existing homes within The Fairways at Mauna Kea South will experience traffic noise levels above 55 but below 65 Ldn--a change from 'Minimal' to 'Moderate Exposure.'" Other existing homes are expected to remain in the 'Minimal Exposure' noise category."

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7. Proposed Mitigation Measures. Your suggestions, as well as those of others, could be referred to the County Planning Department and Planning Commission for their consideration in setting permit conditions.

8. Summary of Alternatives. The alternative of the State concerning the hotel parcel was considered in Chapter III of the Draft EIS. However, it is highly unlikely since the hotel parcel is appropriately zoned by both the State and County. We also considered the alternative of the land being sold to the State or County (see page III-3). This would entail a major shift in government policy and require a significant commitment of funds. We understand that there has been no discussion by either the State or County concerning acquisition of this land.

You state that "the project should be allowed to continue but not as planned." The possibility of constructing the proposed hotel on the rocky shoreline between Hapuna and Kauna'oa Bays was not considered because it is not an alternative "which could feasibly attain the objectives of the action" (Section 11-200-17(f) of Title 11, DOH Chapter 200 EIS Rules). As stated in the Draft EIS, the objective is to develop an economically viable luxury destination resort community on oceanfront property adjacent to Hapuna Bay. One of the special features most sought in a luxury resort hotel in Hawaii is close proximity to a sandy beach suitable for swimming. This feature is required to give South Kohala Resort a competitive edge in attracting clientele. Moreover, the parcel between Hapuna and Kauna'oa Bays is zoned for multifamily residential use, and any other use would entail an application for rezoning.

Another reason why the site between the two bays was not included as an alternative is because of the significant visual impacts. As the resort is currently planned, the hotel would be set back and its visual impact on the southern-portion of Hapuna Beach minimized. A hotel located on the elevated rocky shoreline between Hapuna and Kauna'oa Bays would be much more visible from both the park and the main highway, and the view of the ocean from lands mauka of the hotel would be blocked.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



October 12, 1987

Mr. Albert Lyman, Director  
County of Hawaii Planning Dept.  
25 Aupuni Street  
Hilo, HI 96720

Dear Mr. Lyman:

Here are our comments on the Draft EIS for the South Kohala Resort:

First, it is evident that a conscious effort has been made to address and further research some of the important issues that surfaced during earlier public discussions. Examples are: (1) a marine survey in summer as well as winter; (2) inclusion of the specific agricultural chemicals that will be used; (3) a continuation of the beach surveys at Hapuna; and (4) extensive attention to the cumulative effects of overall West Hawaii resort development. Also appreciated is the readability and absence of "glossy" self-serving text.

Naturally we have some disagreements and additional requests as follows:

1) Quotes from page III-1 of the Draft EIS: In paragraph 2, "The proposed action is to provide shoreline improvements as an integral part of the proposed South Kohala Resort..." In paragraph 3, "A distinction should be made between the proposed action and the proposed project, which is the development of the entire South Kohala Resort."

The distinction made is not a proper one. Dept. of Health Rules 11-200-7 state that "A group of actions proposed by an agency or an applicant shall be treated as a single action when (1) the component actions are phases or increments of a larger total undertaking..." Thus the entire South Kohala Resort is the "action" as defined by State of Hawaii EIS Regulations.

The point is supported by Judge Kimura's Amended Decision and Order in Civil No. 85-688. With regard to the scope of the Planning Director's assessment under EIS Rules and Regulations, "The Planning Director was required to consider the entire project in making his negative declaration." (Section C-12)

Thus the entire project must be considered when addressing "Alternatives to the proposed action", as well as in all other facets of the EIS.

(2) With regard to alternatives, in our letter of 12/27/86 Life of the Land requested that an alternative hotel site north of Hapuna be considered in order to reduce visual impacts. However the response by Bert Collins (July 20, 1987) stated that alternative sitings had been explored and rejected. Obviously the proposed siting is preferable in the eyes of the developer, but the EIS law requires of the draft EIS a rigorous explanation and objective evaluation of the environmental impacts of all reasonable alternative actions, particularly those that might enhance environmental quality... (11-200-17f)

**BELT COLLINS  
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December 16, 1987  
87-2469

Mr. Bill Graham  
Life of the Land Big Island Representative  
P. O. Box 155  
Hawi, Hawaii 96719

Dear Mr. Graham:

**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter to the Hawaii County Planning Department dated October 12, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your comments and suggestions are as follows:

1. **Proposed Action and Proposed Project.** You have stated that we should not make a distinction between the proposed action (shoreline improvements within the setback) and the proposed project (the entire resort). We have made this distinction for two reasons: (a) to clarify the purpose of the EIS, which is to accompany an application to the County for a shoreline setback variance; and (b) to highlight the objective of the action (to make improvements to the shoreline area which would enhance the resort) and the overall, long-term objective of the project (to develop an economically viable luxury resort community on the proposed site). However, when it came time to analyze the various impacts and alternatives, we addressed both the proposed action and the proposed project. Please refer to page III-1 of the EIS, where we state that "Various alternatives were considered but most were rejected as not attaining the objectives of the action *and* the project." (italics added)

2. **Alternate Hotel Site.** You have suggested construction of the proposed hotel on the rocky shoreline between Hapuna and Kauna'oa Bays. This possibility was not considered because it is not an alternative "which could feasibly attain the objectives of the action" (Section 11-200-17(f) of Title 11, DOH Chapter 200 EIS Rules). As stated in the Draft EIS, the objective is to develop an economically viable luxury resort community on oceanfront property adjacent to Hapuna Bay. One of the special features most sought for in a luxury resort in Hawaii is close proximity to a sandy beach suitable for swimming. This feature is required to give South Kohala Resort a competitive edge in attracting clientele. Another reason why the site you have proposed was not included as an alternative is because of the significant visual impacts. As the resort is currently planned, the hotel would be set back and its visual impact from the southern portion of Hapuna Beach minimized. A hotel located on the elevated rocky shoreline between Hapuna and Kauna'oa Bays would be much more visible from the park and from the main highway. Also, the view of the ocean from lands mauka of the hotel would be blocked.

In earlier plans for South Kohala Resort, the land between Hapuna and Kauna'oa Bays was the site for "The Bluffs," composed of multifamily residential units. These plans were subsequently revised and the parcel included as part of Mauna Kea Resort. The site is no longer part of the South Kohala Resort project. Moreover, "The Bluffs" site is zoned for multifamily residential use and would have to be rezoned for any other use.

p2

The proposed alternative siting was in the area of the Bluffs Condominium project. Even though the EIS prep notice makes specific reference to the Bluffs Condominium project, it has apparently been removed from the South Kohala Resort project, without explanation. The final EIS should address this matter in a forthright manner.

3) The hotel structure itself has been completely redesigned from the plans which were submitted in 1985. Apparently it will be somewhat less visually intrusive than the original long single building. Although various Plans and Sections of structures within the resort are included, there is no frontal viewplane as seen from the beach. Amongst the letters which are appended to the draft EIS is a request by Judy Graham for just such a view. The Belt Collins reply to Ms. Graham indicates their intention to supply the requested view, yet it is not in the draft EIS. It should be included in the final EIS since it is the best possible reference for evaluating visual impacts.

4) Congestion of Hapuna Beach is a major concern, and the draft EIS explains the status of the State plan to expand Hapuna State Park in section 6.1.2.3. However, the EIS wrongly claims there is a 1400-foot long beach at Wailea Bay. The final EIS should ascertain the actual length of beach frontage at Wailea Bay. Our estimate is that the sand area at Wailea is not even 10% of the sand area at Hapuna, although the beach is several hundred feet long.

5) The housing analysis was done in depth, but is no longer even approximately valid. Interest rates have gone up more than 1.5% since early 1987 so that typical home mortgages now run at least 11%, which is not even shown on the tables that are in the draft EIS. Furthermore, 1987 has seen a considerable increase in both rental and purchase costs for West Hawaii housing.

Obviously one cannot continually redo all one's work to make it completely current. However, using the same analytical framework, the final EIS should incorporate numbers which reflect the current financial situation. The impact on housing will be that a much higher proportion of workers will need some sort of housing assistance.

6) Notwithstanding our complement about the EIS having avoided "self-serving" material, the last sentence in Chapter VIII offends common sense.

Although our requests entail extra effort on the part of Belt Collins, we believe they are confined to areas of major importance and are necessary. Hopefully our early submission of these requests will alleviate delays.

Sincerely,  
Bill Graham  
101. Big Island Rep.  
P.O. Box 155  
Hawi, HI 96719

Mr. Bill Graham  
December 16, 1987  
Page 2

3. **Visual Impact.** As requested, illustrations showing views of the hotel from various perspectives on the beach will be provided in the Final EIS.

4. **Waialea Bay.** We have checked the Soil Conservation Services's *Soil Survey of the Island of Hawaii* and the Hapuna Beach State Park master plan prepared by Charles Yoon and Associates to verify the length of the beach at Waialea. Examination of maps in these sources confirm that the beach is about 1,400 feet long.

5. **Housing Analysis.** We concur with your observation regarding the volatility of interest rates for home mortgages. Indeed, since your letter of October 12, interest rates have again begun to come down, with Adjustable Rate Mortgages at 7.5 percent and fixed-rate mortgages available at 9.5 percent (as of November 20). Because of this volatility, we based projected housing need not on for-purchase housing prices (which cannot be predicted for even the near term), but rather on government program standards which remain valid relative to changes in the economy. Within this context, households making less than 80 percent of the median income are expected to need some degree of assistance, whether it be to purchase housing (which we believe is extremely difficult for this portion of the population) or for rentals. The number of units required by this segment of the population, as well as the purchase or rental price, would thus remain relatively constant over time.

6. **Mitigation Measures.** The last sentence in Chapter VIII will be revised in the Final EIS.

Thank you for your cooperation. We hope that the issues raised in your letter have been adequately addressed.

Sincerely,

*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

Box 1366  
Kamuela, HI 96743  
November 8, 1987

Mr. Albert Lono Lyman, Planning Director  
County of Hawaii  
25 Aupuni Street  
Hilo, HI 96720

Re: South Kohala Resort EIS

Dear Mr. Lyman:

My comments pertain to revenue/cost analysis, population projections and housing matters.

1. UNUSUALLY HIGH REVENUE/COST ANALYSIS

This EIS projects a revenue/cost ratio for state and county government of 9.3 as a result of the SKR (p. V-87). This is higher than ratios submitted by other West Hawaii developers, even those with comparably luxurious projects which also have residential components. In addition, important variables such as transportation costs, CIP expenses based on bond issues, etc., have been excluded from the analysis. Therefore the EIS's revenue/cost analysis appears unrealistic.

Can Belt Collins therefore justify its approach or offer an alternative revenue/cost analysis which includes the excluded variables?

In addition, I have prepared below a sample revenue/cost analysis based on Belt Collins' population figures and on costs that the Tax Foundation of Hawaii found would accrue to government for per capita new state residents and per capita tourists. The Tax Foundation figures were used in both the Punaluu and Makalawena EISs. Assuming 60% of the off-site population impact is immigrant, as Belt Collins does (p. V-40), the revenue/cost ratio by this method is .79, a negative ratio. Assuming more conservatively a 30% immigrant factor, the revenue/cost ratio obtained is a very marginal 1.34.

Can Belt Collins proffer reasons why my analysis should be rejected?

## 2. ALTERNATIVE SAMPLE REVENUE/COST ANALYSIS

In 1984 the Tax Foundation of Hawaii published per capita annual expenditures per resident and per visitor. Each new resident costs the state about \$2,000, the county \$538. Annual per capita costs for visitors are \$340 state and \$209 county.

For simplicity, all SKR on-site population may be counted as visitors, the lower figure. Average on-site population is expected to be 1,136 persons (p. V-17), multiplied by \$549, gives \$623,664 in visitor costs annually.

About 60% of offsite population impact is anticipated to be immigrant (p. V-40). Off-site population impacts may therefore be calculated at 1,900 offsite population impact x 60% = 1,140 x \$2,538 = \$2,893,320 resident costs annually.

SKR revenues to government over a 15-year period are estimated at \$41.7 million. Costs by the method above will be \$3,516,984 x 15 = \$52.7 million.

The ratio in that case is .79. Allowing only 30% immigration, the ratio rises to 1.34.

It may be objected that all in-migrant workers may not be new to the state. However, I believe we should apply on a statewide basis the following principle which the SKR EIS admirably applies on a regional basis. To wit: "If someone leaves another job in West Hawaii to work at the South Kohala Resort, that person's replacement and his/her housing need is counted as a South Kohala Resort impact." (p. V-43).

The principle would be that immigration between islands will still leave a statewide shortage. For example, immigrants drawn from Oahu, where West Beach will require 5,000 workers (Advertiser 12/7/86), where the Kullima is expanding, etc., would create a labor gap there, and require out-of-state immigration to Oahu. The labor shortage on Maui is well known. Alternatively, in light of the known projects scheduled for Oahu and Maui, can Belt Collins assert there is an available labor surplus on those islands and that in-migrant labor required here would not have the effect I have suggested?

## 3. POPULATION IMPACT ANALYSIS

For reasons given below, I request an alternative population impact forecast based on the DAHI 2.07 multiplier for operational employees, as originally requested by government.

a. The population impact estimates in this EIS depart substantially from those given in the Assessment prepared for the same resort. Belt Collins' original 1984 Assessment projected de facto population increases of from 4,255 to 5,285 persons (pp. III-98, 99). But the present EIS forecasts de facto population impacts as 3,050 persons (p. V-40). I believe this deserves explanation.

b. Population estimates are short-term. This EIS uses a 1.46 multiplier applied to immigrant employees to estimate off-site population impacts (V-38). It does so based on a study which observed that in-migrant employees, living in Hawaii 5 years or less, had .46 dependents/relations and were predominantly single.

This multiplier is merely "immediate," as the EIS acknowledges (p. V-43). In the sixth or seventh year the immigrant may acquire spouse and children. The multiplier will prove misleading for estimates of education expenses, for example.

c. The multiplier used for off-site population impacts appears to describe undesirable social conditions. Other EISs, including those for Kukio, Makalawena, Mauna Lanii and Awakee Resorts, anticipate one dependent (who may be working) per operational employee, hence use a multiplier of 2. The Original Assessment for the SKR used a multiplier of 2.3 to figure off-site population impacts (III-98). In this EIS, resident workers already living here are described as having 2.07 persons/household.

The 1.46 multiplier used only for immigrants projects for them a different and in my view much less wholesome lifestyle. A description of present in-migrant patterns, which may be both temporary and socially undesirable, should not be projected as an acceptable future norm--which is what the 1.46 multiplier does. The EIS's mention of potential dormitory housing for in-migrant workers (p. V-54) further heightens serious, legitimate concern for the social well being of in-migrant workers.

Actually the situation projected here bears a resemblance to labor immigration for the sugar plantations. In 1893 an investigator for the US Congress found the Japanese labor force to consist of 10,079 males and 2,281 females-- a multiplier of about 1.22.

South Kohala Resort (4)

4. HOUSING

a. The EIS states that there is a "relative abundance of reasonably priced lots in the area" (p. V-54). As a resident, I find this statement untrue. Would the EIS please give numbers, districts and prices for the lots it has in mind?

b. The EIS asserts that 75% of SKR workers will be able to afford a home priced above \$70,000--a conclusion based on the understanding that 75% of worker households will earn at least 80% of West Hawaii's \$25,000 annual median household income (p. V-48).

However, this median household income is typically based on two wage earners. But about 60% of the SKR workforce would be immigrant, and the 1.46 multiplier does not provide for two wage earners. Typically, non-related persons do not purchase a house or lot jointly. Therefore it is inaccurate to say that 75% of SKR workers will be able to afford the home described. Rather, apparently 60% of them must be renters. Can Belt Collins correct the original, misleading impression?

5. SHORELINE

The EIS states that no structure will be built between 100 and 250 feet of the shoreline (p. V-142). However, the illustration on the facing page shows several 2-story buildings, a 4-story building, swimming pools and spa built between 100 and 200 feet of the certified shoreline. Would the EIS correct or explain this?

I appreciate your consideration of these points.

Sincerely,

*Judith Graham*  
Judith Graham

TABLE IV-40

County of Hawaii Per Capita Government Expenditures

1984

| Function                  | Expenditures<br>(000s)(1) | Service<br>popula-<br>tion(2) | Per<br>resident | 1984 annual<br>expenditure<br>Per<br>resident |
|---------------------------|---------------------------|-------------------------------|-----------------|-----------------------------------------------|
| General government        | \$ 8,157                  | 108,800                       | \$ 76.38        | -                                             |
| Public safety             | 22,701                    | 114,800                       | 198.09          | 198.09                                        |
| Highways                  | 5,214                     | 114,800                       | 45.50           | 45.50                                         |
| Health and sanitation     | 2,922                     | 114,800                       | 25.50           | 25.50                                         |
| Public welfare            | 2,408                     | 108,800                       | 22.53           | -                                             |
| Education                 | 281                       | 108,800                       | 2.63            | -                                             |
| Recreation                | 5,300                     | 114,800                       | 46.25           | 46.25                                         |
| Interest                  | 3,583                     | 108,800                       | -               | -                                             |
| Bond redemption           | 1,177                     | 108,800                       | -               | -                                             |
| Retirement and pension    | 7,485                     | 108,800                       | 70.09           | -                                             |
| Mass transit              | 1,342                     | 108,800                       | 12.57           | -                                             |
| Cash capital improvements | 2,891                     | 114,800                       | 25.23           | 25.23                                         |
| Miscellaneous             | 1,442                     | 108,800                       | 13.50           | -                                             |
| Total                     | \$ 84,881                 |                               | 538.28          | 340.57                                        |

(1) County operating expenditures for fiscal year ended June 30, 1984 (Tax Foundation of Hawaii, Government in Hawaii, 1985, page 47).

(2) Resident or de facto population estimates for the county as of January 1, 1984.

Source: Peat, Marwick, Mitchell & Co.

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December 16, 1987  
87-2470

Ms. Judith Graham  
Box 1366  
Kamuela, Hawaii 96743  
Dear Ms. Graham:

**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter to the Hawaii County Planning Department dated November 8, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your comments are as follows:

1. **Unusually High Revenue/Cost Analysis.** It is true that the revenue/cost ratio of 9.3 is higher than those submitted by other West Hawaii resort developments. There are two reasons for the higher public revenues:
  - o Based on Mauna Kea Resort's experience, it is projected that land values created by the South Kohala Resort project will result in the collection of more real property taxes.
  - o More general excise taxes will be collected due to the type of clientele the resort will attract. As is the case at Mauna Kea Resort, guests will spend a considerable amount on their rooms, food and beverages, golf, tennis, and purchases in the shops.
- Regarding public costs, the major costs of lower and higher education will be minimized because the buyers of residential units will be older families with fewer children of school age.
2. **Important Variables Excluded.** In your letter, you state that variables such as transportation costs, CIP expenses based on bond issues, etc., have been excluded from the analysis. Please refer to the section on Excluded Variables in Appendix J (page J-4). User fees (e.g., highway costs paid through gasoline and weight taxes, airport facilities paid for through revenue bonds, landing fees, concession rental income, etc.) are costs assumed by the user and are not a cost to the State or County. As such, these are considered "wash" costs.

CIP projects financed through general obligation bonds are a public cost and are accounted for in the analysis. An exception to this would be the new \$1.1 million fire/police/emergency medical facility just south of the proposed South Kohala Resort. It is funded by County general obligation bonds, but the principal and interest are being paid by the Kohala Coast Resort Association.

3. **Alternative Sample Revenue/Cost Analysis.** According to your alternative analysis, each new resident would cost the State about \$2,000 and the County, about \$538, and each new visitor would cost the State \$340 and the County, \$209. You have multiplied these costs by 15 years to arrive at a total cost of \$52.7 million.

TABLE IV-42  
State of Hawaii Per Capita Government Expenditures

1984

| Function                                 | Expenditures<br>[000s](1) | Service<br>popula-<br>tion(2) | 1984 annual<br>expenditure |                |
|------------------------------------------|---------------------------|-------------------------------|----------------------------|----------------|
|                                          |                           |                               | Per<br>resident            | Per<br>visitor |
| General government                       | \$ 128,131                | 1,028,500                     | \$ 124.58                  | -              |
| Public safety                            | 73,344                    | 1,127,700                     | 65.04                      | 65.04          |
| Highways                                 | 49,041                    | 1,127,700                     | 43.49                      | 43.49          |
| Natural resources                        | 17,172                    | 1,127,700                     | 15.23                      | 15.23          |
| Health and sanitation                    | 72,631                    | 1,127,700                     | 64.41                      | 64.41          |
| Hospitals and institutions               | 114,557                   | 1,028,500                     | 111.38                     | -              |
| Public welfare                           | 328,400                   | 1,028,500                     | 319.30                     | -              |
| Education                                | 696,256                   | 1,028,500                     | 678.96                     | -              |
| Recreation                               | 19,827                    | 1,127,700                     | 12.26                      | 12.26          |
| Utilities and other enterprises          | 76,990                    | 1,028,500                     | 74.86                      | -              |
| Debt service                             | 213,293                   | 1,028,500                     | 207.38                     | -              |
| Retirement and pension                   | 126,006                   | 1,028,500                     | 122.51                     | -              |
| Employees' health and hospital insurance |                           |                               |                            |                |
| Unemployment compensation                | 24,866                    | 1,028,500                     | 24.17                      | -              |
| Grants-in-aid to counties                | 78,278                    | 1,028,500                     | 76.11                      | -              |
| Urban redevelopment and housing          | 18,173                    | 1,028,500                     | 17.67                      | -              |
| Cash capital improvements                | 11,618                    | 1,028,500                     | 11.30                      | -              |
| Miscellaneous                            | 9,987                     | 1,127,700                     | 8.86                       | 8.86           |
|                                          | 25,111                    | 1,028,500                     | 24.42                      | -              |
| <b>Total</b>                             | <b>\$ 2,077,673</b>       |                               | <b>1,999.99</b>            | <b>209.29</b>  |

(1) State operating expenditures for fiscal year ended June 30, 1984 (Tax Foundation of Hawaii, Government in Hawaii, 1985, page 45).

(2) Resident or de facto population estimates for the state as of January 1, 1984.

Source: Peat, Marwick, Mitchell & Co.



Without going into an analysis of the individual cost items and whether the costs are "wash" costs and therefore should be excluded, and without getting into the validity of the off-site population impact (if costs of off-site population are to be included, then revenues should also be included), it should be noted that your \$52.7 million is an arithmetic sum that has not been discounted. Please refer to the section in Appendix J on Present Value Estimation Procedures (page J-2); the following is an excerpt:

In order to evaluate the "flow" of the dollars over time, a method of "compressing" or "reducing" these numbers was needed. Additionally, even without inflation, a dollar 10 years from now will not be worth the same as today. To account for this "time value of money," as well as to compress the flow of dollars, discounting must be used.

The \$42,663,900 of public revenues calculated through our analysis is the present value of the 15-year stream of revenues discounted at 10 percent. Your calculated annual cost of \$3,516,984 over 15 years, discounted at 10 percent, has a present value of \$28,065,632. Assuming that the revenues and costs are comparable (they are not comparable), the revenue/cost ratio would be 1.5 to 1.0.

In response to your question about available labor on the other islands, it is assumed in the Draft EIS that in-migrants will include not only people from the mainland but from the other islands as well, including "urban refugees" from Honolulu. It is also disclosed that new hotels in Hawaii typically obtain many of their initial employees from existing hotels, so the possibility of labor shortage problems being experienced by existing hotels is acknowledged. Discussion of a statewide labor shortage in the hotel industry is somewhat beyond the scope of the EIS, but such a scenario may be advantageous to the worker, who can then command higher wages for his or her services.

It should be noted, however, that Hawaii County has had, in recent years, the highest unemployment rate of all the counties in the state. Also, there is community recognition among government officials, the business community, and labor organizations that the sugar industry on the Big Island is in decline. As an alternative to going off-island to find labor, the resort industry might look to former sugar industry workers as a source of labor.

4. Population Impact Analysis. We believe it is appropriate to base population projections on 1.46 people per new in-migrant worker rather than the DAHI 2.07 figure for the following reasons:

o The County requested that DAHI's figures be used "unless reasons for alternative approaches could be justified" (as noted on page V-12 of the DEIS). The justifications discussed below and in the South Kohala Resort Draft EIS were actually first set forth in the Ritzi-Carlton Mauna Lani EIS earlier this year, which has been accepted by the County.

o The 1.46 figure is actually based on a current time-frame data source--the 1987 survey of Westin Mauna Kea and Mauna Lani employees. Previous EIS assumptions of 2.00 were essentially arbitrary and not based on any data source.

o The DAHI figure of 2.07 was based on U.S. Census data from 1980, and demographic changes since that time have been in the direction of more workers per household and smaller family sizes. Additionally, the DAHI procedure was simply to divide the total West Hawaii population by the total number of West Hawaii employed to obtain the 2.07 ratio. This procedure would include some households where there are no employed persons (e.g., the retired), whereas, the impact assessment need is to estimate the ratio for worker households.

o You are correct in stating that the population estimate is immediate rather than long-term in nature. This EIS (along with the Ritzi-Carlton EIS) is to our knowledge the first in Hawaii even to discuss and disclose the questions about timing and attribution of impacts. So far as we can tell, all or most past EISs have implicitly presented short-term population figures. This has been the case because there is no basis for knowing with certainty whether in-migrant workers will actually produce children, as you suggest, or whether they will out-migrate and be replaced with others. (For that matter, we can't be certain that the original in-migrants do not already have children.)

o Regarding your perception that the 1.46 figure represents "undesirable social conditions" which "should not be projected as an acceptable future norm," please note that (1) population impact forecasts represent objective estimates of future conditions, but policy makers and not impact analysts must pass judgment on normative implications; and (2) the employee survey indicates the ratio for the total Westin Mauna Kea/Mauna Lani workforce was only slightly greater than 1.46--1.56, to be exact. Even among management and supervisory personnel, the ratio was just 1.62. We are not certain why it is necessarily socially undesirable that each worker in West Hawaii is supporting approximately 0.5 dependents.

For all of these reasons, we feel that we have actually been conservative in using the 2.07 figure for even that portion of the workforce expected to come from the local labor supply, and that we are well justified in using the 1.46 figure for the remainder.

5. Housing. You asked for information to support the statement in the Draft EIS that there is a "relative abundance of reasonably priced lots in the area." According to the Multiple Listing Service past sales report conducted in May 1987, 40 houselots were sold in Waikoloa in the \$35,000 to \$40,000 range in the previous 12 months. In addition, the mauka area of Kona has been an active market for both homes and vacant lots. Most available lots were in the 10,000 to 15,000 square-foot range. There were 233 vacant lot sales in the previous 12 months; the average price ranged from \$25,000 to \$40,000.

We generally concur with your observation that many of the workers may be expected to be renters. Please note that on page V-48 of the Draft EIS, we assumed that renting would be most appropriate for those making less than 80 percent of the median income. We also indicated that rentals in the \$300 to \$500 per month range would need to be provided.

County government, however, has typically requested that housing need analyses be conducted in terms of theoretical ability to purchase market housing, even though in real life people may actually choose to rent even when they could afford to buy. Thus, our analysis was carried out in response to government requirements.

Ms. Judith Graham  
December 16, 1987  
Page 4

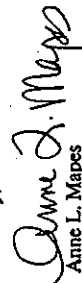
We disagree with your conclusion that the 1.46 multiplier does not provide for two wage-earners. The 1.46 figure represents the ratio of all household members to workers in the household; it says nothing about the actual number of workers within each household. In fact, the survey of Mauna Kea and Mauna Lani employees found that the average number of working persons in the staff households was 2.5. This ratio was even higher--2.8--among recent in-migrants.

We also question your reasoning that since 60 percent of the resort workers would be in-migrants, it follows that fully 60 percent of the workers would be renters. Not all in-migrants consist of single persons who share rental units. According to the employee survey, 63 percent of the recent in-migrants working in the hotels lived in households comprised exclusively of family members. The average number of children among recent in-migrants (1.1) was only slightly lower than the average for all resort workers (1.3). Thus, recent in-migrants (many of whom are of Filipino or Native Hawaiian ancestry) proved only slightly less likely to reside in traditional family households than were more long-term residents.

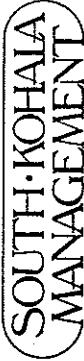
6. Shoreline. The text in the Final EIS will be corrected to read: "no structure will be located within 100 feet of the shoreline" (page V-42).

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



RECEIVED  
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November 8, 1987  
Mr. Albert Lono Lyman, Director  
County of Hawaii Planning Director  
25 Aupuni St.  
Hilo, HI. 96720

BEI, COLLINS & ASSOCIATES

Dear Mr. Lyman:

This letter is a summary of my comments regarding the EIS for the proposed South Kohala Resort at Hapuna Beach.

After spending many hours reading the extensive EIS for the proposed resort it is apparent that Mauna Kea Properties has done their homework with respect to analyzing the impact of this project. It no doubt will be a project of the highest quality construction with attention to every detail. As a property manager along the Kohala Coast, including Mauna Kea Resort, I know that Mr. Mielcke and his staff will do everything in their power to construct a first class facility.

The issue, however, is more than a first class facility and an improved economic climate. The fundamental question is whether or not a hotel on the edge of Hapuna Beach will improve our quality of life in the long run or diminish that quality. Will we live to regret this decision 10 or 20 years from now as we prepare to permanently alter a great masterpiece of nature?

We have seen nature's work altered time and time again across our great country and around this state. We all know of many stories of states like California, Florida, and of course Hawaii where man's needs and desires have overruled our higher sensitivities and later generations lament the permanent loss of masterworks of God.

I make my living off of the tourist industry and I am not suggesting that tourism is bad or that all developers are greedy. I agree with most people that we need development on the big island. The Hyatt at Waikoloa is a good project, in my opinion. The Ritz-Carlton at Mauna Lani is also a good project. Both of these developments take essentially unused areas and improve them. They make things better for all of us to enjoy and to benefit from economically.

But Hapuna Beach is different. The big island lags behind all other islands in tourism. Why? Perhaps the single most important perception among tourists is that the big island lacks beaches. We don't have as many beaches as Maui or Oahu or Kauai but we have more than people realize. Hapuna is the big island's crown jewel of beaches.

The Hawaii State Plan of 1978 outlines broad goals and objectives for growth. Several goals were outlined in the EIS and I will quote:



BEIT COLLINS & ASSOCIATES  
Engineering • Planning  
Landscape Architecture

606 Coral Street, Honolulu, Hawaii 96813 • Phone (808) 521-5361 • Telex BELTH 743074 • Fax (808) 54-  
Hawaii • Singapore • Australia • Hong Kong • S.

December 16, 1987  
87-2471

Section 226-6(b)(14): "Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy." (EIS page VI-3)

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." (EIS page VI-7)

In response to the issue of how the hotel will change the character of the beach the EIS on page V-141 7.2.1 states: "Construction of a 350-room hotel will change the visual character of the site. However, the overall low density of the development and the presence of a golf course will allow the resort to retain an open feeling--much like that at the neighboring Mauna Kea Resort."

As citizens of this island who are looking to the future and not just the present, as sensitive people who know where true values are, we must realize that we are about to give up the purity of our crown jewel. This hotel at the Hapuna Beach location with 350 rooms is not in keeping with the State Plan's goals. A hotel along the rocky coast between Hapuna and the Mauna Kea Beach Hotel would be much more prudent.

I realize that the people at Mauna Kea Properties have worked long and hard for this project. I know that whatever they do they will do with integrity and quality. But sometimes we must look beyond the forest of economic realities that lie in front of us and rise up and heed the calling of higher values.

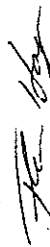
We must realize that:

1. There is only one Hapuna Beach.
2. That Hapuna is the only beach that has not been built upon by private interests that is readily accessible to the public.
3. A masterpiece of nature cannot be improved upon by man.
4. Once it is gone... it is gone forever.

Let us not make the mistake of so many other regretful generations. Let us not alter the finest work of God. Let us not give away our crown jewel.

Thank you for the opportunity to express my views.

Sincerely,

  
Thomas Hagen  
President

cc: William Mielcke/Ms. Anna Mapes

Mr. Thomas Hagen, President  
South Kohala Management  
P.O. Box 3301  
Waikoloa, Hawaii 96734

Dear Mr. Hagen:

South Kohala Resort Environmental Impact Statement (EIS)

We have received a copy of your letter to the Hawaii County Planning Department dated November 8, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to your comments are as follows:

1. Shortage of Sandy Beaches. The first point raised in your letter is the relative shortage of safe, accessible sandy beaches on the Big Island, and hence, the need to preserve Hapuna. This shortage is recognized in the South Kohala Resort Draft EIS. For example, on page V-123, we recount the findings of a DLNR survey that Hawaii has the lowest ratio of park-related beaches to population of all counties in the state: 0.2 acres per 1,000 population, compared to a statewide average of 0.4 acres per 1,000. To help alleviate this shortage, as well as future beach congestion at Hapuna, we suggest on page V-140 of the EIS that more beach parks be developed. There are a number of beautiful, undeveloped white sand beaches in West Hawaii, but they are not accessible to the general public. DLNR's current efforts to prepare an inventory and select sites for future park development are to be encouraged so that these beaches can be enjoyed by all. The expansion of the Hapuna State Recreation Area to include neighboring Waialea Bay would also help to increase the number of sandy beaches with facilities available to Big Island residents and visitors.

It should be noted that many local residents value the calm waters off rocky shorelines just as much as the sandy beaches. West Hawaii is fortunate to have many miles of accessible shoreline featuring magnificent coral reef habitats, and conditions in these areas are ideal for fishing, snorkeling, and scuba diving.

2. State Plan. Your second point is that development of South Kohala Resort at the Hapuna Beach location would not be in keeping with the State Plan's goals relating to the preservation of scenic vistas. The issue of visual impacts is discussed in Chapter V, Section 7 (page V-141). We intend to expand this section in the Final EIS by including illustrations to show views of the resort facilities from various perspectives on the beach. As stated in the EIS, the resort is being designed in such a way to maintain scenic and open spaces, and the generous use of landscaping (including existing vegetation) will aid in minimizing adverse visual impacts.

The Hawaii State Plan provides broad guidelines for the growth and development of the State, and an examination of the various goals indicates a wide range of issues that must be considered and balanced. The EIS process allows us to "test" a proposed project's conformance to these goals. Due to the diversity of the many goals and objectives, they are not always

Mr. Thomas Hagen  
December 16, 1987  
Page 2

compatible with each other, hence, the need for planning high-quality projects such as South Kohala Resort that meet the overall goals of the State Plan--that is, to develop a strong, viable economy while maintaining a desired physical environment.

3. Alternate Hotel Site. You have suggested construction of the proposed hotel on the rocky shoreline between Hapuna and Kauna'oa Bays. This possibility was not considered because it is not an alternative "which could feasibly attain the objectives of the action" (Section 11-200-17(f) of Title 11, DOH Chapter 200 EIS Rules). As stated in the Draft EIS, the objective is to develop an economically viable luxury resort community on oceanfront property adjacent to Hapuna Bay. One of the special features most sought in a luxury resort in Hawaii is close proximity to a sandy beach suitable for swimming. This feature is required to give South Kohala Resort a competitive edge in attracting clientele. Another reason why the site you have proposed was not included as an alternative is because of the significant visual impacts. As the resort is currently planned, the hotel would be set back and its visual impact from the southern portion of Hapuna Beach minimized. A hotel located on the elevated rocky shoreline between Hapuna and Kauna'oa Bays would be much more visible from the park and from the main highway, and the view of the ocean from lands mauka of the hotel would be blocked.

In earlier plans for South Kohala Resort, the land between Hapuna and Kauna'oa Bays was the site for "The Bluffs," composed of multifamily units. These plans were subsequently revised and the parcel included as part of Mauna Kea Resort. The site is no longer part of the South Kohala Resort project. Moreover, the parcel is currently zoned for multifamily residential use and any other use would require an application for zoning change.

To preclude hotel development at the proposed site adjacent to Hapuna Beach, government can initiate rezoning of the parcel and acquire it. Although this option does exist, it has not been exercised and, to our knowledge, there are no plans to acquire the parcel.

Thank you for your cooperation. We hope that the issues raised in your letter have been adequately addressed.

Sincerely,

Anne L. Mapes  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

①

RECEIVED

NOV 10 1987

BELT, COLLINS & ASSOCIATES

Nov. 4, 1987

Alaka Mr. Hagen:

In reviewing the Draft Environmental Impact Statement for the South Kohala Resort, I've found some points need further clarification.

1) William Kelly of B.N.R. and Tom Beach expressed the need for the proposed resort to supply lifeguards. The reply that beach attendants will be providing for proposed resorts brings up the question, will these "beach attendants" be trained lifeguards and will they be elevated in chains? We like to see people in the water in need of help?

2) Many concerns are expressed regarding administration of nearby ocean waters fronting the proposed resort. The claim that "additional input from construction activity would be insignificant" are unsubstantiated.

Another problem of ocean pollution may arise from using sewage effluent to irrigate and fertelize. Because of the difference in soils on this island and Cuba, the Ching & Young study quoted on page B-14 is largely irrelevant. The fact remains that degradation of environmental quality at the expense of the normal ocean community is likely.

Also several case scenarios should be thoroughly addressed, i.e.: sewage effluent spills and herbicide spills. Once again, the statement that "groundwater flow would not have the effect of transporting sediment to the ocean since the water, next acts as a filter," seems unsubstantiated. Even small quantities of pesticides which may reach through soil and lava and carried to the ocean, can be detrimental to the health of humans and organisms in its path. Testing of nearshore waters for chemicals

2.

Nov. 4, 1987  
rainstorms. Water samples should be collected down to the shore, one or two meters; rather than 10, 50 and 100 meters.

An air quality study done by Barry Root he suggests on page H-4 that an quality impact can be mitigated by use of solar energy technologies. It is solar technologies be used at the proposed resort.

On page XII-72 a suggestion is made to include a photo of the north end, the include hotel would be added, with an overlay of the hotel structure. This should be included in the EIS.

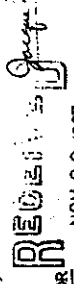
Hopuna is a relatively pristine beach and will be greatly affected by the upcoming population increases. Population impacts of a fully packed hotel and residential neighbor hood overlooking the beach and within walking distance should be included, as well as impact from other developments in North Kona and South Kohala.

The beach in its natural, undeveloped state would be most beneficial to the population in the long run and therefore I would recommend any alternative to building the resort at Hopuna beach.

Thank you,  
Mo. Jaeger Bell  
PO Box 888  
Captain Cook, HI.  
96704

I have included some information on pesticides that should be included in the EIS.

*Altoha*  
This was meant to be enclosed with comments to DEIS on South Kohala



CHLORDANE/HEPTACHLOR

NOV 20 1987

Common Names: Chlordane and Heptachlor

Technical Names:

BEI, COLLINS & ASSOCIATES

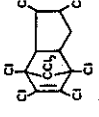
Chlordane: 1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methanoindene

Heptachlor: 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene

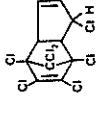
Class: Organochlorines

Molecular Formula and Structures:

Chlordane: C<sub>10</sub>H<sub>6</sub>Cl<sub>8</sub>



Heptachlor: C<sub>10</sub>H<sub>5</sub>Cl<sub>7</sub>



Profile: Residues of these two persistent organochlorine pesticides have been detected in virtually all living systems tested. One U.S. study found metabolites of these substances in 99% of people tested. Chlordane/Heptachlor accumulate in human fat and are also transferred across the placenta from mother to child.

Main Uses: Generally restricted to use in structural pest control (e.g. termites) in industrialized countries, both are widely marketed and used in agriculture in the world.

Principal Manufacturers:

Velsicol Chemical Corp. (USA)

National Regulations:

|                        |                           |
|------------------------|---------------------------|
| Banned                 | Severely Restricted       |
| Finland (Chlor.)       | Norway (Chlor.)           |
| Denmark (Hept.)        | Finland (Hept.)           |
| Japan (Chlor.)         | Denmark                   |
| European Comm. (Hept.) | European Comm.            |
| Turkey                 | Austria (Hept.)           |
| Sweden                 | USSR (Hept.)              |
|                        | United States             |
|                        | Argentina                 |
|                        | Philippines               |
|                        | Canada                    |
|                        | New Zealand               |
|                        | Cyprus (Chlor.)           |
|                        | W. Germany (Chlor. Hept.) |
|                        | Israel (Chlor. Hept.)     |
|                        | Colombia (Chlor.)         |

International Safety Precautions:

The World Bank recommends that they should not be used as pesticides. If used, recommended that a respirator, overalls and protective, impermeable boots be worn.

The Daily Deter Campaign is a public information program... The U.S. Environmental Protection Agency... The U.S. Environmental Protection Agency... The U.S. Environmental Protection Agency...

**Common Name:** Paraquat

**Technical Name:** 1,1'-Dimethyl-4,4'-bipyridinium ion

**Class:** Bipyridyl Compound

**Molecular Formula and Structure:** C<sub>12</sub>H<sub>14</sub>N<sub>2</sub><sup>+</sup>



**Profile:** This potent weed killer is rapidly replacing the plow in many parts of the world as a means of preparing fields for planting. Extremely poisonous when ingested and also toxic when inhaled or absorbed through the skin, paraquat has no known antidote. Paraquat kills by suffocation; autopsies of victims of paraquat poisoning reveal lungs rendered useless by scar tissue. In many Third World countries, this widely available and fast acting pesticide is the suicide method of choice.

**Main Uses:** Paraquat is a contact dipyridyl herbicide widely used in agriculture and horticulture for weed control in establishing crops. It is also used as a harvest aid for some crops, including soy beans.

**Principal Manufacturers:** 1,5

Imperial Chemicals Industries Ltd. (ICI) (UK)  
Cheng Hong Chemical Co. (Taiwan)  
Cemets Chemical Industrial Co., Ltd. (Taiwan)  
Ennore (India)  
Equitable Trading Co., Ltd. (Taiwan)  
GMP International Corp. (Taiwan)  
Inguinosa (Spain)  
Pillar International Co. (Taiwan)  
Shinung Corp. (Taiwan)  
Padang Jawa (Malaysia)  
Sun Lead Chemical, Co., (Taiwan)  
Tong Ho Chemical and Enterprise Co., (Taiwan)  
Veterans Chemical Works (Taiwan)  
Teijin Chemicals (Japan)  
Canamex (Mexico)  
Transquinica (Mexico)  
Visplant-Export S.p.A. (Italy)  
Yuen Fa Chemical Co., Ltd. (Taiwan)

**National Regulations:** 2

Severely Restricted

|         |             |        |
|---------|-------------|--------|
| Sweden  | Philippines | Israel |
| Finland | New Zealand |        |
| Denmark | Turkey      |        |

# HERBICIDE ALMOST TAKES A LEG FROM HIGHWAY WORKER

OSHKOSH, WISCONSIN

"I never asked any questions about things," said AFSCME Local 1903 Trans. Frederick Gehrtke, "but when they want permission to take your leg, you have to pay attention."

This is how the 35-year Winnebago County highway department worker described what happened after he used the herbicide Roundup.

Gehrtke was hospitalized with severe chemical burns and a blood infection after he sprayed this herbicide on a road shoulder. He had been wearing two pairs of coveralls, but the herbicide cut right through them and the herbicide went directly into the bloodstream. "The only warning I received about any hazard was on the label of what was on the herbicide."

Gehrtke was hospitalized with severe chemical burns and a blood infection after he sprayed this herbicide on a road shoulder. He had been wearing two pairs of coveralls, but the herbicide cut right through them and the herbicide went directly into the bloodstream. "The only warning I received about any hazard was on the label of what was on the herbicide."

As the days went by and Gehrtke didn't respond to treatment—his temperature stayed high, his leg was swollen, and his circulation bad—Gehrtke's doctor became more concerned. It was then Gehrtke was asked to authorize amputation of

his leg; there was fear of gangrene. When Gehrtke refused, the doctor tried another treatment he administered through other physicians still said that Gehrtke's temperature started dropping, and the swelling went down. But many jurisdictions are turning to herbicides as a way to cut back on jobs and save money, Gehrtke said. But he continued, "If spraying is done correctly, it costs more than mowing the weeds—masks, coveralls, training at cost money."

Since his injury, Gehrtke has participated in an AFSCME-sponsored safety and health school. "I didn't realize there were so many chemicals being used," he said, recalling what he learned from the training. "They don't give you any warning. The advertising tells you how easy it is, and people get careless. My co-workers are all more careful now," he added, "especially with chemicals. They've cleaned up, and even management is much more careful—they will have certified people spray next year."

"I should have been more careful," he said, "but I just didn't realize what it was."

U.S. DEPARTMENT OF LABOR, BUREAU OF EMPLOYMENT STANDARDS, DIVISION OF OCCUPATIONAL SAFETY AND HEALTH, WASHINGTON, D.C. 20540

OSHKOSH, WISCONSIN

December 16, 1987  
87-2472

Ms. Jacque Prell  
P.O. Box 888  
Captain Cook, Hawaii 96704

Dear Ms. Prell:

**South Kohala Resort Environmental Impact Statement (EIS)**

We have received a copy of your letter to the Hawaii County Planning Department dated November 4, 1987, commenting on the Draft EIS for South Kohala Resort. Thank you for the information on pesticides and herbicides. Paraquat will not be used at the proposed resort and pesticides will be used in relatively small amounts. Please refer to Table IV-7 (page IV-26 in the Draft EIS) for a list of agricultural chemicals used at the Mauna Kea Resort. Similar chemicals are expected to be used at South Kohala Resort.

Our responses to your other comments are as follows:

1. **Beach Attendants.** As is the case at the Westin Mauna Kea, beach attendants at South Kohala Resort will be trained in water safety, advanced first aid, and CPR. They will not serve as official lifeguards, however, since the State will soon be contracting with a concessionaire to provide lifeguard services on Hapuna Beach.
2. **Sedimentation from Construction.** The rationale for the conclusion that sedimentation from construction would be insignificant is to be found on page IV-23 in the Draft EIS. There are two points here: (1) organisms in Hapuna Bay are adapted to extreme conditions and, hence, additional input would have little effect; and (2) runoff during construction is not expected to increase sediment loads since the climate is extremely dry. It should also be noted that the effects of construction are temporary.

The applicant will comply with Special Management Area (SMA) conditions requiring that best effort measures be taken to minimize runoff sedimentation and will meet any County requirements for erosion control and flood control. These will constitute mitigation measures.

The statement in the Draft EIS on page IV-23 that basal rock acts as a filter to prevent groundwater flow to the ocean refers to particulate materials only. In that paragraph, the impact of sedimentation is being discussed, not chemicals.

3. **Pesticides.** In an exhaustive review of the literature on coral reef pollution, Richard W. Grigg and Steven J. Dollar found no documented examples of pesticide problems anywhere in the world. Furthermore, there has been no substantiated evidence of pesticide damage of coral reefs on the Kona coast or the Big Island. (Reference: Grigg, R. W. and S. J. Dollar. (In press). Natural and anthropogenic disturbance on coral reefs.)

4. **Testing of Nearshore Waters.** You suggested that nearshore waters should be tested for chemicals. As stated in Green and Murdoch's report (see page C-6 in the Appendix), sampling for nitrates and total nitrogen is the most realistic way to evaluate the extent of chemical movement, either by runoff or by leaching to groundwater. If nitrate enrichment is evident, then other chemicals could be tested. A routine analysis program for pesticides is not warranted because of the low likelihood of detecting pesticides and the extremely high cost of such analysis.

No potential impacts were identified based on sampling done at this stage of the environmental study. However, over the next few months, we will continue to periodically sample and test water from the stations to verify Green and Murdoch's findings.

It should be noted also that the Hawaii County Planning Department has, in the past year, required developers to implement a water monitoring program as a condition of SMA permit approval. This condition constitutes a mitigation measure for water quality control. The parameters to be tested, however, do not include pesticides.

5. **Water Sampling.** Water samples were collected 10, 50, and 150 meters offshore because these stations are coral reef areas. The whole purpose of the marine study was to establish a baseline to determine the potential impact of the project on nearshore ecosystems, and these are not generally found in the sandy bottom areas a meter or two offshore. As explained in the Draft EIS, coral reefs provide a habitat for other species and serve as an indicator of effects due to pollution (see page IV-19). Even if something were found closer to shore, it would quickly be eliminated by dilution, dispersion, and mixing in the surge zone.

6. **Irrigation with Treated Sewage Effluent.** Degradation of the ocean environment is very unlikely as the result of irrigation with treated sewage effluent. It should be noted that, particularly during the early stages of development, if it were to be used, only a small amount of treated effluent would be available for irrigation, and it would be mixed with brackish water to provide enough water to irrigate the golf course. Moreover, the likelihood of the effluent posing any hazards would be extremely low since it will be chlorinated at the wastewater treatment plant prior to being used for irrigation purposes. For your information, the recycled water is meant only to irrigate and *not* to fertilize the golf course.

The Chang & Young report conclusions are not based on the type of soil beneath the golf course. Chang & Young found that the grass takes up almost all of the nutrients before they even get to the underlying material (soil, lava, or other). Soils on Oahu and the Big Island are different, but this is irrelevant since soils are not a factor in this instance.

7. **Worst-Case Scenarios.** The Department of Health EIS Rules (Chapter 200 of Title 11) require that the possibility of environmental accidents resulting from any phase of the action should be addressed [section 11-200-17(k)]. Section 11-200-17(l) states that the "draft EIS shall address all probable adverse environmental effects which cannot be avoided." It is our belief that the argument for presenting worst case scenarios is a valid one if the consequences of the environmental accident are serious.

Ms. Jacque Prell  
December 16, 1987  
Page 3

Regarding sewage treatment plants, numerous studies have demonstrated the lack of significant impact of sewage outfalls on reef organisms. Please refer to the references cited in Steven Dollar's report (page B-14 in the Appendix). Eutrophication is highly unlikely in Hapuna Bay with its unrestricted circulation. Another possible worst-case scenario as the result of a sewage spill is the release of pathogens into the environment at unacceptably high levels. Sufficient precautions will be taken to minimize the probability of malfunction in the proposed resort's waste treatment system, including the installation of backup pumps and an emergency power generator. Plant operation procedures, such as the daily monitoring of effluent to detect any discharge of micro-organisms, will provide additional margins of safety.

A "herbicide spill" is extremely unlikely given the precautions taken by staff. Even if it did occur, the consequences would be insignificant since quantities used at any given time would be very small. (See Table IV-7 on page IV-26 of the Draft EIS.) For example, herbicides such as Roundup are applied in one quart per acre quantities every four months at Mauna Kea Resort, and others are spot sprayed as needed in similar or lesser amounts. While it is possible that small quantities of applied chemicals may reach the groundwater under conditions of heavy rainfall soon after application, it is unlikely that they could be measured at the low part per billion level. Thus, there is no way that they could pose a hazard to human health at the concentrations likely to be encountered in shoreline waters, if in fact they could reach these waters.

Furthermore, a County SMA permit condition specifies that the use of pesticides and herbicides conform with the applicable regulations of appropriate governmental agencies. Agencies such as the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), and the State Department of Health have strict procedural requirements for handling chemicals.

8. Solar Technology. To date, only conceptual plans have been prepared for the project, and therefore a decision regarding the use of solar technology has not yet been made. The feasibility of incorporating both active and passive solar energy features in the design will be considered as the project progresses.

9. Visual Impact. An illustration showing a view of the hotel from the north end of Hapuna Beach will be provided in the Final EIS.

10. Population Impacts on Hapuna Beach. In preparing the Draft EIS, an effort was made to estimate future use of Hapuna Beach by resort guests, residents, and employees and their families. Beach counts were conducted over a period of time at both Kauna'oa Beach, fronting the Westin Mauna Kea, and at Hapuna Beach. The Kauna'oa counts were taken to examine the pattern of resort guest usage, which is expected to be similar at the proposed South Kohala Resort. See pages V-131 to V-135 for the results of the beach counts.

From the beach counts taken at Kauna'oa, we can tentatively infer a daily average of anywhere from, say, 200 to 450 South Kohala Resort visitors using the beach. These numbers would increase at peak times when occupancy in both the hotel and resort/residential units is highest. (The latter refers to those multifamily units that provide transient accommodations.) We can obtain a rough estimate of beach usage by resort residents by looking at the population projections in Chapter V of the Draft EIS. An on-site residential population of 424 is expected when all units are occupied. Additional off-site population (South Kohala Resort employees and their families who have moved to the area) is projected to be about 1,100. All we can assume at

Ms. Jacque Prell  
December 16, 1987  
Page 4

this time, given these figures, is that usage at Hapuna Beach will increase; extrapolating beach usage estimates from population projections would be difficult. Likewise, we cannot predict the actual extent of population growth due to development of other resorts in the region and, hence, its effect on beach usage at Hapuna.

Any attempt to predict future beach usage cannot be based on the assumption that things will remain "as is" with regard to the availability of recreational resources and facilities in West Hawaii. An intolerably congested Hapuna Beach is not an automatic "given"; government, the public, and the private sector have various options at their disposal to alleviate present and future overcrowding. The purpose of an environmental impact statement is to disclose the potential impacts and provide possible alternatives and mitigation measures. Several suggestions are offered in the South Kohala Resort Draft EIS, such as the expansion of the Hapuna Beach State Recreation Area to include Waialea Bay, as well as the development of other beach parks. DLNR's efforts to prepare an inventory and select sites for future parks are to be encouraged so that presently unaccessible beaches can be enjoyed by all. Furthermore, as new resorts are developed, they will provide shoreline access and facilities--thus opening up more beaches for public use.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

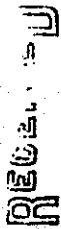
*Anne L. Mapes*  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



NOV 7, 1987

ARI MAPES  
BELLY COLLINS ASSOC  
603 CORAL ST  
HONOLULU HI 96813



NOV 10 1987

BELLY COLLINS & ASSOCIATES

RE: COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR MAUNA KEA  
PROPERTIES HAFUNA BEACH RESORT AND S.KOHALA RESORT

**PARKING**

HOW DO YOU JUSTIFY 40 PUBLIC PARKING STALLS FOR HAFUNA BEACH WHEN YOU ANTICIPATE NEARLY 500 S.KOHALA RESORT RESIDENTS WITHIN 5 YEARS AFTER HOTEL IS FINISHED? ALSO, TAKING INTO CONSIDERATION THE PLANNED FUTURE DEVELOPMENT OF ANOTHER 200 RESIDENTIAL UNITS BETWEEN HAFUNA AND KAUNAOA BEACHES 40 STALLS IS TOTALLY INADEQUATE. WITHOUT YOUR RESORT, PUBLIC PARKING AT HAFUNA IS ALREADY JAMMED ON MANY WEEKENDS WITH PARKING OVERFLOWING ONTO NEARBY STREETS. SHOULD YOUR RESORT BE BUILT ANCHORED TO HAFUNA BEACH AS PLANNED THE IMPACT ON HAFUNA PARKING, EVEN WITH YOUR ADDITIONAL 40 PUBLIC PARKING STALLS, WOULD BE ENORMOUS TO THE EXTENT THAT PUBLIC USERS OF THE BEACH AND PARK WILL BE DISCOURAGED FROM USING IT. FURTHERMORE, PARKING AT NEARBY KAUNAOA BEACH AT THE WEST IN MAUNA KEA WHERE THERE PRESENTLY EXISTS ONLY 10 VIRTUAL STALLS WILL BE TOTALLY DOMINATED BY SNR RESIDENTS TO THE VIRTUAL EXCLUSION OF THE PUBLIC. WE FEAR THAT THE PUBLIC PARKING AREAS AT HAFUNA AND KAUNAOA BEACHES WILL IN TIME BECOME RESORT PARKING LOTS AS RESORT RESIDENTS DOMINATE BOTH OF THEM. THEREFORE THE PUBLIC PARKING AS PRESENTLY PROPOSED IS TOTALLY INADEQUATE. IN LIGHT OF THE ABOVE HOW CAN YOU JUSTIFY A MERE 40 PUBLIC PARKING STALLS FOR HAFUNA BEACH? MANY MORE PARKING STALLS MUST BE PROVIDED TO MITIGATE THE IMPACT OF THE RESORT ON HAFUNA BEACH AND STATE PARK. AND SINCE THE RESORT WILL IMPACT ON THE LIMITED PUBLIC PARKING STALLS AT KAUNAOA BEACH, MORE BEACH ACCESS PUBLIC PARKING THAN THE 10 PRESENTLY PROVIDED ARE SORELY NEEDED.

**BAY POLLUTION**

WHAT WILL YOUR PROCEDURE BE TO MONITOR WATER QUALITY AT HAFUNA BAY IN ORDER TO PROTECT PUBLIC BEACH AND PARK USERS FROM RESORT GENERATED POLLUTANTS?

WE BELIEVE IT IS IN THE PUBLIC INTEREST THAT MORE EXTENSIVE BASELINE STUDIES OF THE WATER AT HAFUNA BAY BE MADE. FURTHERMORE, SHOULD A GOLF COURSE OR HOTEL BE BUILT AS PLANNED, THAT WEEKLY SAMPLINGS OF HAFUNA BAY WATER FOR THE PURPOSE OF MONITORING AGRICULTURAL RUNOFF AND SEWER PLANT DISCHARGE BE MADE TO PROTECT THE PUBLIC FROM RESORT GENERATED BAY POLLUTION.

SINCE YOU OFTEN REFER IN YOUR EIS TO YOUR EXEMPLARY MANAGEMENT PRACTICES AT YOUR NEARBY MAUNA KEA RESORT PLEASE INCLUDE IN THE EIS A COMPLETE RECORD OF THE OPERATION OF THE SEWER TREATMENT PLANT FOR THE MAUNA KEA RESORT AND THE MAUNA KEA BEACH HOTEL PARTICULARLY AS TO THE NUMBER OF LINES IT DROPE DOWN IN THE LAST 10 YEARS, THE CONSEQUENT IMPACT ON KAUNAOA BAY, YOUR PROCEDURE FOR NOTIFYING BEACH USERS AT SUCH TIMES AS FACILITY EQUIPMENT OR OPERATION PUSES A POSSIBLE BEACH THREAT AND YOUR PROCEDURE FOR NOTIFYING WATER QUALITY AT KAUNAOA BAY.

**VIEWPLANE**

ON PAGE V-174, REFERRING TO THE VIEWPLANE OF THE HOTEL FROM THE BEACH FRONTING THE STATE PARK, YOU STATE THAT "MUCH OF THE RESORT WILL BE BLOCKED FROM VIEW BY TREES AND OTHER VEGETATION INCLUDING EXISTING KEAWE BETWEEN THE PARK AND RESORT PROPERTIES". PLEASE PROVIDE IN THE EIS A PHOTO OR DRAWING OF ALL SUCH EXISTING TREES AND VEGETATION THAT SERVE THIS PURPOSE AND STATE WHETHER OR NOT YOU WILL MAINTAIN ALL OF THEM IN ORDER TO PROVIDE MAXIMUM BLOCKAGE OF THE HOTEL FROM THE BEACH VIEWPLANE AS YOU IMPLY.

**HOTEL HEIGHT**

YOU REFER TO "LOW PROFILE STRUCTURES" WHEN IN FACT THE NET EFFECT OF THE TIERED STRUCTURES (I.E. LARGER BUILDINGS PLACED BEHIND SMALLER BUILDINGS GOING UP THE HILLSIDE OVERLOOKING HAFUNA BEACH) IS A MONOLITHIC 100 FOOT HIGH STRUCTURE. WHILE IT IS TO MAUNA KEA PROPERTIES ADVANTAGE TO GET A PUD PERMIT ALLOWING THE HEIGHT LIMIT OF THE REARMOST HIGHEST STRUCTURE TO RISE FROM THE PRESENT LEGAL LIMIT OF 45' TO THE PLANNED 75', IT CERTAINLY WOULD MAXIMIZE THE VISUAL IMPACT OF THE HOTEL FROM HAFUNA. DO YOU AGREE THAT STICKING WITH THE EXISTING LEGAL HEIGHT LIMIT OF 45' WOULD MINIMIZE VIEWPLANE OBJECTIONS FROM HAFUNA BEACH?

YOUR VIEWPLANE CHARTS SHOW THE VIEWPLANE ONLY FROM THE NORTH END OF HAFUNA BEACH. PLEASE PROVIDE VIEWPLANE CHARTS FROM THE MIDDLE AND SOUTH END OF HAFUNA BEACH FROM THE LOW TIDE POINT.

**CLUBHOUSE**

THE BEACH CLUB STRUCTURE IS THE MOST MAKAI STRUCTURE ON THE RESORT PROPERTY AS IT IS LOCATED ON A POINT JUTTING OUT TO THE OCEAN, AND IS THE ONE STRUCTURE THAT CAN BE SEEN BY MOST PARK USERS FROM MOST BEACH LOCATIONS MOST OF THE TIME. THE BEACH CLUB WILL STICK OUT LIKE A SORE THUMB. IT SHOULD BE RELOCATED OUT OF SIGHT FROM HAFUNA BEACH BY MOVING IT EITHER FURTHER MAUKA OR NORTHWARD AWAY FROM HAFUNA BAY, WHILE IT SUITS YOUR PURPOSE TO BUILD IT THERE, IT WILL BE AN NEEDLESS EYEBOLT FOR STATE PARK AND STATE PARK BEACH USERS.

**RECREATIONAL RESOURCES**

YOU NOTE THAT "EVEN DURING TIMES OF HEAVY USAGE WHEN ALL HAFUNA BEACH PARKING STALLS ARE OCCUPIED, THE NORTH THIRD OF THE SANDY BEACH AREA IS NOT AS CROWDED AS THE SOUTHERN TWO THIRDS..."  
THE NORTH END OF THE BEACH IS A BUFFER THAT WILL BE INCREASINGLY NEEDED AND USED BY THE PUBLIC OTHER PLANNED N. & S. MAUNA KEA RESORTS AND RESIDENTIAL DEVELOPMENTS ARE COMPLETED. WHILE THE BEACH MIGHT HANDLE RESORT RESIDENTS (THROUGH PARKING LOTS), THE ADDED IMPACT OF THE GUESTS OF SNR'S HOTEL AT HAFUNA BEACH WILL IN TIME SEVERELY IMPACT ON THE PUBLIC USE OF THIS BEACH. THIS PLANNED RESORT, ANCHORED BY A HOTEL AT HAFUNA BEACH, WILL END UP MAKING OUR ISLAND'S FOREMOST BEACH RESOURCE ITS BACKYARD PLAYGROUND AT THE EXPENSE OF OUR ISLAND'S OTHER RESIDENTS AND OUR ISLAND'S OTHER HOTELS. A HOTEL AT HAFUNA WHILE IT PROVIDES ECONOMIC BENEFITS TO THE COMMUNITY IS THE WORST THING THAT CAN HAPPEN TO THE RECREATIONAL RESOURCES OF THIS ISLAND AND NO MOUNT OF ECONOMIC BENEFIT WILL COMPENSATE FOR THE ULTIMATE REVERSE IMPACT OF THIS HOTEL ON HAWAII ISLAND'S FINEST BEACH. ALL OF YOUR BROT IN THE EIS WHICH SUBJECTS MINIMAL VISUAL AND USER IMPACT OF THE HOTEL ON THE JAWA UNL SHOWS HOW DATA CAN BE MANIPULATED AND DISTORTED TO PRINT BLACK AS WHITE. THE FUTURE WILL SHOW THAT THIS HOTEL, IF IT SHOULD BE BUILT, IS THE WORST EXAMPLE OF MISMANAGED GROWTH ON THE ISLAND OF HAWAII.

OUTLINES' B1, 2 & 3 STATE THAT NO DEVELOPMENT SHALL BE APPROVED UNLESS IT HAS NO SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECTS... JUDGE SHUNICHI KIMURA IN OPEN COURT STATED THAT THIS DEVELOPMENT "WILL HAVE AN ENORMOUS IMPACT ON HAPUNA AND THAT ANYONE WHO SAYS OTHERWISE IS CRAZY". THE WORST IMPACT, I.E. THE HEAVY USAGE OF HAPUNA BY HOTEL AND RESORT RESIDENTS IS NOT MITIGATABLE UNLESS THE HOTEL IS BUILT AT KAUNADA BEACH INSTEAD OF HAPUNA. FURTHERMORE, OTHER DETRIMENTAL IMPACTS THAT ARE MITIGATABLE ARE BEING ENCOURAGED BY THE PLANNING DIRECTOR RATHER THAN BEING MINIMIZED. FOR EXAMPLE HIS SPECIAL APPROVAL TO EXCEED THE LEGAL HEIGHT LIMIT THEREBY ALLOWING THE HOTEL TO BE HIGHER THAN IT WOULD OTHERWISE BE. AS A RESULT OF HIS ACTION THE HOTEL PROTRUDES ABOVE THE TOP OF THE HILL OVERLOOKING HAPUNA ON WHICH IT WOULD BE BUILT. THIS IS ALSO CONTRARY TO GUIDELINE A4 CONCERNING VISUAL IMPACTS. PLANNED USE OF LANDSCAPING DOES NOT MITIGATE THE VISUAL IMPACT CREATED BY A SPECIAL DISPENSATION TO BUILD UP TO 35 FEET HIGHER THAN THE LAW ALLOWS. ALLOWING A BEACH CLUB TO BE BUILT ON THE MOST OBTRUSIVE SITE ON THE RESORT PROPERTY IN RELATION TO HAPUNA PARK AND BEACH MAGNIFIES, INTENSIFIES AND EXACERBATES THE IMPACT RATHER THAN MINIMIZING IT.

**HAPUNA BEACH CONDECTION**  
"IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES"  
ON PAGE VII-1 YOU STATE "THE RECREATION RESOURCES OF HAPUNA BEACH WILL NOT BE DIMINISHED BY THE DEVELOPMENT ITSELF ALTHOUGH IT IS RECOGNIZED THAT THE CUMULATIVE IMPACT OF ALL PLANNED DEVELOPMENT IN THE REGION WILL LEAD TO INCREASED USE OF THIS POPULAR BEACH".

THIS SHOULD BE WRITTEN TO MORE ACCURATELY READ "THE RECREATION RESOURCES OF HAPUNA BEACH WILL NOT BE DIMINISHED BY THE PHYSICAL STRUCTURE THEMSELVES OTHER THAN VISUALLY, BECAUSE IN HAWAII WE ARE NOT ALLOWED TO BUILD ON BEACHES. HOWEVER, WHEN YOU CONSIDER THAT THE CUMULATIVE RESORT PROJECTS IN THE REGION INCLUDING ON-SITE, OFF-SITE AND VISITOR POPULATION ARE PROJECTED AT OVER 25,000 PEOPLE, AND THAT PROPOSED MAJOR RESIDENTIAL PROJECTS IN NORTH AND SOUTH KOHALA AND N.KONA COMPRISE ANOTHER 25,000 RESIDENTIAL UNITS, AND THAT THIS ISLAND WHILE IT IS THE BIGGEST (LESS THAN 1/3 MILE LONG) AND HAS THE FEWEST BEACHES OF ANY, AND THAT HAPUNA IS THE BEST AND MOST POPULAR OF ALL BEACHES, IT IS INEVITABLE THAT A PROJECT THE MAGNITUDE OF THE SKR WHICH IS ANCHORED DIRECTLY TO HAPUNA BEACH WILL HAVE AN INORDINATE AND DOMINANT USER IMPACT TO THE DETRIMENT OF ALL OTHER POTENTIAL USERS. THE PUBLIC BEACH WILL BECOME A DE-FACTO BACKYARD BEACH TO THE SKR RESORT RESIDENTS AND HOTEL GUESTS.

SINCERELY YOURS,  
*J. Rothstein*  
JIM ROTHSTEIN  
515 HAPUNA  
PO Box 1544  
KAILUA-KONA HAWAII 96745

ALTERNATIVES TO THE PROPOSED ACTION WITHING THE 40' SHORELINE SETBACK ONE ALTERNATIVE YOU DID NOT CONSIDER IN YOUR SHORELINE SETBACK VARIANCE, THE ALTERNATIVE THAT COULD PROVIDE YOUR GUESTS WITH ACCESS TO HAPUNA BEACH WHILE MINIMIZING THE IMPACT OF THE HOTEL ON THE BEACH IS TO LEAVE THE EXISTING NATURAL VEGETATION AT THE NORTH END OF THE BEACH INSTEAD OF REPLACING IT WITH HOTEL LANDSCAPING. YOU CAN LANDSCAPE WITHIN THE SHORELINE SETBACK EVERYWHERE ELSE IN THE RESORT AREA BUT THE SETBACK ABUTTING HAPUNA BEACH ITSELF SHOULD BE LEFT INTACT. ANY CHANGES YOU MAKE THAT ENTAIL THE REPLACEMENT OF THE EXISTING VEGETATION WILL TEND TO CREATE THE FEELING ON THE PART OF THE PUBLIC THAT THE NORTH END BEACH IS PART OF THE HOTEL AND WILL DISCOURAGE PUBLIC USE AS WELL AS ALTER THE NATURAL SETTING PROVIDED BY THE EXISTING VEGETATION.

YOU STATE ON PAGE III-2 THAT "PEDESTRIAN ACCESS ALONG THE SHORELINE WOULD NOT BE AS SAFE AND ACCESS TO THE BEACH FROM THE ADJACENT HOTEL PARCEL WOULD BE MORE DIFFICULT". FIRSTLY, ADDRESSING THE "NO ACTION" OPTION TO ONLY THE NORTH END OF THE BEACH, AS PROPOSED ABOVE, AND RECOGNIZING THAT AN ACCESS TRAIL WHICH YOU ARE RESPONSIBLE FOR MAINTAINING ALREADY EXISTS, PEDESTRIAN ACCESS ALONG THE SHORELINE IN THIS AREA IS JUST AS SAFE WHETHER OR NOT YOU LANDSCAPE IN THE SETBACK AT LEAST FOR THE PUBLIC SINCE THEY ARE RESTRICTED TO THE EXISTING ACCESS TRAIL ANYWAY. SECONDLY, IT WOULD BE NO MORE DIFFICULT FOR GUESTS FROM THE HOTEL TO GET TO THE BEACH AS YOU SUGGEST AS ADDITIONAL ACCESSES FROM THE BEACH TO THE HOTEL THROUGH THE SETBACK COULD BE PROVIDED IN LIEU OF GUEST ACCESS THROUGH THE ENTIRE SETBACK FRONTING THE BEACH. THE ONLY DIFFERENCE WOULD BE THAT THE SETBACK AREA WHICH GUESTS WOULD HAVE TO PASS THROUGH WOULD BE "NATURAL" RATHER THAN LANDSCAPED AS YOU WOULD PREFER IT. LEAVING THE NORTH END OF HAPUNA "NATURAL" INSTEAD OF LANDSCAPED IS LITTLE ENOUGH TO MITIGATE SOME OF THE VISUAL IMPACT OF THE HOTEL ON HAPUNA BEACH AND TO PRECLUDE THE BEACH AS BEING PERCEIVED BY THE BEACHGOING PUBLIC AS PART OF THE HOTEL. WHAT YOU DO WITH THE SHORELINE SETBACK IN THE REST OF THE RESORT AREA OTHER THAN AT THE NORTH END OF HAPUNA IS OF LITTLE CONCERN.

ANOTHER ALTERNATIVE YOU WERE ASKED TO ADDRESS BUT FAILED TO WAS TO PLACE THE HOTEL AT KAUNADA BAY INSTEAD OF HAPUNA BAY. SINCE YOU ALREADY DOMINATE KAUNADA BAY WITH THE WESTIN MAUNA KEA AND PROVIDE A NERE 10 PARKING STALLS, YOU CAN BUILD THE HOTEL THERE AND LEAVE HAPUNA AS IS. YOU STATE ON PAGE III-3 THAT THE ALTERNATIVE OF A DIFFERENT LOCATION FOR THE HOTEL WAS REJECTED BECAUSE IT IS "NOT VIABLE FOR A LUXURY RESORT IN HAWAII TO BE LOCATED AWAY FROM THE OCEAN". PLACING THE HOTEL AT KAUNADA BEACH AT THE NORTH END OF THE RESORT SITE MEETS THIS CRITERION. KAUNADA BAY PROVIDES "SHORELINE VIEWS AND ACCESS TO A BEACH AREA" WHICH YOU CLAIM IS SO VITAL FOR SUCCESS.

INCOMPATIBILITY OF THE PROJECT WITH COUNTY SPECIAL MANAGEMENT AREA GUIDELINES.  
THIS PROJECT IS NOT CONSISTENT WITH COUNTY LAND USE POLICIES. GUIDELINES A2&3 SEEK TO MINIMIZE REDUCTIONS IN THE AVAILABILITY OF RECREATIONAL AND SHORELINE AREAS. HAWAII ISLAND IS LARGER THAN ALL THE OTHER ISLANDS COMBINED YET HAS THE FEWEST BEACHES OF ANY. BEACHES ARE A SCARCE RESOURCE ON HAWAII AND HAPUNA IS THE BIGGEST AND BEST OF ALL USED BY MORE LOCAL RESIDENTS ISLAND-WIDE AND BY MORE ISLAND VISITORS THAN ANY OTHER BEACH. A LARGE SCALE RESORT SUCH AS THIS ANCHORED TO HAPUNA BEACH BY A 300 ROOM HOTEL WILL MAKE HAPUNA A BACKYARD PLAYGROUND TO THE RESORT RESULTING IN DISCOURAGING AND LIMITING PUBLIC USE OF THIS PRIME BEACH AREA. IF THIS GUIDELINE HAS ANY MEANING WHATSOEVER IT IS TO PREVENT A HOTEL AT HAPUNA.

December 16, 1987  
87-2473

Mr. Jerry Rothstein  
Save Hapuna Initiative Petition  
P.O. Box 1544  
Kailua-Kona, Hawaii 96745

Dear Mr. Rothstein:

South Kohala Resort Environmental Impact Statement (EIS)

We have received your letter of November 7, 1987, commenting on the Draft EIS for the proposed South Kohala Resort. Our responses to each of the issues raised are as follows:

1. **Parking.** In accordance with the approved SMA permit, public parking and a public right-of-way to the shoreline will be shown on the site plan in the Final EIS as located adjacent to the resort's boundary with Hapuna Beach State Recreation Area. An alternative would be for the applicant to provide additional parking at the north end of the State park.

Public parking at Mauna Kea Resort has been provided in accordance with the 1979 easement agreement with the County and settlement of the class action suit in which the public users, State, and County were parties.

2. **Bay Pollution.** Your request for more extensive baseline studies and an ongoing water quality monitoring program at Hapuna Bay is based, it would seem, on the assumption that there would be significant impacts on nearshore water quality as a result of the development. Evidence contained in the Draft EIS indicates that this would not be the case. The project does not involve work in nearshore waters, and the impact from construction activities, agricultural chemicals, the sewage treatment plant, and use of treated effluent to irrigate the golf course would be minimal. The baseline study, conducted during both the winter and summer months, provided useful information without excessive cost at this stage of the environmental study. The same can be said for Green and Murdoch's study. No potential impacts were identified in their analysis of the samples taken; however, over the next few months, we will continue to periodically sample and test water from the same stations, as well as the lower irrigation well, to verify their findings.

It should also be noted that the Hawaii County Planning Department has, in the past year, required developers to implement a water monitoring program as a condition of Special Management Area (SMA) permit approval. This condition constitutes a mitigation measure for water quality control.

Regarding sewage treatment plants, numerous studies have demonstrated the lack of impact of sewage outfalls on reef organisms. Please refer to Steven Dollar's report (page B-14 in the Appendix). Eutrophication is highly unlikely in Hapuna Bay, with its unrestricted circulation. You state in your letter a concern about the possibility of the sewage treatment plant "breaking down." Sufficient precautions will be taken to minimize the probability of malfunction in the proposed resort's waste treatment system, including the installation of backup pumps and an emergency power generator. Plant operation procedures, such as the daily monitoring of effluent to detect any discharge of micro-organisms, will provide additional margins of safety against the release of pathogens into the environment at unacceptable levels.

Mr. Jerry Rothstein  
December 16, 1987  
Page 2

In response to your request for a record of operations at the Mauna Kea Resort wastewater treatment plant over the last ten years, we spoke to Mr. Ray Seaver, Director of Engineering. Mr. Seaver, who has been with Mauna Kea for about six years, reported that a breakdown of the plant has never occurred during the time he has been working there. The wastewater treatment plant has experienced minor problems, but these have always been corrected within a short period. He confirmed that the plant has been designed with sufficient backup systems.

The likelihood of agricultural chemicals polluting the bay is also very remote. In a complete review of the literature on coral reef pollution, Richard W. Grigg and Steven J. Dollar found no documented examples of pesticide problems anywhere in the world. Furthermore, there has been no substantiated evidence of pesticide damage of coral reefs on the Kona coast or the Big Island as a whole. (Reference: Grigg, R. W. and S. J. Dollar. (in press). Natural and anthropogenic disturbance on coral reefs.)

3. **Viewplane.** A landscape concept plan will be presented in the Final EIS to show what existing vegetation will be retained. It is the developer's intent to retain specimen trees and some of the existing kiawe, trimmed.

4. **Hotel Height.** Increasing the building height to 75 feet allows the design of a hotel complex with a large amount of open space. If the structures were limited to 45 feet, the hotel would have to cover a much larger area to accommodate all of the planned guest rooms and facilities. With less open space and landscaping, the buildings' visual impact may possibly be even greater.

Additional illustrations will be presented in the Final EIS to show views of the hotel from various perspectives along the beach.

5. **Beach Club.** The Beach Club is intended to primarily serve the residents of the resort. It is a "beach club" and, hence, should be located close to the shoreline. The proposed facility will be a one-story structure designed to blend with the environment as much as possible.

6. **Recreational Resources.** A detailed discussion of the beach congestion issue is contained in the Draft EIS; please refer to pages V-129 to V-140. We have concluded that South Kohala resort and other planned developments in the region would likely increase beach usage at Hapuna. However, the degree to which South Kohala Resort would contribute to higher levels of beach use and a less satisfactory experience to current users of Hapuna is as yet unresolved.

Any attempt to predict future beach usage cannot be based on the assumption that things will remain "as is" with regard to the availability of recreational resources and facilities in West Hawaii. An intolerably congested Hapuna Beach is not an automatic "given"; government, the public, and the private sector have various options at their disposal to alleviate present and future overcrowding. The purpose of an environmental impact statement is to disclose the potential impacts and provide possible alternatives and mitigation measures. Several suggestions are offered in the South Kohala Resort Draft EIS, such as the expansion of the Hapuna Beach State Recreation Area to include Waialea Bay, as well as the development of other beach parks. DLNR's efforts to prepare an inventory and select sites for future parks are to be encouraged so that presently inaccessible beaches can be enjoyed by all. Furthermore, as new resorts are developed, they will be expected to provide shoreline access and facilities--thus opening up more beaches for public use.

Mr. Jerry Rothstein  
December 16, 1987  
Page 3

7. Alternatives to the Proposed Action. As much as possible, existing vegetation will be retained, and a landscape concept plan for the proposed hotel complex will be included in the Final EIS. In reply to your comments about vegetation, it should be pointed out that most of the vegetation at the site is not "natural"--either in the sense of being native or naturally occurring (i.e., not cultivated). Please refer to the section in the EIS on terrestrial flora (pages IV-30 and 31). A botanical survey of the area revealed that the vegetation is typical of dry leeward areas where kiawe (an introduced tree) and exotic weeds and grasses have replaced most native species. Moreover, quite a bit of the vegetation near the shoreline at the project site was planted by Olohana Corporation and is, thus, not "natural."

Your suggested alternative of constructing the proposed hotel on Kauna'oa Bay is not feasible for the following reasons:

- o The site you propose is not part of the project application.
- o The south end of Kauna'oa Bay, currently occupied by the golf course and other Mauna Kea Resort facilities, does not have enough space to accommodate the hotel, parking, tennis complex, and other amenities, as planned. The site lacks the 33 acres required for these facilities.
- o Even if there was sufficient space in that site, a hotel located there would not relate to the planned golf course and clubhouse, which are considered an integral part of the hotel complex.

The alternative of constructing the proposed hotel at a site between Kauna'oa and Hapuna Bays has also been rejected. "The Bluffs" parcel is no longer part of the South Kohala Resort project, but is rather part of the Mauna Kea Resort. Furthermore, the parcel is currently zoned for residential use and not resort use.

8. Incompatibility with SMA Guidelines. Your letter claims that development of the proposed resort would be incompatible with the County Special Management Area guidelines. Our response to each of your points is given below.

Guidelines A2 and A3. The development of South Kohala Resort will not reduce the availability and/or access to beaches and other recreational areas and shoreline areas. This issue is covered thoroughly in the Draft EIS, and mitigation measures are suggested to minimize the impression that resort guests are intruding on beach users, as well as reduce beach congestion. Existing public access to the shoreline will not be affected, and additional public parking and access through the resort will be provided.

Guidelines B1, B2, and B3. According to these guidelines, no development shall be approved unless it has no significant adverse environmental effects and is found consistent with applicable ordinances. The Draft EIS discloses that there would be significant impacts associated with the proposed project. Some may argue that certain impacts are *potentially* adverse, but in all cases, mitigation measures are suggested to offset each of these effects. Therefore, it can be concluded that South Kohala Resort will have no significant adverse environmental effects and will be compatible with the County SMA guidelines.

Mr. Jerry Rothstein  
December 16, 1987  
Page 4

9. Hapuna Beach Congestion. Please refer to item 6 above. In preparing the Draft EIS, an effort was made to estimate future use of Hapuna Beach by resort guests, residents, and employees and their families. Beach counts were conducted over a period of time at both Kauna'oa Beach, fronting the Westin Mauna Kea, and at Hapuna Beach. The Kauna'oa counts were taken to examine the pattern of resort guest usage, which is expected to be similar at the proposed South Kohala Resort. See pages V-131 to V-135 for the results of the beach counts.

From the beach counts taken at Kauna'oa, we can tentatively infer a daily average of anywhere from, say, 200 to 450 South Kohala Resort visitors using the beach. These numbers would increase at peak times when occupancy in both the hotel and resort/residential units is highest. (The latter refers to those multifamily units that provide transient accommodations.) We can get a rough idea of beach usage by resort residents by looking at the population projections in Chapter V of the Draft EIS. An on-site residential population of 424 is expected when all units are occupied. Additional off-site population (South Kohala Resort employees and their families who have moved to the area) is projected to be about 1,100. All we can assume at this time, given these figures, is that usage at Hapuna Beach will increase. Predicting the actual increase is not possible at this time. Likewise, we cannot predict the actual effect of cumulative resort development in the region on beach usage at Hapuna.

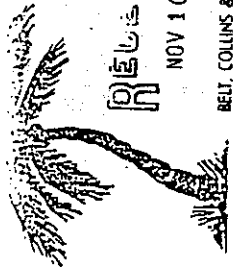
We would like to point out that the total resident and visitor population impacts projected in the Draft EIS refer to both new people and existing residents supported by new jobs, as well as visitors. Hence, the figure quoted in your letter (25,000+) needs to be examined in the proper context. In addition, your statement that "proposed major residential projects in North and South Kohala and North Kona comprise another 25,000 residential units" needs to be clarified. We assume that you are referring to the total number of units listed in Table V-25, Major Proposed Residential Projects in West Hawaii. This should be differentiated from the demand for new housing likely to be generated by South Kohala Resort and other planned developments in the region. It is projected that by 1998, islandwide housing impacts due to cumulative resort development would range from 2,900 to 3,200 new units, with a theoretical ultimate impact of 10,300 units.

Thank you for your cooperation. We trust that the issues raised in your letter have been adequately addressed.

Sincerely,

Anne L. Mapes

cc: Mr. William F. Mielicke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



Save Hawaii Save Hawaii Save Hawaii  
Hawaii Save Hawaii Hawaii Save Hawaii  
Save Hawaii Save Hawaii Save Hawaii

**SAVE HAWAII!**  
FOUNDATION

NOV 10 1987

"a voice for the environment"

BET. COLLINS & ASSOCIATES

To whom it concerns —

It is the opinion of Save Hawaii Foundation that a hotel anywhere near Hapuna Beach is not in the best interests of Hawaii's residents, visitors, future residents, or future visitors.

Hapuna Beach is the Big Island's most popular beach & recreational resource. Some people say it is the Big Island's "only" beach. While Hapuna is certainly not the only beach on the island, it is a fact that this island has only about one mile of sandy shoreline that is safe and accessible, out of a total coastline of about 300 miles! Already, Hapuna Beach is very crowded on weekends, and about (20) huge resorts are planned for west Hawaii. The visitors at these other resorts will also want to use Hapuna. The resident population is also increasing very rapidly, with predictions that the Big Island population will double in about 20 years, with most of the resident population increase in west Hawaii. While the population is growing, the beaches are not, and are gradually being lost to hotel + resort development. (Continued →)

**SAVE HAWAII!**

328-9482

陳偉倫

陳偉倫管理



Save Hawaii Save Hawaii Save Hawaii  
Hawaii Save Hawaii Hawaii Save Hawaii  
Save Hawaii Save Hawaii Save Hawaii

**SAVE HAWAII!**  
FOUNDATION

"a voice for the environment"

One researcher from the East-West Population Centre on Oahu predicts a Big Island population in the year 2050 of at least 750,000 (seven times today's population) and possibly as many as 3 million people on the Big Is. Another projection estimates that 100,000 homes will be built in the Waikoloa to Kawaihae "sunbelt" by the year 2025!

The fact that Hapuna Beach is a rare, precious resource should give planners second thoughts about allowing this huge resort so close to our island's most-used recreational resource. The hotel, in addition to about 1,000 single- and multi-family residences within the resort would bring thousands of people living within walking distance of Hapuna Beach. Studies of the beach use during a normal, crowded weekend day show that only about 500 people on the beach at one time can get crowded.

We're also concerned that the massive hotel will block the spectacular view of the Kohala mountains from the beach, a view that gives so many people a sense of peace and tranquility.

**SAVE HAWAII!**

328-9482

陳偉倫

陳偉倫管理

December 16, 1987  
87-2474

Mr. Robert Silverstein  
Save Hawaii Foundation  
Box 888  
Captain Cook, Hawaii 96704

Dear Mr. Silverstein:

South Kohala Resort Environmental Impact Statement (EIS)

We received your letter regarding the South Kohala Resort Draft EIS on November 10, 1987 and wish to respond to your comments.

1. Hapuna Beach Congestion. From your letter, it would seem that the congestion at Hapuna Beach is your primary concern. Related to this is concern about the growth of tourism and high population projections for the Big Island and West Hawaii in particular. A detailed discussion of the beach congestion issue is contained in the draft EIS; please refer to pages V-129 to V-140. We have concluded that South Kohala Resort and other planned developments in the region would likely increase beach usage at Hapuna. However, the degree to which South Kohala Resort would contribute to higher levels of beach use and a less satisfactory experience to current users of Hapuna is as yet unresolved.

We contend that an intolerably congested Hapuna Beach is not an automatic "given" -- that government, the public, and the private sector have various options at their disposal to alleviate present and prevent future overcrowding. The purpose of an environmental impact statement is to disclose the potential impacts and provide possible alternatives and mitigation measures. Several suggestions are offered in the South Kohala Resort EIS. For example, the developer is prepared to work with government and the public to upgrade and expand the Hapuna Beach State Recreation Area.

2. Shortage of Sandy Beaches. Another point raised in your letter is the relative shortage of safe, accessible sandy beaches on the Big Island, and hence, the need to preserve Hapuna. This shortage is recognized in the South Kohala Resort Draft EIS. For example, on page V-123, we recount the findings of a DLNR survey that Hawaii has the lowest ratio of park-related beaches to population of all counties in the state: 0.2 acres per 1,000 population, compared to a statewide average of 0.4 acres per 1,000. To help alleviate this shortage, as well as future beach congestion at Hapuna, we suggest on page V-140 of the EIS that more beach parks be developed. There are a number of beautiful, undeveloped white sand beaches in West Hawaii, but they are not accessible to the general public. DLNR's current efforts to prepare an inventory and select sites for future park development are to be encouraged so these beaches can be enjoyed by all.

Mr. Robert Silverstein  
December 16, 1987  
Page 2

It should be noted that many local residents value the calm waters off rocky shorelines just as much as the sandy beaches. West Hawaii is fortunate to have many miles of accessible shoreline featuring magnificent coral reef habitats (probably the best in the state), and conditions in these areas are ideal for fishing, snorkeling, and scuba diving.

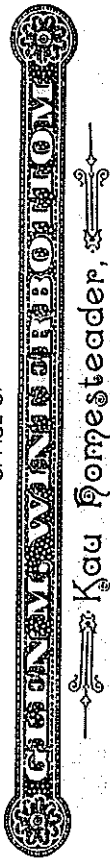
3. Visual Impact. With regard to your concern that the proposed hotel would block the view from the beach of the Kohala Mountains, we will be providing in the Final EIS photos showing the views of the hotel from different perspectives on the beach. However, from photos taken in front of the hotel site, it appears that a person on the beach looking directly mauka would not be able to see much of the Kohala Mountains due to the kiawe growth and elevated terrain. Even looking north, the mountains are barely visible over the treetops. Efforts will be made to confirm these visual impacts for the Final EIS.

Thank you for your cooperation. We hope that the issues raised in your letter have been adequately addressed.

Sincerely,

Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department



Following in the  
Footsteps of  
Henry David Thoreau,  
(1817-1862)

No. 27 Poha Street.  
Mailing Address:  
Post Office Box W.

*Mahealani Kuan, M. A.* November 8, 1987  
[98772] U.S. America

Ms. Anne L. Mapes  
Belt, Collins & Assoc.  
606 Coral Street  
Honolulu, Hawaii 96813

NOV 10 1987  
SELI, COLLINS & ASSOCIATES

COMMENTS ON THE DRAFT ENVIRONMENTAL  
IMPACT STATEMENT FOR THE SOUTH KOHALA RESORT

Dear Ms. Mapes:-

As a Big Island resident who occasionally visits Hapuna Beach and is interested in sound long-range planning for the Island of Hawaii, I would like to thank you for this opportunity to comment briefly on the Draft Environmental Impact Statement (DEIS) for the proposed South Kohala Resort.

I am a fourth-generation resident of the Hawaiian Islands, and my interest in proper planning may be attributed in part to growing up in the Waikiki area of Oahu and seeing it degenerate into its present "honky-tonk" status. I have heard many wonderful stories about the South Kohala region from my mother, Cordie Austin, who was a golfing student and frequent houseguest of the late Francis I'i Brown at Keawaiki in the 1930's. My older

*"The greatest fine art of the future will be the making of a comfortable*

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Ms. Anne L. Mapes  
November 8, 1987

brother was also a guest of Francis Brown at his Kohala estate in 1959.

Without beating around the bush, the developer's contentions in the subject DEIS that the planned resort's impact on state-owned Hapuna Beach would be minimal is contradicted by an acknowledgement on p. III-2 therein that:

Under this alternative, if the hotel site were to remain undeveloped, existing views from the beach would be preserved, and the possibility of "intrusion" impacts on Hapuna Beach would be eliminated (although congestion of Hapuna State Park may still become a problem, given other developments in the region).

Obviously, if development of other projects in the South Kohala area could cause overcrowding of the park, it is almost a certainty that a large resort complex located right on Hapuna Beach itself would contribute immensely towards congesting what in most resident's opinions is the finest white sand beach on the Big Island.

From personal observation, I can attest that weekend useage of Hapuna Beach, including the northern portion adjacent to the proposed hotel site, has already reached, if not exceeded, it's optimum capacity. While it may well be that the feeling of "overcrowding" is subjective in nature, I believe that most reasonable persons would feel crowded when the park's huge 225-stall parking lot is almost full and there is precious little open sand separating groups of beachgoers.

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I can recall special county excursion buses running from Hilo to Hapuna Beach in the mid-1970's, which substantiates the island-wide appeal of this particular recreation site.

According to Mayor Dante Carpenter's "Ola Na Moku" column (Hawaii Tribune-Herald, Nov. 2, 1987), "The employment and population of the Big Island is expected to double over the next 20 years, mainly because of the development of high quality resorts in North Kona and South Kohala and the resulting increase in tourism." A Hawaii Tribune-Herald news analysis ("Housing furor shows difference in island outlooks", May 24, 1987) stated:

"County housing officials forecast the overall population of West Hawaii will soar from 34,000 to 120,000 in the next 20 years..."

In the face of such estimates, allowing further "resorting" of this island's extremely limited inventory of undeveloped sandy beaches would go beyond the bounds of poor planning and enter the realm of utter foolishness.

If, as suggested by consulted party Jerry Rothstein, the sand portion of "Beach 69" at Wailea Bay is less than 10% of the size of Hapuna Beach, then the proposed state acquisition of this area to expand Hapuna State Park would do little to alleviate even present overcrowding of Hapuna Beach proper.

On the subject of alternatives, it appears from Figures 11-3 and 11-4 in the subject DEIS that the property owner currently controls sufficient coastal land north of Hapuna Bay to render construction of the planned hotel adjacent to Hapuna Beach abso-

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lutely unnecessary.

Locating the hotel midway between Hapuna and Kaunaoa Bays would provide it's patrons with ample proximity to the ocean, and these guests could be channeled northward to the already resort-dominated beach fronting the Mauna Kea Beach Hotel. Such a move would have little impact upon mauka development of the proposed resort, since the developer declares on p. V-135 of the DEIS that visitors and residents there "will be older and more likely to prefer non-beach-oriented recreational facilities available at the resort..."

The 32.69 acre parcel abutting Hapuna Beach (TMK 6-6-02:3) could then be utilized for golf fairways or other recreational amenities, or perhaps a land exchange and state appropriation of part of this area for a permanent buffer zone could be arranged to the property owner's satisfaction.

However, if the developer chooses to ignore the viable alternative of restructuring the proposed resort to alleviate likely "intrusion" impacts on the adjacent Hapuna Beach State Park, then I would heartily recommend that Special Management Area permission for the planned hotel be denied by the County Planning Commission; one less hotel along the Kona-Kohala coastline would hardly prove fatal to the Big Island's economy.

Thanking you for your kind consideration of the forego-



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Ms. Anne L. Mapes  
November 8, 1987

BELT COLLINS  
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Hawaii • Singapore • Australia • Hong Kong

ing remarks and suggestions, I remain

Yours Respectfully,

*Glen M. Winterbottom*  
GLEN M. WINTERBOTTOM

*A word or two about tourism because of its obvious importance. Resisting tourism per se is foolish. Instead, we should decide to shape our tourism and not be content, through passiveness, to let our tourism willy-nilly shape us.*  
George Chaplin, Hon. Advertiser Editor,  
1967

December 16, 1987  
87-2475

Mr. Glen M. Winterbottom  
P. O. Box W  
Naalehu, Hawaii 96772

Dear Mr. Winterbottom:

South Kohala Resort Environmental Impact Statement (EIS)

Thank you for your letter of November 8, 1987, commenting on the Draft EIS for South Kohala Resort. We are writing to respond to the major points that you raised.

1. **Hapuna Beach Congestion.** We understand that the congestion at Hapuna Beach is your primary concern. Related to this is concern about the growth of tourism and high population projections for the Big Island and West Hawaii in particular. A detailed discussion of the beach congestion issue is contained in the draft EIS; please refer to pages Y-129 to Y-140. We have concluded that South Kohala Resort and other planned developments in the region would likely increase beach usage at Hapuna. However, the degree to which South Kohala Resort would contribute to higher levels of beach use and a less satisfactory experience to current users of Hapuna is as yet unresolved.

We contend that an intolerably congested Hapuna Beach is not an automatic "given" -- that government, the public, and the private sector have various options at their disposal to alleviate present and prevent future overcrowding. The purpose of an environmental impact statement is to disclose the potential impacts and provide possible alternatives and mitigation measures. Several suggestions are offered in the South Kohala Resort EIS. For example, the developer is prepared to work with government and the public to upgrade and expand the Hapuna Beach State Recreation Area.

2. **Waialea Bay.** We have checked the Soil Conservation Services's *Soil Survey of the Island of Hawaii* and the Hapuna Beach State Park master plan prepared by Charles Yoon and Associates to verify the length of the beach at Waialea. Examination of maps in these sources confirm that the beach is about 1,400 feet long.

3. **Alternate Hotel Site.** The possibility of constructing the proposed hotel on the rocky shoreline between Hapuna and Kaunāoa Bays was not considered because it is not an alternative "which could feasibly attain the objectives of the action" (Section 11-200-17(f) of Title 11, DOH Chapter 200 EIS Rules). As stated in the Draft EIS, the objective is to develop an economically viable luxury resort community on oceanfront property adjacent to Hapuna Bay. One of the special features most sought for in a luxury resort in Hawaii is close proximity to a sandy beach suitable for swimming. This feature is required to give South Kohala Resort a competitive edge

Mr. Glen M. Winterbottom  
December 16, 1987  
Page 2

in attracting clientele. Another reason why the site you have proposed was not included as an alternative is because of the significant visual impacts. As the resort is currently planned, the hotel would be set back and its visual impact from the southern portion of Hapuna Beach minimized. A hotel located on the elevated rocky shoreline between Hapuna and Kauna'oa Bays would be much more visible from both the park and the main highway, and the view of the ocean from lands mauka of the hotel would be blocked.

Furthermore, the alternate site is no longer part of the South Kohala Resort project; it is now part of Mauna Kea Resort development. Also, it is currently zoned for residential use and not resort use.

Thank you for your cooperation. We hope that the issues raised in your letter have been adequately addressed.

Sincerely,

  
Anne L. Mapes

cc: Mr. William F. Mielcke, Mauna Kea Properties, Inc.  
Mr. A. Lono Lyman, Hawaii County Planning Department

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## **APPENDICES**

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*Ming Chew Associates*

*Consulting Real Estate Economists*

May 19, 1987

**Market Analysis  
for  
Proposed South Kohala Resort**

**District of South Kohala, County of Hawaii  
State of Hawaii**

Mr. William F. Mielcke  
Vice President and Project Director  
Mauna Kea Properties, Inc.  
P. O. Box 218  
Kamuela, Hawaii 96743

Dear Mr. Mielcke:

We are pleased to transmit the results of our updated Market Analysis for the proposed South Kohala Resort, located adjacent to the southern boundary and to the east of the Mauna Kea Resort, District of South Kohala, County of Hawaii, State of Hawaii. The project would include a resort hotel, beach and tennis club, an 18-hole golf championship course and resort residential uses.

Our conclusions are summarized in Chapter I. The research and analyses upon which they are based appear in the body of the report.

Briefly, our analysis indicates that the planned golf course should be in operation by the time the resort hotel opens. The analysis also indicates that market demands by 1990 could absorb about three-fourths of the total units recommended for development in the South Kohala Resort, and by 1995, could accommodate all of the recommended units.

We appreciate the opportunity to work with you on this very interesting and challenging assignment, and look forward to assisting further, as requested.

Prepared for  
Mauna Kea Properties, Inc.  
Mauna Kea Resort, Island of Hawaii

Very sincerely,

May 1987

MING CHEW ASSOCIATES

J. Ming Chew

JMC:j

*Ming Chew Associates*  
*Consulting Real Estate Economists*

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I. ASSIGNMENT AND SUMMARY

A. Assignment

Our assignment has been to prepare an updated market analysis for the proposed South Kohala Resort, to be developed adjacent to Mauna Kea Resort in the District of South Kohala, County of Hawaii (Island of Hawaii), State of Hawaii. The results of this analysis are to be used in preparing an Environmental Impact Statement (EIS) for the proposed project.

B. Approach

Our approach has been to identify the primary markets that could be served by the entire resort. General economic trends were assessed, and projections made of likely visitor arrivals for the State and County. These projections in turn were converted into demand estimates for total transient accommodations, hotel rooms, resort multifamily units (units in resort multi-family projects), resort subdivision houselots and the proposed 18-hole championship golf course.

The demand estimates were compared with existing and planned supply to formulate marketability conclusions for the proposed South Kohala Resort.

C. Summary of Findings and Conclusions

1. The entire Kohala Coast Resort Region has been designated by the State of Hawaii and County of Hawaii in their various plans as a major resort region. Excellent climate, white sand beaches, accessibility and the present concentration of high-amenity, masterplanned, controlled-environment luxury and super-luxury resorts, combine to make Kohala Coast potentially the highest-quality resort region in the State.
2. The proposed South Kohala Resort would be similar in concept and quality to its world famous neighbor, Mauna Kea Resort. The Resort would include a luxury resort hotel, beach and tennis club, championship golf course, and resort residential projects.

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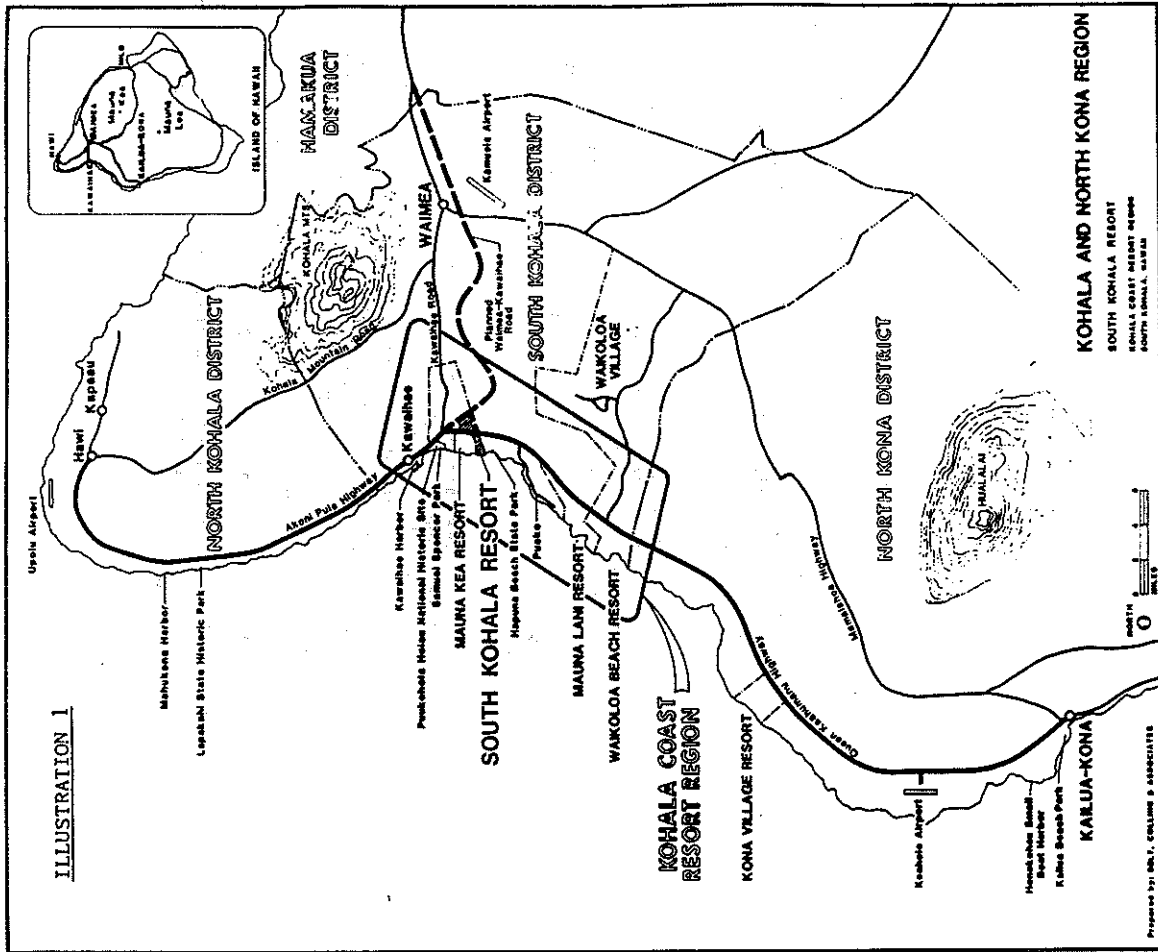
Qualifications of the Consultant and the Firm

3. After two flat years for Hawaii's visitor industry in 1980 and 1981, the number of visitor arrivals to the State has rebounded, and increased almost 15 percent in 1986.
4. The County of Hawaii visitor industry as a share of state-wide activity declined from 1971 to 1986. On the other hand, the estimated number of westbound visitors to the Island, the primary source of the County's visitor industry patronage, has reversed its decline from the recent low reached in 1981.
5. Despite the County-wide trends, visitor industry activity on the Kohala Coast has been spirited. Since 1981, two high-amenity resorts opened championship golf courses and luxury or super-luxury hotels. As a result, in 1983, the number of transient accommodation units in North and South Kohala exceeded the number in Hilo for the first time. Also from 1983 to 1986, North and South Kohala's share of the Island's occupied units has been about twice the estimated 11 percent recorded in 1980.
5. Continued development of high-quality resort amenities and accommodations, direct flights from the U.S. Mainland west coast to Ke-ahole Airport by United Airlines, cooperative advertising for the Kohala Coast Resort Region between the existing resorts and United Airlines (the largest carrier of westbound visitors to Hawaii), programs to promote neighbor island destinations by Japan Air Lines (the largest carrier of eastbound visitors to Hawaii) and increased promotions and marketing efforts by the new facilities on the Kohala Coast are expected to expand basic demand to the Region.
7. We estimate that net new demand for transient accommodations in North and South Kohala in excess of the 1987 inventory would be 2,200 units by 1990, 4,500 by 1995 and 6,500 by 2000.
8. Projected net new demand for super-luxury hotel units in the proposed South Kohala Resort would be 300 by 1990, 500 by 1995 and 600 by 2000. The hotel could have published daily rates in excess of \$200 if requisite amenities and service are provided.
9. Estimated net new demand for low-rise resort multi-family units in the proposed South Kohala Resort would be 300 units in 1990, 800 in 1995 and 1,400 in 2000. Achievable average prices for the mauka units would be \$500,000 to \$600,000, fee simple.
10. Net new resort subdivision house/lot demand in South Kohala Resort is projected to be 30 lots in 1990, 80 in 1995 and 140 in 2000. Achievable fee simple prices are estimated to be \$300,000 to \$350,000 for lots in the High Bluffs and \$175,000 to \$225,000 for the mauka lots.
11. Demands, numerically equivalent to the house/lot projections, are projected to exist for detached house and lot packages in the proposed resort. This would be 30 homes in 1990, 80 in 1995 and 140 in 2000. Projected average prices for the fee simple house and lot packages would be from \$800,000 to \$1,200,000 in the High Bluffs, and from \$600,000 to \$800,000 in the mauka portion of the Resort.
12. The net new demand for golfing activity in the proposed South Kohala Resort is projected to be about 38,000 to 43,000 annual rounds in 1990. Since this amount of play is not likely to be accommodated by other courses in the region, an associated 18-hole high-quality championship golf course within the proposed resort would be needed by the time the proposed beach hotel begins operations. By 1995, we estimate that the demand for golf would reach 72,000 annual rounds, and reach 128,000 rounds by 2000.
13. Table I-1 summarizes the number of units and level of activity recommended, and our projected marketability of the proposed South Kohala Resort.

Table I-1  
**PROJECTED MARKETABILITY**  
**PROPOSED SOUTH KOHALA RESORT**  
 Kohala Coast Resort Region  
 County of Hawaii, State of Hawaii

|                                   | Recommended   | Projected Marketability |               |                |
|-----------------------------------|---------------|-------------------------|---------------|----------------|
|                                   |               | 1990                    | 1995          | 2000           |
| <b>HOTEL ROOMS</b>                | 350           | 300                     | 500           | 600            |
| <b>LOW-RISE MULTIFAMILY UNITS</b> |               |                         |               |                |
| Mauka                             | 450           | 300                     | 800           | 1,400          |
| <b>HOUSELOTS</b>                  |               |                         |               |                |
| Makai                             | -             | 5                       | 5             | 5              |
| Lot                               | -             | 5                       | 5             | 5              |
| House and Lot                     | -             | 10                      | 10            | 10             |
| Subtotal                          | 100           | 25                      | 75            | 135            |
| Mauka                             | -             | 25                      | 75            | 135            |
| Lot                               | -             | 50                      | 150           | 270            |
| House and Lot                     | 100           | 60                      | 160           | 280            |
| Subtotal                          | 110           | 60                      | 160           | 280            |
| <b>Total</b>                      | <b>900</b>    | <b>660</b>              | <b>1,460</b>  | <b>2,280</b>   |
| <b>TOTAL (ROOMS/UNITS/LOTS)</b>   | <b>900</b>    | <b>660</b>              | <b>1,460</b>  | <b>2,280</b>   |
| <b>GOLF ROUNDS, ANNUAL</b>        | <b>45,000</b> | <b>38,000</b>           | <b>72,000</b> | <b>128,000</b> |

SOURCE: Ming Chew Associates



## II. DESCRIPTION OF THE REGION

The entire Kohala Coast Resort Region, which is situated along the coast of the District of South Kohala, has been designated by the State of Hawaii and County of Hawaii in their various plans as a major resort region. The region contains three very high quality masterplanned resorts. The Mauna Kea Resort (Mauna Kea beach hotel and golf course) began operations in 1965. Waikoloa Beach Resort and Mauna Lani Resort began operations more recently. Golf courses in these two resorts and the Sheraton Royal Waikoloa started operations in 1981, and the Mauna Lani Bay Hotel opened in 1983. The approximately 1,250-room Hyatt Regency Waikoloa in the Waikoloa Beach Resort is under construction, and scheduled to be completed in late 1988.

The location of these resorts relative to the subject property are shown on the facing map.

The State of Hawaii consists of eight major and 124 minor islands having a total land area of approximately 6,425 square miles. Hawaii County (Island of Hawaii) has an area of approximately 4,038 square miles, and contains 62.8 percent of the State's total land area. Hawaii County comprises nine judicial districts: North and South Kohala, North and South Kona, Hamakua, Ka'u, Puna and North and South Hilo. The magnitude of this island, and the wide range of topography and climate, offer an environment more diverse than that of any of the other islands within the State.

The District of South Kohala is located on the northwest coast of the Island of Hawaii and includes topography ranging from white sand beaches to the Kohala Mountains and a portion of Mount Mauna Kea's lower leeward slope. The District of South Kohala has two distinct physical environments: the Waimea highland, which is characterized by green rolling hills used for diversified agriculture, and the coastal area from Kawaihae to Anaehoomalu Bay which consists of an arid plain of large lava flows, sharply contrasting with white sand beaches and bright aquamarine bays.

Over a ten-year period from 1960 to 1970, the population of the South Kohala District increased by 50 percent to 2,310, and represented the largest rate of population change of any district in the County. By 1980, the population had doubled to 4,607, and by 1985 had increased further to about 6,300. The basic population and commercial center within the South Kohala District is Waimea where a variety of small businesses cater mainly to local farming and ranching, and serve the local population.

The primary industries within this area are cattle ranching, diversified agriculture and tourism. More recently in Waimea, a small international scientific community has formed to support the numerous astronomy observatories on Mount Mauna Kea, and educational activities centered around Hawaii Preparatory Academy are expanding.

Although the upper plains are best suited for intensive cultivation and grazing, the makai or coastal plains are too dry and barren for agriculture use. The coastal plain is, however, an excellent area for resort development with year-round sunny climate (the average of nine inches of rainfall make the Kohala Coast the sunniest, driest and warmest region in the State), white sand beaches and clear, safe swimming water. This combination of features is recognized as an absolute requisite for successful resort development in Hawaii.

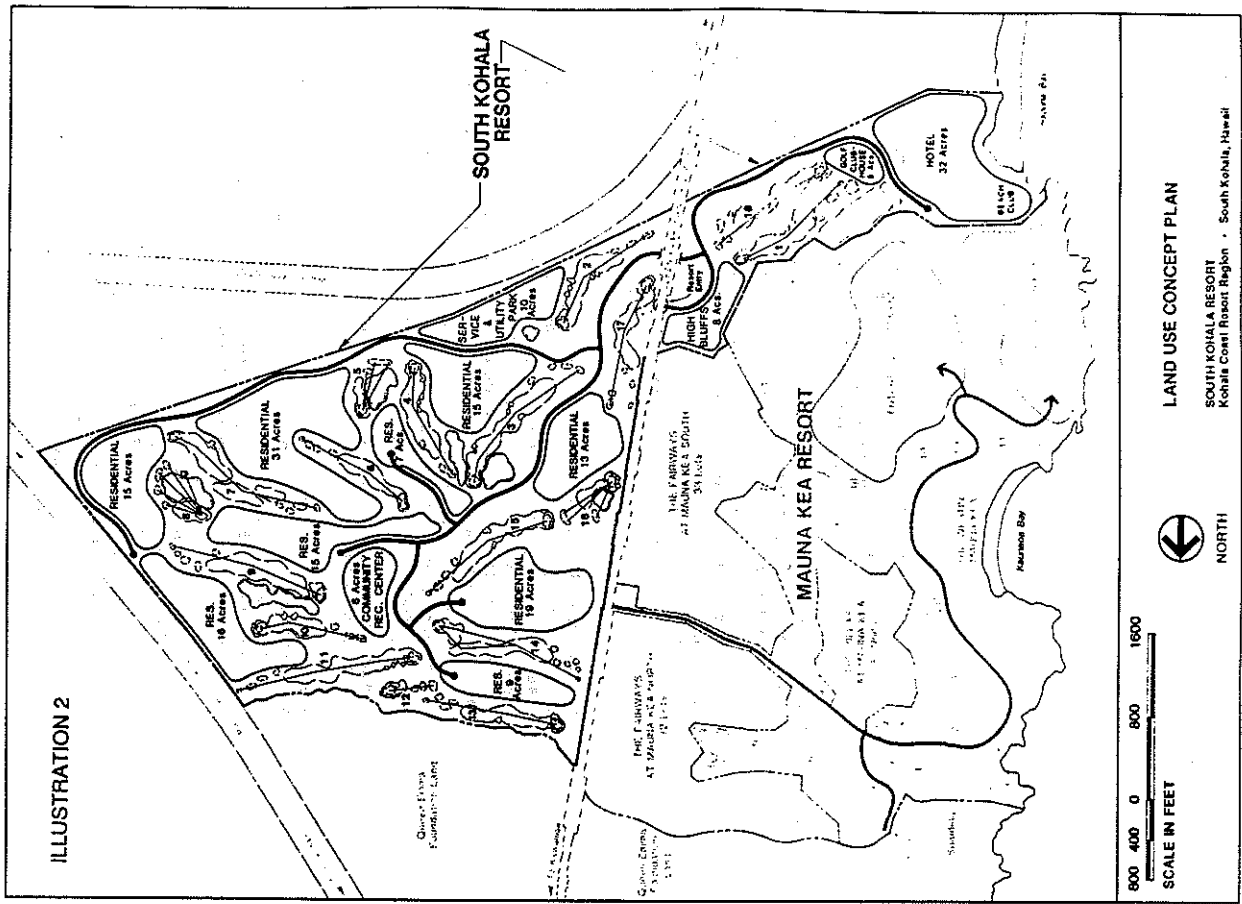
Access to the District is mainly by the Queen Kaahumanu Highway which opened in 1975 and connects Kailua-Kona with Kawaihae (the only deep water harbor in West Hawaii County). The high-speed road which extends 33 miles was completed at a cost of \$16 million. This coastal highway, part of the Island's Belt Highway System, vastly increases accessibility to the South Kohala District from Ke-ahole Airport, the major airport for West Hawaii County. This unique oper-air terminal, located about 20 miles south of the subject property, began operations in July 1970. In September 1983, it began handling direct flights by United Airlines from the U.S. Mainland west coast.

The Waimea-Kohala Airport, at an elevation of 2,700 feet, is the highest airport in the State. This air terminal handles only a limited number of scheduled charter flights and private aircraft. Princeville Airways serves Maikoloa using an airstrip near Waikoloa Beach Resort.

Kawaihae Harbor, which is located just a few miles north, is the second deep water port on the Island. This marine facility, completed in 1959, serves industrial, recreational and commercial sport fishing activities. Industries supporting this harbor are grain elevator and storage silos, oil tanks and a freight warehouse. A boat marina is part of this harbor complex.

A wide range of natural and man-made recreational diversions and scenic attractions are located throughout the South Kohala District. The white sand beaches situated on the arid, leeward shore are popular throughout the State.





The two major public recreation areas are Hapuna Beach State Recreation Area and the Samuel M. Spencer Beach Park. Hapuna is 65 acres in size, and is the major water-oriented recreation area in the County with an exceptionally attractive and wide white sand beach. Spencer Park, near Kawaihae Harbor, has an area of approximately 13 acres and a smaller sandy beach. Both of these recreation facilities permit surfing, swimming, picnicking, skin diving, limited camping and boating. In addition to these major areas, several other beach areas are available including the Anaehoomalu Bay at the Waikoloa Beach Resort and Puako Beach.

Other major recreational activities or sports include wild game hunting including pheasant, wild boar and Bighorn sheep. Deep sea fishing along the Kona and Kohala coasts produce world records for marlin and tuna. Horseback riding and hiking are two other activities offered in this area. Annual rodeos are held at Waikoloa Village, and skeet and trap range opened recently nearby. Polo is played at Waikii Ranch.

The U.S. National Park Service established the Puukohola Heiau National Historic Site as the third National Park facility on the island, and as only the fourth National Park facility in the State. This site contains two major heiaus near Kawaihae and also an historic house previously used by John Young, who was made a full chief by King Kamehameha, and who was governor of the Island of Hawaii from 1802 to 1812.

All of the resorts on the Kohala Coast have begun major marketing efforts. Some promotional activities have been coordinated with matching funds from United Airlines (the largest carrier of westbound visitors to Hawaii). In addition, Japan Air Lines (the largest carrier of eastbound visitors to Hawaii) has begun programs to promote neighbor island destinations. As a result, the promotional efforts for the Resort Region, which previously had been limited to the efforts of the Mauna Kea Resort, will be greatly expanded.

Moreover, the availability of alternative and complementary facilities should, in turn, result in greater "cumulative attraction" for the entire region. Expanded tourism activity in the region will increase the exposure of all existing resorts, as well as the subject proposed resort.

### III. DESCRIPTION OF THE PROJECT

South Kohala Resort is a proposed 500-acre resort complex to be developed by Mauna Kea Properties, Inc., a wholly-owned subsidiary of Allegis Corp. (formerly UAL, Inc.), on the Kohala Coast of the Big Island of Hawaii. It would be similar in concept and quality to the world famous Mauna Kea Resort and its Westin Mauna Kea (formerly the Mauna Kea Beach Hotel). South Kohala Resort will include a resort hotel, beach and tennis club, championship golf course, and resort residential uses. The facing illustration shows the Land Use Concept Plan.

#### A. Background

The South Kohala Coast Resort Region has long been envisioned by the State of Hawaii and the County of Hawaii as a major resort destination area. In 1965, the Westin Mauna Kea opened with 154 rooms. By 1973, the hotel had reached its present size of 310 rooms. In 1978, UAL, Inc., through its subsidiary Mauna Kea Land Corp., purchased the Mauna Kea Beach Hotel, golf course, and The Fairways at Mauna Kea South from Olohana Corp. (Laurance S. Rockefeller). A year later, the remaining Olohana Corp. fee, leasehold, and development agreement holdings in South Kohala were acquired. More recently, the leased fee interests have been acquired from the Parker Ranch (Richard P. Smart Revocable Personal Trust).

Mauna Kea Properties, the successor in interest to Mauna Kea Land Corp., continues to manage and operate the complex as a world class resort. In 1982, The Fairways at Mauna Kea North, a 32 unit, resort single-family house/lot subdivision, was completed. The Villas at Mauna Kea, a 40-unit luxury resort residential development, was completed in 1985. Mauna Kea Properties also has proposed construction of The Estates at Mauna Kea, featuring 27 to 30 homes slightly larger than those in The Villas project. The Mauna Kea Resort is the lowest density high-quality resort project in Hawaii.

#### B. South Kohala Resort

Present plans anticipate commencement of detailed design of the South Kohala Resort complex in the near future. The focal point of this new resort will be a luxury hotel south of the Westin Mauna Kea and just north of Hapuna Beach State Park. The number of rooms in the

hotel is projected to be 350. The entire resort will be a unique, low-density world-class destination resort, similar to the Mauna Kea Resort and with comparable amenities and services.

Prior to opening of the new hotel, a challenging 18-hole championship golf course and clubhouse will be built. This course will originate and end at the hotel and will have attractive views of the Kohala Coast. Most of the golf course will be situated on the higher elevation lands mauka of the Queen Kaahumanu Highway. The course will be connected by a highway underpass.

The mauka portion of the resort would include the resort hotel, clubhouse, driving range, two holes of golf, a beach and tennis club and The High Bluffs low-density resort residential project. Current plans envision 10 low-density detached resort residential units in The High Bluffs project.

The mauka portion is planned for resort single-family and multifamily units, 16 holes of the golf course, a recreation center and a halfway station for the golf course. Plans for the mauka portion envision a total of about 550 resort residential units.

Residential properties would be sold in fee simple ownership.

#### C. State Land Use District

The Resort will occupy approximately 500 acres of land. The 100 acres mauka of the highway and the mauka 400 acres are presently classified Urban. In 1985, the State Land Use Commission approved incremental reclassification of the mauka lands. Phase I, encompassing about 317 acres, are now in the Urban district. Upon compliance with conditions imposed by the Commission, the remaining mauka lands would be reclassified from Agriculture district to Urban district.

#### D. County General Plan and Zoning

The proposed South Kohala Resort development substantially conforms to the County General Plan and the General Plan Land Use Pattern Allocation Guide (LUPAG) map. The lands have received the proper zoning designations to carry out the proposed development concept.

IV. STATE OF HAWAII TOURISM

A. Visitor Count

From 1950 to 1970, the number of visitors to the State of Hawaii staying overnight or longer increased at a compounded rate of 20 percent per year. The rate of increase slowed to 9.5 percent per year from 1970 to 1979. Activity was essentially flat for 1980 and 1981 and then increased an average of 7.3 percent per year from 1982 through 1984. Arrivals were essentially unchanged for 1985. However, visitor arrivals increased from 4,884,110 in 1985 to an estimated 5,606,980 in 1986, a gain of 14.8 percent. Numerically, this is the largest year-to-year increase ever experienced by the State. These trends are shown in Table IV-1.

B. Visitor Expenditures

Visitor expenditures are estimated to be the largest source of income to the State, contributing about one-third of the State product. Visitor expenditures have increased from about \$595,000,000 in 1970 to an estimated \$5,550,000,000 in 1986.

C. Inventory of Visitor Accommodations

About 90 percent of the visitors to Hawaii staying overnight or longer have been accommodated in hotels, apartment-hotels or condominium apartments rented on a short-term basis.

Most of the State's 65,318 visitor accommodation units are located in Waikiki, on the island of Oahu. This resort district is considered to be the major gateway for the visitor industry in the State.

However, since the early 1960's, the visitor industry has expanded faster outside of Waikiki than within. In February 1970, 62 percent of the State's transient accommodations were located in Waikiki. By February 1987, the share had dropped to 52 percent. Over this period of time, only 45 percent of the new inventory was added inside Waikiki, and most of the new inventory has been added on the neighbor islands.

Table IV-1  
VISITOR TRENDS  
State of Hawaii  
1950 - 1986

| Year | Overnight and Longer Visitors | Annual Percentage Increase | Westbound Visitors | Eastbound Visitors |
|------|-------------------------------|----------------------------|--------------------|--------------------|
| 1950 | 46,583                        | --                         | N.A.               | N.A.               |
| 1960 | 296,517                       | --                         | 250,795            | 45,722             |
| 1970 | 1,746,970                     | 14.4                       | 1,326,135          | 420,835            |
| 1971 | 1,818,944                     | 4.1                        | 1,430,325          | 388,619            |
| 1972 | 2,244,377                     | 23.4                       | 1,782,737          | 461,640            |
| 1973 | 2,630,952                     | 17.2                       | 2,067,861          | 563,091            |
| 1974 | 2,786,489                     | 5.9                        | 2,184,620          | 601,869            |
| 1975 | 2,829,105                     | 1.5                        | 2,207,417          | 621,688            |
| 1976 | 3,220,151                     | 13.8                       | 2,551,601          | 688,550            |
| 1977 | 3,433,667                     | 6.6                        | 2,763,312          | 670,355            |
| 1978 | 3,670,309                     | 6.9                        | 3,030,999          | 639,310            |
| 1979 | 3,960,531                     | 7.9                        | 3,139,455          | 821,076            |
| 1980 | 3,934,504                     | (0.7)                      | 3,046,132          | 888,372            |
| 1981 | 3,934,623                     | 0.0                        | 2,974,791          | 959,832            |
| 1982 | 4,242,925                     | 7.8                        | 3,278,525          | 964,400            |
| 1983 | 4,367,880                     | 2.9                        | 3,395,880          | 972,000            |
| 1984 | 4,855,580                     | 11.2                       | 3,721,380          | 1,134,200          |
| 1985 | 4,884,110                     | 0.6                        | 3,708,610          | 1,175,500          |
| 1986 | 5,606,980                     | 14.8                       | 4,256,390          | 1,350,590          |

N.A. - Not Available

SOURCE: Hawaii Visitors Bureau, Annual Research Report.

Table IV-2 PERCENTAGE OCCUPANCY OF HOTEL ROOMS  
State of Hawaii by Island  
1970 - 1986

| Year | Maikiki/Oahu | Hawaii | Kauai | Maui |
|------|--------------|--------|-------|------|
| 1970 | 74.1         | 68.3   | 58.0  | 66.7 |
| 1971 | 58.9         | 63.5   | 57.9  | 70.1 |
| 1972 | 70.0         | 61.9   | 67.7  | 70.6 |
| 1973 | 81.5         | 62.3   | 75.9  | 76.5 |
| 1974 | 82.0         | 61.2   | 78.1  | 74.6 |
| 1975 | 78.3         | 59.9   | 77.2  | 72.3 |
| 1976 | 82.6         | 57.6   | 76.8  | 74.8 |
| 1977 | 81.2         | 61.0   | 80.6  | 76.9 |
| 1978 | 82.1         | 65.0   | 83.3  | 80.4 |
| 1979 | 77.1         | 62.0   | 76.5  | 73.0 |
| 1980 | 71.7         | 52.7   | 69.0  | 66.2 |
| 1981 | 73.9         | 44.9   | 62.7  | 70.3 |
| 1982 | 77.7         | 44.0   | 57.5  | 73.9 |
| 1983 | 76.6         | 44.7   | 57.2  | 75.2 |
| 1984 | 82.6         | 55.6   | 63.0  | 80.5 |
| 1985 | 80.8         | 57.6   | 64.8  | 78.5 |
| 1986 | 85.7         | 62.9   | 77.6  | 81.5 |

Recent additions to the statewide inventory in 1985 include the 56-unit Seaside Surf all-suite hotel in Waikiki and the 300-room Sheraton Princeville in the Princeville Resort on Kauai. The 350-room Kauai Hilton at Hanamaulu was completed in early 1986, and the 300-room Maui Prince was completed in the latter part of the year.

Construction currently is underway on the 1,250-room Hyatt Regency Waikoloa in the Waikoloa Beach Resort, the 750-room Westin Maui (previously the 550-room Maui Surf) in Kaanapali and the 850-room Westin Kauai (previously the 550-room Kauai Surf) on Kauai. Also on Kauai, construction of the 200-unit Hanalei Plantation overlooking Hanalei Bay has proceeded intermittently. In Waikiki, construction has begun on the 300-room expansion of the Halekulani and the approximately 600-room Waikiki Prince which will overlook the Waikiki yacht harbor. In late 1986, ground was broken for the 415-room Embassy Suite Maui just north of Kaanapali on Maui, and 37 units are being added to the Hotel Hana Maui.

D. Occupancy and Room Rate Trends

The occupancy rate of Hawaii's transient accommodations is a key indication of market conditions. That is, the occupancy rate provides a measure of the market relationships between demand and supply. Table IV-2 shows how occupancies have vacillated from 1970 through 1986 among the visitor plants on each island. The variability indicates differing conditions for the many resort districts.

Most districts experienced soft market conditions about 1971, as large amounts of inventory were added compared to smaller increases in visitor arrivals. As visitor activity increased, relative to new supply, occupancies increased through about 1978. Market conditions softened from 1980 to about 1982. By 1986, occupancies had rebounded to earlier levels and had reached new highs for Oahu and Maui.

As seen in Table VI-3, average room rates in Hawaii have increased continually since 1972 despite fluctuations in occupancies. This probably reflects inflationary effects as well as increasing quality of the transient accommodations. In 1986, average occupancy in the State reached a new high. Concurrently, the average daily room rate increased 6 percent.

SOURCE: Hawaii Visitors Bureau, Annual Research Reports, 1970-1980; Pannell Kerr Forster, 1981-1986.

Table IV-3

HOTEL OCCUPANCY AND  
AVERAGE DAILY ROOM RATES  
State of Hawaii  
1972 - 1986

| Year | Occupancy (%) | Average Daily Room Rate |
|------|---------------|-------------------------|
| 1972 | 70.2          | \$ 19.80                |
| 1973 | 78.1          | 21.56                   |
| 1974 | 78.4          | 24.12                   |
| 1975 | 75.2          | 27.43                   |
| 1976 | 76.8          | 29.52                   |
| 1977 | 76.7          | 34.28                   |
| 1978 | 80.6          | 38.49                   |
| 1979 | 73.7          | 44.41                   |
| 1980 | 67.8          | 47.28                   |
| 1981 | 68.2          | 49.73                   |
| 1982 | 70.4          | 51.78                   |
| 1983 | 69.7          | 54.78                   |
| 1984 | 76.0          | 59.25                   |
| 1985 | 76.1          | 68.84                   |
| 1986 | 81.7          | 73.20                   |

## E. Selected Visitor Characteristics

From 1970 through 1986, many characteristics of westbound visitors destined to Hawaii have changed, even after excluding the effects of the Military Rest and Recuperation (R&R) program. For example, after increasing to 47 percent during the mid-1970's, the percentage of persons traveling on organized tours in 1986 decreased to 15 percent, the lowest level since the mid-1960's; party size has increased continually and in 1986 reached 1.84 persons; median age declined to where it is about 40 years; a smaller share stayed less than seven and a larger share stayed 7-12 days, but the average stay has changed very little; and pleasure travel appears to be increasing.

The share of westbound visitor arrivals from the U.S. Mainland dropped from 98.1 percent in 1970 to 86.7 percent in 1982, but rebounded to 91.6 percent in 1986.

The percentage of first time visitors dropped from 67.2 percent in 1970 to 49.6 percent in 1983, marking the first year in which first-time visitors represented less than half of the westbound visitors. By 1986, the percentage of first-time visitors had again risen above the one-half mark, reaching 50.8 percent.

The proportion of visitors whose occupations were professional, technical, business, managerial and officials has increased, as has the proportion of retirees.

A significant change has also occurred in the type of accommodations being used. In 1986, 32.9 percent of respondents indicated they intended to stay in a "Condominium" or "Hotel and Condominium", up from 0.8 percent in 1970 who indicated they intended to stay in a "Rented Home or Apartment". The percentage staying in all other categories of accommodations dropped, including those staying with friends and relatives.

Finally, the median family income of visitors has shown consistent increases over the years, in part reflecting inflationary effects. The estimated median family income of visitors in 1983, the latest year available, was \$41,000, more than double the \$18,300 estimated for 1970.

SOURCE: Pannell Kerr Forster

#### F. Hawaii Visitor Industry Forecast

It is difficult to forecast trends and economic activities which grow at the startling rates experienced by the Hawaii visitor industry until 1979, and then declined for two years before increasing again. There are, however, several factors which appear significant regarding past growth, and likely to influence future prospects, including:

1. Economic growth on the U.S. Mainland.
2. High employment levels, resulting in high levels of disposable income.
3. Overall population growth.
4. General increases in vacation and leisure time.
5. Economic expansion in the Far East.
6. Greater interest and long distance travel.
7. Gains in transportation technology.
8. Greater fare competition.

During the 1960's, all of these factors favored long distance travel, and Hawaii benefited from these trends.

However, in the 1970's, economic conditions became more cyclical. Sharp increases in crude oil prices contributed to high inflation rates as well as the cost of long distance travel. As a result, the trend of visitor arrivals in Hawaii became more variable, and in 1980 and 1981 actually declined slightly.

This slowdown in visitor arrivals generated several responses. A major promotional program was initiated, and the State Government approved a supplemental appropriation of about \$1,000,000 for increased industry promotion and advertising. The marketing efforts of the Hawaii Visitors Bureau (HVB) increased. All of these factors helped boost the number of overnight visitors to the State eight percent for 1982 over 1981, and another three percent in 1983. In 1984, there was an 11.2 percent increase, the first double digit rise since 1976. Although the gain in visitor arrivals was very small in 1985, the HVB reports a gain of 14.8 percent in 1986.

In December 1984, the Governor's Tourism Congress convened to raise and discuss tourism-related issues, and to propose actions to be taken by both the public and private sectors. The Congress expanded the awareness of the important economic role that tourism plays in Hawaii, the implications of world-wide competition for visitor expenditures and the need for Hawaii to increase its funding for tourism promotion and marketing. One of the propositions submitted to the Congress for voting, and approved by 84 percent of the delegates, called for the Legislature to increase State funding for tourism promotion to between \$10,000,000 and \$20,000,000 per year. This compares with the historical HVB advertising budget of about \$400,000 per year. Also, 96 percent of the delegates supported attracting long-staying and higher-spending visitors. And, 60 percent of the delegates supported a proposition to raise about \$20,000,000 annually for a Tourism Promotion and Protective Fund by increasing the State General Excise Tax and then refunding a portion to state residents so that the tax increase would be incurred by visitors. Finally, 82 percent of the delegates agreed that future growth of tourism should be proportionally greater on the neighbor islands than on Oahu.

In 1986, the State Legislature and Administration responded with a five-percent transient accommodations tax. Also, funds were earmarked for tourism promotion and infrastructural development by the Counties and additional advertising by the HVB. Thus, in the near future, we believe Hawaii will become increasingly effective in competing not only for more visitors, but also for higher-spending and longer-staying visitors.

And, in 1987, the State Legislature appropriated \$15,000,000 for each of the following two years for tourism promotion, market development, infrastructure improvements and HVB operations.

The State has prepared population and employment projections upon which it has based a number of its plans, and which it recommends for planning purposes. The "most likely" projection is based upon the estimate that the number of overnight and longer State visitors would increase at the rate of 5 percent per year from 1980 to 1985, 4 percent per year from 1985 to 1990, 3 percent per year from 1990 to 1995, and 2 percent per year from 1995 to 2000. Current activity indicates that the slowdown in 1980 and 1981 has been offset by a

Table IV-4 FORECAST OF OVERNIGHT VISITORS  
State of Hawaii  
1980 - 2000

| Year | Westbound | Eastbound | Total     |
|------|-----------|-----------|-----------|
| 1980 | 3,046,000 | 888,000   | 3,934,000 |
| 1985 | 3,700,000 | 1,200,000 | 4,900,000 |
| 1990 | 4,700,000 | 1,500,000 | 6,200,000 |
| 1995 | 5,300,000 | 1,800,000 | 7,100,000 |
| 2000 | 5,600,000 | 2,200,000 | 7,800,000 |

rapid recovery, and that without, perhaps, an airline strike, the State forecast for 1985 would have been achieved. We believe that the State forecasts to 2000 are also achievable. Although the forecasts shown in Table IV-4 are our own, they match closely those made by the State.

Occupancy levels usually reflect the relationship of demand to supply. In light of a forecast of increased visitations relative to supply, occupancy rates appear to be headed for further increases. Pressures resulting from increased demands are measured in terms of price levels. As occupancy rates increase, so should room rates.

Thus, continually increasing demand, relative to new supply, will create additional pressures in the State transient accommodations market resulting in both increased occupancies and higher average daily room rates.

To meet rising demand, resort multifamily units have been utilized increasingly as transient accommodations.

SOURCE: Ming Chew Associates

V. COUNTY OF HAWAII VISITOR INDUSTRY

A. Visitor Count

The number of visitors to the neighbor islands in general has increased faster than to the State as a whole due to extensive promotion of neighbor island destinations, more repeat visitors who visit Waikiki initially and who now prefer neighbor island amenities, additional recreational facilities to attract visitors, more facilities available to accommodate them, and more recently, direct flights from the U.S. Mainland west coast each of the neighbor islands.

Table V-1 shows the proportion of westbound visitors to Hawaii staying overnight or longer who indicated their intention to visit the neighbor islands. The proportions shown represent all westbound visitors staying overnight and longer, including those destined to Hawaii and those traveling beyond Hawaii. As seen, the proportion intending to visit the Big Island of Hawaii increased from 37.1 percent in 1970 to a high of almost 40 percent in 1971, before beginning an almost continuous decline to 18.5 percent in 1986. In contrast, the proportion intending to visit Maui increased almost continuously from 37.3 percent in 1970 to 50.3 percent in 1983 but since has declined to 47.1 percent in 1986. The share of visitations to Kauai on the other hand, generally peaked at 36.0 percent in 1971, declined to 21.1 percent in 1983, before slowly increasing again to 23.9 percent in 1986.

The HVB provides estimates of Japanese visitors to the State and to the Big Island of Hawaii. Assuming that ten percent of the other eastbound visitors visited the Big Island, we estimate that the percent of total eastbound visitors to the Big Island ranged from 16 to 19 percent between 1977 and 1983. New surveys conducted in 1985 and 1987 indicate that the percentage of eastbound visitors intending to visit the Big Island has declined.

Applying these factors to the historical levels of tourism to the State resulted in our estimate of visitors to the Big Island shown in Table V-2. As seen, estimated westbound visitors almost doubled from 511,000 in 1970 to 955,000 by 1978, before declining to 675,000 in 1981. The number of westbound visitors is estimated to have rebounded to about 788,000 in 1986.

Table V-1  
ESTIMATED NEIGHBOR ISLAND VISITORS (1)  
State of Hawaii  
1970 - 1986

| Year | Estimated Percentages |         |          |
|------|-----------------------|---------|----------|
|      | To Hawaii             | To Maui | To Kauai |
| 1970 | 37.1                  | 37.3    | 34.3     |
| 1971 | 39.8                  | 42.3    | 36.0     |
| 1972 | 39.2                  | 43.7    | 34.8     |
| 1973 | 36.7                  | 40.6    | 31.2     |
| 1974 | 36.8                  | 42.2    | 29.8     |
| 1975 | 37.3                  | 44.1    | 30.7     |
| 1976 | 34.1                  | 46.4    | 29.2     |
| 1977 | 32.2                  | 48.2    | 28.4     |
| 1978 | 31.5                  | 48.6    | 29.0     |
| 1979 | 28.5                  | 47.0    | 27.3     |
| 1980 | 25.9                  | 47.0    | 26.6     |
| 1981 | 23.6                  | 48.7    | 26.6     |
| 1982 | 21.6                  | 49.3    | 23.3     |
| 1983 | 21.8                  | 50.3    | 21.1     |
| 1984 | 20.5                  | 50.0    | 22.0     |
| 1985 | 18.8                  | 49.5    | 22.5     |
| 1986 | 18.5                  | 47.1    | 23.9     |

(1) Westbound visitors staying overnight and longer, including visitors destined to Hawaii and those traveling beyond Hawaii, and a pro-rata share of non-respondents.

SOURCE: Hawaii Visitors Bureau, Annual Research Reports; Ming Chew Associates.



Table V-2 VISITOR ESTIMATES AND FORECASTS  
County of Hawaii  
1970 - 2000

| Year      | Westbound        |                    | Eastbound(1)     |                    | Both Directions(2) |                    |
|-----------|------------------|--------------------|------------------|--------------------|--------------------|--------------------|
|           | Percent of State | Estimated Visitors | Percent of State | Estimated Visitors | Estimated Visitors | Estimated Visitors |
| 1970      | 37.1             | 511,000            | --               | --                 | --                 | --                 |
| 1971      | 39.8             | 569,000            | --               | --                 | --                 | --                 |
| 1972      | 39.2             | 699,000            | --               | --                 | --                 | --                 |
| 1973      | 36.7             | 759,000            | --               | --                 | --                 | --                 |
| 1974      | 36.8             | 804,000            | --               | --                 | --                 | --                 |
| 1975      | 37.3             | 823,000            | --               | --                 | --                 | --                 |
| 1976      | 34.1             | 870,000            | --               | --                 | --                 | --                 |
| 1977      | 32.2             | 890,000            | 18               | 118,000            | 1,008,000          | 1,008,000          |
| 1978      | 31.5             | 955,000            | 19               | 121,000            | 1,076,000          | 1,076,000          |
| 1979      | 28.5             | 895,000            | 19               | 156,000            | 1,051,000          | 1,051,000          |
| 1980      | 25.9             | 789,000            | 16               | 142,000            | 931,000            | 931,000            |
| 1981      | 22.7             | 675,000            | 17               | 163,000            | 838,000            | 838,000            |
| 1982      | 21.5             | 705,000            | 18               | 174,000            | 879,000            | 879,000            |
| 1983      | 21.8             | 740,000            | 16               | 156,000            | 896,000            | 896,000            |
| 1984      | 20.5             | 763,000            | 14               | 158,000            | 921,000            | 921,000            |
| 1985      | 18.8             | 697,000            | 12               | 141,000            | 838,000            | 838,000            |
| 1986      | 18.5             | 788,000            | 11               | 148,000            | 936,000            | 936,000            |
| Forecast: |                  |                    |                  |                    |                    |                    |
| 1990      | 25               | 1,175,000          | 15               | 225,000            | 1,400,000          | 1,400,000          |
| 1995      | 28               | 1,484,000          | 18               | 324,000            | 1,808,000          | 1,808,000          |
| 2000      | 30               | 1,680,000          | 20               | 440,000            | 2,120,000          | 2,120,000          |

(1) Estimates through 1983 based upon surveys of Japanese visitors and the assumption that ten percent of other Eastbound visitors visit Hawaii County.  
(2) Westbound only until 1977.

SOURCE: Hawaii Visitors Bureau, Annual Research Reports and Japanese Visitor Opinion Surveys; Ming Chew Associates.

The number of eastbound visitors to the Big Island has increased almost continuously from 1977, when the first estimates were made, to 1984. Current indications, however, show a general decline in eastbound visitors in 1985, but a slight gain in 1986.

The table also shows our forecasted capture of the State market to 2000. Although the share of westbound visitors to Hawaii County declined to 18.5 percent in 1986, it has rebounded to 21 percent in the first quarter of 1987. We anticipate that the proportion of westbound visitors to Hawaii County will continue the rebound, and increase to 30 percent by 2000. This assessment reflects anticipated efforts to divert tourism from Waikiki and Oahu to the neighbor islands, preference for neighbor island amenities by the increasing number of repeat visitors to the State, the recent addition of new visitor facilities on the island, direct flights from the U.S. Mainland west coast to Kona by United Airlines and its increased promotional efforts to stimulate travel to the neighbor islands.

The actual number of westbound visitors reversed its decline in 1986, and is up another 5.6 percent in the first quarter of 1987. As seen from the table, the number of westbound Big Island visitors is projected to increase from an estimated level of 38,000 in 1986 to 1,680,000 by 2000.

An increasing proportion of eastbound visitors is also expected to visit Hawaii County for the same reasons indicated for westbound visitors. In this case though, Japan Air Lines, the major eastbound air carrier, has increased its promotional efforts to stimulate travel to the neighbor islands as a new travel experience. As a result, the number of eastbound visitors to the Island is expected to increase from 148,000 in 1986 to 440,000 by 2000.

Combined eastbound and westbound travel to the Island is projected to increase from 936,000 in 1986 to 2,120,000 by 2000.

B. Characteristics of Hawaii County Tourism

The Big Island of Hawaii contains a variety of features, many unique, which has made it a very popular place for sightseeing. For example, the island has the two highest peaks in the State, two of the few active

Table V-3  
 DISTRIBUTION OF TOTAL  
 TRANSIENT ACCOMMODATIONS(1)  
 County of Hawaii  
 1970 - 1986

| Year | Hilo  |                | Kona  |                | Kohala(2) |                | Other(2) |                | County<br>Units | % of<br>County |
|------|-------|----------------|-------|----------------|-----------|----------------|----------|----------------|-----------------|----------------|
|      | Units | % of<br>County | Units | % of<br>County | Units     | % of<br>County | Units    | % of<br>County |                 |                |
| 1970 | 1,345 | 38.6%          | 1,752 | 50.3%          | -         | -              | 389      | 11.1%          | 3,486           | 100.0%         |
| 1971 | 1,547 | 36.5           | 2,306 | 54.4           | -         | -              | 388      | 9.1            | 4,241           | 100.0          |
| 1972 | 1,817 | 37.9           | 2,582 | 53.8           | -         | -              | 397      | 8.3            | 4,796           | 100.0          |
| 1973 | 1,782 | 34.0           | 3,009 | 57.5           | -         | -              | 443      | 8.5            | 5,234           | 100.0          |
| 1974 | 1,850 | 34.6           | 3,055 | 57.1           | -         | -              | 443      | 8.3            | 5,348           | 100.0          |
| 1975 | 2,167 | 35.9           | 3,423 | 56.6           | -         | -              | 455      | 7.5            | 6,045           | 100.0          |
| 1976 | 2,130 | 35.9           | 3,331 | 56.1           | -         | -              | 468      | 8.0            | 5,929           | 100.0          |
| 1977 | 1,957 | 32.6           | 3,543 | 59.0           | -         | -              | 502      | 8.4            | 6,000           | 100.0          |
| 1978 | 1,954 | 32.1           | 3,637 | 59.7           | -         | -              | 502      | 8.2            | 6,093           | 100.0          |
| 1979 | 1,954 | 33.2           | 3,437 | 58.4           | -         | -              | 498      | 8.4            | 5,889           | 100.0          |
| 1980 | 1,944 | 29.0           | 4,193 | 62.5           | 483       | 7.2%           | 85       | 1.3            | 5,705           | 100.0          |
| 1981 | 1,762 | 24.6           | 4,249 | 59.3           | 1,078     | 15.0           | 78       | 1.1            | 7,169           | 100.0          |
| 1982 | 1,648 | 22.0           | 4,397 | 58.9           | 1,342     | 18.0           | 82       | 1.1            | 7,469           | 100.0          |
| 1983 | 1,194 | 16.7           | 4,448 | 62.2           | 1,422     | 19.9           | 85       | 1.2            | 7,149           | 100.0          |
| 1984 | 1,313 | 17.5           | 4,748 | 63.2           | 1,365     | 18.2           | 85       | 1.1            | 7,511           | 100.0          |
| 1985 | 1,323 | 18.2           | 4,489 | 61.6           | 1,383     | 19.0           | 85       | 1.2            | 7,280           | 100.0          |
| 1986 | 1,335 | 18.2           | 4,486 | 61.2           | 1,422     | 19.4           | 85       | 1.2            | 7,328           | 100.0          |

(1) HVB Visitor Plant Inventory data for February of following year.

(2) Kohala data included with "Other" until 1980.

SOURCE: Ming Chew Associates

volcanoes in the nation, massive lava fields, the only producing coffee industry in the United States, the largest orchid industry in the country, the largest working ranch in the nation, black sand beaches, white sand beaches, lava rock coastlines, state and national historical parks, rain forests, waterfalls, deserts and a number of historical areas.

In March 1984, Mauna Loa erupted for the first time since 1975. Less than a week later, Kilauea erupted. It had been over 100 years since these two volcanoes had concurrent eruptions.

The popularity of the Big Island for sightseeing is reflected by selected attendance figures. For example, the Hawaii Volcanoes National Park recorded one of the largest attendances among attractions in the State in 1985. Actually, the Big Island contains three of the State's four national park system facilities: the Hawaii Volcanoes National Park, Puuhonua O Honaunau National Historical Park (City of Refuge) and the Puukohola Heiau National Historical Site. The reported 1,032,000 visits to the Hawaii Volcanoes National Park is greater than the level of tourism estimated to the island, suggesting that attendance at the park includes multiple visits, visits by local residents, visits by residents of other islands and trips by visitors who decided to visit the Park after arriving in the State.

According to HVB surveys, the average stay of westbound visitors intending to visit the Big Island was 4.6 days in 1986, up from 2.9 days in 1970.

A number of destination resort areas with self-contained recreation facilities have been developed on the Big Island. These include the Mauna Kea Resort, Mauna Lani Resort and Waikoloa in the Kohala Coast Resort Region, Kona Village at Kaupulehu and Keauhou which is situated south of Kailua-Kona. Development has also occurred at C. Brewer's Sea Mountain at Ninole.

Although there are only limited recreational facilities in either Hilo or Kailua-Kona, these two areas historically have contained most of the visitor plant facilities on the island. The next table, Table V-3, shows the distribution of transient accommodations on the island, and Table V-4 shows occupied units calculated from average occupancy figures provided by the HVB and Pannell Kerr Forster. From 1970 to February 1987, the total number of transient accommodation units in the county increased from 3,486 to 7,328, a gain of 110 percent. Occupied rooms increased only 96 percent

Table V-4  
DISTRIBUTION OF OCCUPIED  
TRANSIENT ACCOMMODATIONS(1)  
County of Hawaii  
1970 - 1986

| Year | Hilo                   |                | Kona                   |                | Kohala(2)              |                | Other(2)               |                | County                 |                |
|------|------------------------|----------------|------------------------|----------------|------------------------|----------------|------------------------|----------------|------------------------|----------------|
|      | Occu-<br>Pied<br>Units | % of<br>County | Occu-<br>Pied<br>Units | % of<br>County | Occu-<br>Pied<br>Units | % of<br>County | Occu-<br>Pied<br>Units | % of<br>County | Occu-<br>Pied<br>Units | % of<br>County |
| 1970 | 928                    | 39%            | 1,183                  | 50%            | -                      | -              | 270                    | 11%            | 2,381                  | 100%           |
| 1971 | 984                    | 37             | 1,402                  | 52             | -                      | -              | 282                    | 11             | 2,668                  | 100            |
| 1972 | 1,183                  | 40             | 1,492                  | 50             | -                      | -              | 294                    | 10             | 2,969                  | 100            |
| 1973 | 1,126                  | 34             | 1,814                  | 56             | -                      | -              | 321                    | 10             | 3,261                  | 100            |
| 1974 | 1,121                  | 34             | 1,809                  | 55             | -                      | -              | 343                    | 11             | 3,273                  | 100            |
| 1975 | 1,242                  | 34             | 2,030                  | 56             | -                      | -              | 338                    | 9              | 3,610                  | 100            |
| 1976 | 1,094                  | 32             | 1,948                  | 57             | -                      | -              | 369                    | 11             | 3,410                  | 100            |
| 1977 | 1,037                  | 28             | 2,260                  | 61             | -                      | -              | 383                    | 10             | 3,680                  | 100            |
| 1978 | 1,083                  | 22             | 2,480                  | 63             | -                      | -              | 385                    | 10             | 3,948                  | 100            |
| 1979 | 1,016                  | 28             | 2,336                  | 62             | -                      | -              | 375                    | 10             | 3,629                  | 100            |
| 1980 | 762                    | 22             | 2,336                  | 66             | 379                    | 11%            | 55                     | 1              | 3,542                  | 100            |
| 1981 | 622                    | 20             | 2,099                  | 66             | 421                    | 13             | 47                     | 1              | 3,189                  | 100            |
| 1982 | 615                    | 18             | 2,062                  | 62             | 618                    | 19             | 49                     | 1              | 3,344                  | 100            |
| 1983 | 468                    | 14             | 2,090                  | 63             | 725                    | 22             | 51                     | 1              | 3,334                  | 100            |
| 1984 | 764                    | 18             | 2,607                  | 61             | 864                    | 20             | 51                     | 1              | 4,286                  | 100            |
| 1985 | 765                    | 18             | 2,581                  | 61             | 873                    | 20             | 51                     | 1              | 4,270                  | 100            |
| 1986 | 740                    | 16             | 2,898                  | 62             | 986                    | 21             | 51                     | 1              | 4,675                  | 100            |

(1) Average annual occupancy rates reported by HVB applied to HVB Visitor Plant Inventory data for February of following year.

(2) Kohala data included with "Other" until 1980. Occupancies estimated by Ming Chew Associates from 1980.

SOURCE: Ming Chew Associates

during the same period from an estimated 2,381 occupied units in 1970 to 4,675 occupied units in 1986. Meanwhile, tourism to the State in both directions increased by 221 percent, indicating that the County of Hawaii did not achieve its proportional share of growth as measured by occupied rooms.

Beginning in 1981 with the completion of the Sheraton Royal Waikoloa in the Waikoloa Beach Resort, the share of transient accommodations outside Kona and Hilo (predominantly the Kohala Coast Resort Region) increased sizeably. By February 1983, with the opening of the Mauna Lani Bay Hotel in the Mauna Lani Resort, the portion of units essentially on the Kohala Coast began to approach that in Hilo. Later, as a result of continued removal of units in the Hilo inventory for other uses, the total number of transient accommodation units in North and South Kohala exceeded for the first time the number in Hilo. Soon after, the number of occupied units, essentially on the Kohala Coast, exceeded the number of occupied units in Hilo.

Much of the visitor plant in Hilo and Kona had been oriented toward group travelers which represented 47 percent of westbound visitors to the State in 1974, but only 15 percent in 1986.

The seasonality of tourism to the Island can be observed from the monthly occupancy rates shown in Table V-5. Occupancies in Kona have exceeded those in Hilo since about 1975. Based upon earlier surveys conducted by the HVB, occupancies for visitor accommodations located outside Hilo and Kona had been generally higher than the island-wide averages.

Almost all visitors to the Island arrive by air. Until recently, Hilo was the State's only other gateway outside of Honolulu served directly by overseas airlines. Early in 1983, United Airlines began flying from the U.S. Mainland west coast directly to Maui's Kahului Airport. In September 1983, United began flying directly from the west coast to Ke-ahole Airport, which serves Kona and the Kohala Coast, before returning through Hilo. General Lyman Field in Hilo is capable of accommodating Boeing 747 and other wide-bodied aircraft. General Lyman Field, Ke-ahole, and Waimea-Kohala Airport, serving Waimea and Kohala, can accommodate the DC-9 and Boeing 737 inter-island jet aircraft. More interisland flights including those of scheduled commuter airlines serve Kona than the other two airports. Princeville Airways serves Waikoloa using an airstrip situated on an abandoned roadway.

Table V-5 OCCUPANCY IN TRANSIENT ACCOMMODATIONS  
County of Hawaii  
1972 - 1986

| Year      | (Percent) |      |     | Island<br>Of<br>Hawaii |
|-----------|-----------|------|-----|------------------------|
|           | Kona      | Hilo |     |                        |
| 1972      | 56%       | 65%  | 59% |                        |
| 1973      | 61        | 63   | 62  |                        |
| 1974      | 58        | 63   | 60  |                        |
| 1975      | 59        | 56   | 58  |                        |
| 1976      | 58        | 52   | 56  |                        |
| 1977      | 63        | 49   | 58  |                        |
| 1978      | 69        | 52   | 64  |                        |
| 1979      | 65        | 45   | 58  |                        |
| 1980      | 59        | 34   | 51  |                        |
| 1981      | 49        | 35   | 45  |                        |
| 1982      | 47        | 38   | 44  |                        |
| 1983      | 47        | 39   | 45  |                        |
| 1984      | 55        | 58   | 56  |                        |
| 1985      | 58        | 58   | 58  |                        |
| 1986      | 65        | 55   | 63  |                        |
| January   | 71%       | 55   | 68% |                        |
| February  | 85        | 64   | 82  |                        |
| March     | 73        | 55   | 69  |                        |
| April     | 62        | 56   | 61  |                        |
| May       | 57        | 48   | 56  |                        |
| June      | 51        | 51   | 51  |                        |
| July      | 53        | 53   | 53  |                        |
| August    | 69        | 58   | 67  |                        |
| September | 52        | 62   | 53  |                        |
| October   | 67        | 55   | 66  |                        |
| November  | 64        | 71   | 64  |                        |
| December  | 58        | 58   | 58  |                        |

VI. MARKET ANALYSIS FOR TRANSIENT ACCOMMODATIONS

The demand for transient accommodations in Hawaii has expanded dramatically due to rapid growth of State tourism. Furthermore, each delineated market segment now has grown sufficiently to support a wide variety of accommodations, as well as recreation and amusement facilities.

Long distance travel is a component of the leisure market, and is dependent upon the availability of large amounts of discretionary leisure time and discretionary income, both of which have been increasing over recent years due to economic growth worldwide (despite short temporary setbacks), expanding population and increasing interest in travel. Furthermore, improvements in transportation technology have reduced travel time so that areas considered remote in the past are now readily accessible. Aircraft technology and airline deregulation have also reduced costs, permitting large numbers of persons previously constrained by financial requirements to travel greater distances. By expanding both the geographic dimensions of the market and reducing travel costs, transportation improvements have substantially broadened the market area from which patronage can be drawn.

However, larger market area dimensions have also multiplied the number of tourist destinations vying for the traveler and his expenditures; thus, competition for visitors and patronage has intensified. The extent of the competition has increased the difficulty of creating an effective market image to attract visitors from the expanded market area.

The transient accommodations market is highly segmented with each specific segment having different requirements. This allows operators to either focus attention on capturing a narrow segment of the market, or attempt to appeal to all segments, but with a potential loss of efficiency.

Market segmentation also allows facilities catering to different classifications of patrons to co-exist in an area so long as each segment is of an economic size. Aggregations of facilities in a single locale add to the area's cumulative attraction. This increases the likely draw to the area and makes more viable each of the entities operating therein. Variety, quality and quantity of both amenities and facilities are all very important when trying to merchandise transient accommodations to broad market segments.

SOURCE: Pannell Kerr Forster

A. Methodology

Market analysis is accomplished by comparing factors of demand with factors of supply. First, the patterns of historical demand are evaluated, and then Statewide demand projected. State demand is delineated after analyzing the relative attractions of each island, and its respective resort regions. The current and anticipated supply of competitive facilities is compiled and differentiated to compare with the delineated demand. Differences between supply and demand are used to identify the prospects for new developments.

In order to delineate demand by regions within the State, a current and anticipated inventory of facilities in each competitive resort region is tabulated. Based upon the envisaged "cumulative attraction" of the subject region or proposed project relative to competing regions or projects, subjective estimates of potential market capture are made. Market potential is then determined by measuring imbalances between anticipated supply conditions and delineated forecasts of demand.

B. Supply Factors

Until recently, there were only two large concentrations of transient accommodations on the island, Hilo and Kona. The Kohala Coast Resort Region, however, in just a few years has become one of the island's major destination areas, and now exceeds Hilo in terms of the number of transient units available.

1. Hilo Supply

Hilo's role in Big Island tourism historically has been to accommodate overnight visitors beginning or concluding their visit to the island. Tourism received a boost when General Lyman Field was expanded to handle direct flights from the U.S. Mainland, making Hilo the State's second gateway or departure point after Honolulu. Major stimulation occurred also in 1968 and 1969 when a "hotel row" began developing along Banyan Drive. Since then, nearly all major hotels have also been built there.

The visitor pattern in Hilo consists mainly of sightseeing and a stay of only one night, despite the fact that the island's most popular visitor attractions are within a radius of 30 miles.

These sights include the Hawaii Volcanoes National Park, Kalapana Black Sand Beach, orchid nurseries, macadamia nut factories, Rainbow and Akaka Falls, Boiling Pots and the Lyman Museum.

The major cause of this visitor pattern is probably the lack of the "sun, surf and sand" requisite of Hawaii resort regions. The high incident of rainfall, 129 inches per year or almost 0.4 inches average per day, results in a low probability of sunny days for outdoor activity. High quality swimming beaches are also lacking. Hilo is, on the other hand, an aesthetically attractive area with its quaint setting, floral variety and rich vegetation. Nonetheless, by most standards, Hilo does not qualify as a destination resort region.

In fact, with decreasing group travel, Hilo has experienced sharp declines in visitor activity. The number of accommodations has been reduced as a result of conversions to office and other uses. United Airlines recently terminated its direct flights from the U.S. Mainland to Hilo, flying instead directly to Maui and directly to Keahole Airport in Kona. The flight to Kona returns to Log Angeles through Hilo.

A breakdown of Hilo's visitor plant inventory by price range indicates that largest proportion of rooms is priced in the published rate range of \$50 to \$74 per night for superior room, double occupancy.

2. Kona Supply

Kona's tourism role traditionally has been to accommodate sightseeing vacationers and those desiring rest and relaxation. It also served Kamaainas who sought a reprieve from the pace of Honolulu. As such, most of the accommodations were rather modest. Passive recreation was promoted and the amount of active recreation facilities was limited. Few of the transient accommodations contained a full range of resort amenities.

As tourism expanded, the character of the visitor to Kona, and Kona itself, changed. Destination resort communities such as Keauhou-Kona Resort and Kona Village Resort have developed outside the

Town of Kailua. Keauhou contains more active recreational amenities, extensive entertainment in its hotels, resort houseslots, a shopping center and expanded golf course. Keauhou itself now contains 39 percent of all transient accommodations in Kona.

There is a broad spread of accommodations with published prices ranging from under \$50 per night for double occupancy, to a reported \$265 to \$395 per night room rate at the Kona Village Resort including all meals on the full American plan. Most of the recent developments contain more amenities than the older ones and are also priced higher. The largest proportion of the transient accommodations have published rates of \$75 to \$99 per night for double occupancy.

### 3. North and South Kohala Supply

The supply of transient accommodations in North and South Kohala consists, essentially, of those contained in the resorts located in the Kohala Coast Resort Region. A small number of very modest accommodations are located in the towns of Waimea and Hilo.

Even though it contains the world renowned Mauna Kea Resort, the entire Kohala Coast Resort Region is only beginning to be fully recognized as a major destination resort region.

The Region has the lowest recorded rainfall in the State and therefore, the highest proportion of sunny days. It has white sand beaches with calm swimming water, attractive views of the ocean and the four major land masses on the Island including both Mauna Kea and Mauna Loa, and Haleakala on the Island of Maui. These characteristics of "sun, surf and sand" have led to the recent development of Waikoloa Beach Resort and Mauna Kea Resort in very close proximity to each other and to the Mauna Kea Resort which commenced operations in 1965 as a free-standing destination resort. The Sheraton Royal Waikoloa began operations in 1981, and the Mauna Kea Hotel opened in February 1983.

All of the hotel rooms in the three resorts on the Kohala Coast are in the luxury category with published rates of \$100 and above, with the largest number with published rates in excess of \$200 per night.

### 4. Summary of Accommodations

Table VI-1 summarizes the number and location of transient accommodations on the Big Island by price range. Projects which are HVB members or which are managed by HVB members contain a total of 5,530 units. More than half of these units are located in Kona. The next largest concentration is in North and South Kohala, followed closely by the number in Hilo.

Units in Hilo have published rates up to \$74, whereas the predominant range in Kona is between \$50 and \$149. For Kohala, the predominant range of published room prices is \$100 and over with the largest number in the \$200+ category. Moreover, the Kohala Coast Resort Region contains 87 percent of the units on the Island with published room rates over \$200. The relative rates are indicative of the character of the areas and the general images these major areas have created for themselves.

### C. Demand Factors

In prior chapters, visitor forecasts were made for the State and delineated into projections for Hawaii County. As shown earlier, State tourism is projected to grow at the rate of 3.1 percent per year from 1985 to 2000, and County tourism at 4.8 percent per year during the same period.

Underlying these projections, particularly the higher County growth rate, is the assumption the Kohala Coast Resort Region will continue to experience substantial Resort development during the next 13 years. Addition of such facilities will enhance the competitive position of the Region relative to other parts of the Island, and of the Island relative to others in the State. The Region itself, must compete directly with other State resort regions, just as the Westin Mauna Kea has been doing for a number of years.

Table VI-1  
SUMMARY OF PRIMARY TRANSIENT  
ACCOMMODATIONS BY PRICE RANGE(1)  
County of Hawaii  
1987

| District<br>OR<br>Region                   | Units<br>(2) | Less<br>Than<br>\$50 | \$50-<br>\$74 | \$75-<br>\$99 | \$100-<br>\$149 | \$150-<br>\$199 | \$200+ | Estimated<br>Average<br>Published<br>Rate |
|--------------------------------------------|--------------|----------------------|---------------|---------------|-----------------|-----------------|--------|-------------------------------------------|
| Hilo<br>Percent<br>of<br>total             | 1,204<br>22% | 455                  | 749           | -             | -               | -               | -      | \$ 54                                     |
| Kona<br>Percent<br>of<br>total             | 2,940<br>53% | 196                  | 798           | 1,045         | 799             | 2               | 100    | \$ 93                                     |
| Kohala<br>Percent<br>of<br>total           | 1,303<br>24% | 41                   | 58            | -             | 543             | -               | 661    | \$183                                     |
| Ka'u/<br>Volcano<br>Percent<br>of<br>total | 83<br>1%     | 50                   | 33            | -             | -               | -               | -      | \$ 49                                     |
| Total                                      | 5,530        | 742                  | 1,638         | 1,045         | 1,342           | 2               | 761    | \$105                                     |
| Percent<br>Distri-<br>bution               | 100%         | 13%                  | 30%           | 19%           | 24%             | 0%              | 14%    |                                           |

(1) Published rates for double occupancy superior for hotels and one-bedroom units for apartment/townhouses per night; rents may apply to studio units or cottages which were only type available.

(2) Includes projects which are HVB members or which are managed by HVB members.

SOURCE: Ming Chew Associates

Thus, in order to delineate our County demand forecasts, we evaluated the potential attraction of the Kohala Coast Resort Region relative to other regions in the State.

1. Comparison of Region With Other State Regions

Although a large number of areas in the State have relatively large concentrations of resort amenities, we have limited our comparison mainly to neighbor island, master planned resort communities with controlled environments, and the Kona resort region on the Big Island. Kona was included although it lacks swimming beaches since it is the most potentially competitive area on the Island.

From Table VI-2, it can be seen that the major neighbor island resort regions competing with the Kohala resort region are Maui, and in Kona from Kailua to Keauhou.

Of the neighbor islands, Maui contains the largest number of transient accommodations, accounting for about one-half of the inventory not on Oahu. West Maui alone, from Lahaina to Kapalua, contains 7,929 units, or more than on either the Island of Hawaii or the Island of Kauai. The resort region from Maalaea to Makena currently is the second largest neighbor island resort region in the State. Much of the attraction of Maui has resulted from the quantity, quality and diversity of activities and amenities including extensive sandy beaches and golf courses, as well as over a decade of coordinated promotion of Maui as a resort destination area.

The third largest resort region on the neighbor islands is Kona on the Island of Hawaii. However, except for the number of boat harbors, the amount of recreational amenities such as golf courses in this region is relatively limited, particularly in relationship to the inventory of accommodations.

At present, North and South Kohala contains a reported 1,422 transient accommodation units. Almost 900 of these units have been added beginning in 1981 with the construction in Waikoloa Beach Resort and Mauna Lani Resort.

Table VI-2 DISTRIBUTION OF NEIGHBOR ISLAND  
TRANSIENT ACCOMMODATIONS BY  
MAJOR RESORT REGIONS  
State of Hawaii  
1987

|                                           | Transient<br>Accommodation<br>Units(1) | Golf Courses(2) |
|-------------------------------------------|----------------------------------------|-----------------|
| <u>Hawaii:</u>                            |                                        |                 |
| North and South Kohala (3)                | 1,422                                  | 4               |
| Kona                                      | 4,486                                  | 1 (27 holes)    |
| Other (including Hilo)                    | <u>1,420</u>                           | 5 (two 9-hole)  |
| Total                                     | 7,328                                  |                 |
| <u>Maui:</u>                              |                                        |                 |
| West Maui (Lahaina,<br>Kaanapali, Napili) | 7,929                                  | 4               |
| Kihei-Wailea-Makena                       | 4,810                                  | 3               |
| Other (including Kahului)                 | <u>525</u>                             | 2               |
| Total                                     | 13,264                                 |                 |
| <u>Molokai:</u>                           | 575                                    | 1               |
| <u>Kauai:</u>                             |                                        |                 |
| Wailua-Kapaa                              | 2,721                                  | 1               |
| Poipu                                     | 1,872                                  | 1               |
| Hanalei                                   | 1,137                                  | 1 (27 holes)    |
| Other (including Lihue)                   | <u>1,225</u>                           | 1 (9-hole)      |
| Total                                     | 5,956                                  |                 |

- (1) As of February 1987.  
(2) Open to the public.  
(3) Mainly the Kohala Coast Resort Region

SOURCE: Ming Chew Associates

The 1,260-room Hyatt Waikoloa Hotel "super-resort" is under construction and scheduled to open in late 1988. These resorts have added championship golf courses each to the two that already existed, giving this resort region four championship courses in close proximity, as many as now exists in the West Maui resort region.

Combining this popular sport with a large number of tennis courts, excellent swimming beaches, good boating and diving facilities, and nearby marinas will enhance the recreation orientation of this destination area. Other recreation activities include trail riding and equestrian activities, hunting, skeetshooting and even skiing on Mauna Kea. A polo field has been completed at Waikii Ranch, and another has been proposed at Waikoloa Village. Passive recreational and educational activities include inspecting petroglyphs at Waikoloa and Puako, traversing the King's Trail, visiting Puukohola Heiau National Historic Site, Lapakahi State Historic Park, and other historic sites along the coast and in Waimea. Sightseeing in other parts of the island is facilitated by the high-speed belt highway to Hilo and the Hawaii Volcanoes National Park, or to Kona and the airport at Ke-ahole.

Thus, the prospects are very good that the available "sun, surf and sand", complementary accommodations and recreational facilities, good accessibility and luxury and "super-luxury" quality of the three existing beach resorts will combine to make the Kohala Coast Resort Region one of the most attractive and certainly the highest quality in the State.

## 2. Forecast of Island Demand

Tourism forecasts for the Island were converted to projections of transient accommodations demand by estimating the average stay, multiplying by the number of visitors to calculate visitor-days, dividing by the average party size to obtain average occupied room days, and then dividing by the number of days in the year to obtain the average daily number of occupied rooms.

Table VI-3 shows these results delineated by west-bound, eastbound and intrastate travelers. As



Table VI-3

FORECAST OF TRANSIENT  
ACCOMMODATION DEMAND  
County of Hawaii  
1986 - 2000

|                      | 1986      | 1990      | 1995      | 2000      |
|----------------------|-----------|-----------|-----------|-----------|
| <u>Westbound:</u>    |           |           |           |           |
| Visitors             | 788,000   | 1,175,000 | 1,484,000 | 1,680,000 |
| Average Stay, Nights | 4.0       | 4.3       | 4.7       | 5.1       |
| Average Party Size   | 1.9       | 1.9       | 1.9       | 1.9       |
| Occupied Rooms       | 4,500     | 7,300     | 10,100    | 12,300    |
| <u>Eastbound:</u>    |           |           |           |           |
| Visitors             | 148,000   | 225,000   | 324,000   | 440,000   |
| Average Stay, Nights | 0.3       | 0.8       | 1.5       | 2.0       |
| Average Party Size   | 1.6       | 1.6       | 1.6       | 1.6       |
| Occupied Rooms       | (1)       | 300       | 800       | 1,500     |
| <u>Local:</u>        |           |           |           |           |
| Visitors             | 100,000   | 170,000   | 250,000   | 375,000   |
| Average Stay, Nights | 1.5       | 1.5       | 1.5       | 1.5       |
| Average Party Size   | 1.7       | 1.7       | 1.7       | 1.7       |
| Occupied Rooms       | 200       | 400       | 600       | 900       |
| <u>Total:</u>        |           |           |           |           |
| Visitors             | 1,036,000 | 1,570,000 | 2,058,000 | 2,495,000 |
| Average Stay, Nights | 3.2       | 3.5       | 3.8       | 4.0       |
| Average Party Size   | 1.9       | 1.9       | 1.9       | 1.9       |
| Occupied Rooms       | 4,700     | 8,000     | 11,500    | 14,700    |
| (1) Less than 100    |           |           |           |           |

SOURCE: Ming Chew Associates.

seen, total room demand in terms of occupied units was estimated to be 4,700 units in 1986. Compared to the reported visitor plant inventory of 7,328 units, the overall occupancy of the Island of Hawaii for 1986 would have been about 64 percent. The demand is projected to increase to 8,000 units by 1990, 11,500 units by 1995 and to 14,700 units by 2000.

3. Delineation of Island Demand by Sub-area

The pattern of occupancy in visitor facilities for different sub-areas was analyzed to aid in allocating the projected island-wide demand. Although total visitor plant inventory reflects the level of building activity in each sub-area, the trends in occupied units more adequately reflects the competitive position of each resort district.

The relative role of Hilo has been declining since at least 1970. Until about 1980, this decline was offset by a corresponding increase by Kona. In general, the relative role of all other areas, including the Kohala Coast, was stable from 1970 until 1980. Since 1981, however, the relative position of the Kohala Coast has increased rapidly. By the end of 1986, the number of both total and occupied units in North and South Kohala, mainly in the Kohala Coast Resort Region, exceeded the number in Hilo.

Table VI-4 shows our projections of both occupied room and total room demand by resort region for the Island.

We project that the demand for occupied units in Hilo will increase from 740 units in 1986, and to 1,400 by 2000. Nonetheless, we anticipate that Hilo's relative market position will continue to decline. Assuming a 70 percent occupancy rate, the demand for total units is projected to increase from 1,000 in 1986 to 2,000 in 2000, compared to the current inventory of 1,335 units.

The demand for occupied units in Kona is expected to continue to rebound from the low experienced in about 1982. The relative share of occupied units in Kona will continue to decline though, as Kohala is projected to gain very rapidly both in terms of the number of occupied units and market share on the Island.

Table VI-4

PROJECTION OF TRANSIENT  
ACCOMMODATION DEMAND BY RESORT REGION  
County of Hawaii  
1986 - 2000

| Occupied Units:                                   | Hilo  | Kona  | Kohala | Other | Total<br>County |
|---------------------------------------------------|-------|-------|--------|-------|-----------------|
| 1986                                              | 740   | 2,898 | 986    | 51    | 4,675           |
| 1990                                              | 1,000 | 4,200 | 2,500  | 300   | 8,000           |
| 1995                                              | 1,200 | 5,700 | 4,100  | 500   | 11,500          |
| 2000                                              | 1,400 | 6,900 | 5,500  | 900   | 14,700          |
| Estimated Total<br>Demand at 70%<br>Occupancy:(1) |       |       |        |       |                 |
| 1986                                              | 1,100 | 4,100 | 1,400  | 100   | 6,700           |
| 1990                                              | 1,400 | 6,000 | 3,600  | 400   | 11,400          |
| 1995                                              | 1,700 | 8,100 | 5,900  | 700   | 16,400          |
| 2000                                              | 2,000 | 9,800 | 7,900  | 1,300 | 21,000          |
| Visitor Plant<br>Inventory:                       |       |       |        |       |                 |
| February 1987                                     | 1,335 | 4,486 | 1,422  | 85    | 7,328           |

(1) Rounded

SOURCE: Hawaii Visitors Bureau, Visitor Plant Inventory,  
February 1987; Ming Chew Associates.

As seen in Table VI-4, the demand for transient accommodations in Kona is projected to increase from 4,100 units in 1986, to 9,800 in 2000. In North and South Kohala, it is projected to increase from 1,400 units in 1986, to 7,900 in 2000. When compared to existing supply, Kohala is projected to need an additional 6,500 units, while Kona would need only another 5,300 units by 2000.

In general, it appears that market conditions in Kohala are in balance, and that Hilo and Kona are slightly over-supplied at present. Based upon projected demand, Hilo and Kona should reach market equilibrium shortly.

D. Estimated Marketability of Transient Accommodations

1. Demand

The preceding projections reflect that a demand would exist in North and South Kohala for another 2,200 units by 1990, 4,500 units by 1995 and 6,500 units by 2000.

We believe that most of the demand will be satisfied in the Kohala Coast Resort Region within Waikoloa, Mauna Lani and the lands being developed by Mauna Kea Properties, Inc. Waikoloa can be categorized as a luxury resort, whereas the Mauna Kea Resort and Mauna Lani could be classified as "super luxury" resorts. These differentiations are due in part to the image that has been promoted, types and quality of facilities developed, development densities and clientele attracted. Published room rates at Waikoloa are also lower than at the "super luxury" resorts. Even though the Hyatt Regency Waikoloa has been dubbed a "super resort", its primary clientele is not expected to be guests seeking "super luxury" amenities.

At present, the Westin Mauna Kea accounts for 22 percent of the transient accommodations in North and South Kohala, and about 26 percent of the major hotel units. It is currently the smallest (310 rooms) of the three hotels in the major resorts on the Kohala Coast. In the very near future, however, we estimate that Mauna Kea Resort will be essentially at its capacity.

This means Mauna Kea Resort, itself, would not be available to accommodate the projected future increases in net new demand for resort facilities in North and South Kohala. Although such increases will have to be accommodated both in the Kohala Coast Resort Region or outside the coastal area, the largest portion would probably be attracted to the Kohala Coast. Due to the lack of other facilities outside the coastal area, we estimate that 70 to 80 percent of the projected new demand in North and South Kohala would likely be accommodated in Waikaloa, Mauna Lani Resort and Mauna Kea Properties' projects. Further, we estimate that Mauna Kea Properties' projects would capture slightly less than a pro rata share of the projected increases due to anticipated higher prices for their resort properties.

With these considerations in mind, we forecast that Mauna Kea Properties' projects could capture 20 percent of the projected new transient accommodations demand in North and South Kohala. These capture rates would result in demand estimates of 400 units by 1990, 900 units by 1995 and 1,300 units by 2000.

#### 2. Anticipated Supply

The most recent addition to the supply of transient accommodations on the Kohala Coast has been the 351-room Mauna Lani Bay Hotel, completed in February 1983.

Since then the 80-unit Mauna Lani Terrace super-luxury low-rise condominium apartments adjacent to the Mauna Lani Bay Hotel, the 40-unit ultra-luxury The Villas at Mauna Kea near the Westin Mauna Kea and the 116-unit Mauna Lani Point super-luxury low-rise condominium apartments have been completed. Construction is nearing completion of 72 units in The Shores at Waikaloa Beach Resort next to the golf clubhouse. We anticipate that many of these units will be made available for transient use.

As mentioned previously, the 1,250-room Hyatt Regency Waikaloa is scheduled for completion in late 1988. And, a 450-room project, to be operated as a Ritz-Carlton hotel, is scheduled to be completed in late 1989 or early 1990.

#### 3.

##### Occupancy Rates

The preceding demand analysis was based upon an estimated overall occupancy of 70 percent among all transient accommodations, including both hotel units and resort multifamily units. In arriving at this average rate, we have assumed that hotels would operate at slightly higher occupancy rates, and multifamily units would operate at somewhat lower rates. Multifamily unit buyers tolerate lower than economic occupancy rates since many of the purchases are influenced by tax-benefit considerations.

#### 4.

##### Room Rates

Room rates will be a function of competition, the image and the relative attraction of the project, locational features, and type and quality of facilities developed.

Earlier discussion of the transient accommodations market in the Kohala Coast Resort Region indicated that the preponderance of the inventory was characterized as luxury or super-luxury. The Sheraton Royal Waikaloa is characterized as a luxury project compared to the super-luxury Westin Mauna Kea and the Mauna Lani Bay Hotel. Due to its geographic position, we anticipate that the South Kohala Resort would probably be closer in quality to its neighbor, the Mauna Kea Resort.

Table VI-1 on Page 34 showed that almost all of the rooms in North and South Kohala have published daily room rates of \$100 or more for double occupancy, superior rooms. The \$100 to \$149 category is used here to indicate the luxury category, and includes the 543 rooms in the Sheraton Royal Waikaloa. The \$200+ category indicates the super-luxury category, and includes 310 rooms in the Westin Mauna Kea and 351 rooms in the Mauna Lani Bay Hotel.

With the predominant share of rooms in the luxury and super-luxury categories, much of the product marketing will be directed toward similar market segments. With the aggregate promotional effort directed at a relatively narrow market segment, we believe that basic demand for the product can be expanded. Until recently, we estimate that tens

of thousands of dollars had been spent annually to advertise the area through the efforts of one hotel. During the last few years, millions of dollars have been spent by the resorts and hotels. This concentration of promotional programs will likely modify the historical patterns of tourism activity on the Big Island. In the future, we anticipate that a larger segment of the Big Island's market will consist of the luxury and super-luxury components. This shift in market characteristics began with the completion of the Sheraton Royal Waikoloa and has been accentuated by each major development since.

Thus, it is likely that a disproportionate share of the future market potential would be the luxury and super-luxury components.

At a recommended development density of about 11 rooms per acre, which would permit construction of 350 rooms in a hotel project, we estimate that the proposed South Kohala Resort hotel could have published daily room rates in excess of \$200. This assumes that the requisite amenities and service would be provided to warrant such rates.

## VII. MARKET ANALYSIS FOR RESORT MULTIFAMILY UNITS

### A. Market Indicators

Resort multifamily units serve a number of purposes and are purchased for a number of motives. They may be used by the owner as a primary residence, used on a short-term basis as transient accommodations, rented on a long-term basis for year-round residents, or used occasionally as a second or vacation home by owners and their guests. These possible uses in turn, are influenced among other things by such factors as the location of the project, the character of its surroundings, and how the project is promoted and sold.

The South Kohala Resort would include a hotel that could handle management, and it is likely that many resort multifamily units could be made available for short-term rental purposes. Since there is a general lack of housing in the Kohala Coast compared to the relatively rapid rate of economic activity, some of the units would likely be utilized by full-time residents, too.

In general, the composite of these typical uses are reflected in historical multifamily unit sales data. However, this particular analysis is complicated by the lack of historical data in the immediate market area. Multifamily projects developed outside the three coastal resorts are not directly comparable to properties within the resorts.

The experience of resort multifamily unit sales in Kona is not directly comparable either, due to the different characteristics of the Kona resort district. For example, Kona does not possess white sand beaches or extensive golfing activities, and in generally has more passive visitor activities than does the Kohala Coast.

Resort projects on Maui appear to be somewhat more comparable in terms of beaches, climate and recreational amenities. On the other hand, even though there are four master-planned resorts on Maui, they are not located essentially adjacent to each other so that the planning, development, character, and aesthetics of the entire resort region can be controlled, as on the Kohala Coast.

Despite these differences, the limited data in the Kohala Coast Resort Region and the sales experiences in Kona and on Maui provide indicators that have aided us in formulating our conclusions.

1. Kohala Sales Activity

(a) Mauna Lani Terrace

This fee simple project fronting an old Hawaiian fishpond and a newly created lagoon, consists of 80-units on a 13.3-acre site, resulting in an average development density of 6 units per acre.

Prices at Mauna Lani Terrace were from \$275,000 to \$345,000 for the 18 one-bedroom units, \$355,000 to \$555,000 for the 54 two-bedroom units and \$705,000 to \$895,000 for the 8 three-bedroom units. The average unit price initially was about \$450,000.

Sales began in August 1982 and construction was completed in 1983. A buyer analysis indicated that most of the purchasers were California residents. About 80 to 85 percent of the buyers had visited Kohala before and were familiar with the area, suggesting that many had been guests at the Westin Mauna Kea.

(b) The Villas at Mauna Kea

The Villas at Mauna Kea consists of a 40-unit leasehold one-story project on a 29.9-acre site surrounded by fairways of the Mauna Kea golf course and overlooking the Westin Mauna Kea. Its development density is 1.3 units per acre. Sales of 23 units in the first increment began in early 1983, and by the end of the year, all had been sold. At present, three units in the second phase remain unsold. Leasehold prices of the two-bedroom units ranged from \$800,000 to \$1,250,000 and the four-bedroom units from \$1,225,000 to \$1,450,000. The average unit price was slightly over \$1,000,000.

(c) The Shores at Waikoloa Beach Resort

Sales of the 72-unit first increment in the 120-unit fee simple The Shores at Waikoloa Beach Resort began in January 1984. By April 1987, 66 units had been sold.

The project occupies an 11.4-acre fairway site located near the golf clubhouse.

Prices from the current price list range from \$195,000 for a one-bedroom unit to \$680,000 for three-bedroom units. The average price of units in the first increment is about \$350,000.

(d) Mauna Lani Point

This 116-unit project overlooks two of the oceanfront fairways of the Francis H. I'i Brown Golf Course in the Mauna Lani Resort. Its characteristics are similar to those of the Mauna Lani Terrace in terms of density and unit sizes.

Sales began early 1985. Construction was completed about the end of 1986. At present, about one-third of the units had been sold.

Sales prices are higher than original prices at Mauna Lani Terrace due mainly to inflationary effects. The 34 one-bedroom units average \$387,000, the 76 two-bedroom units average \$545,000 and the 6 three-bedroom units average \$835,000.

Resort homes usually develop in proximity to hotels, as return visitors often choose to retire in the locale or to at least acquire property for their own use. Because of their ease of maintenance and relative security, multifamily units have become a very popular means of responding to this type of demand. Although the Westin Mauna Kea has been operating since 1965, no luxury units had been offered for sale in the Kohala Coast Resort Region until 1982.

Thus, pent-up demand existed in the region. In fact, it is our opinion that many of the Mauna Lani Terrace and Villas at Mauna Kea units were

Table VII-1  
 PERCENT OF MULTIFAMILY UNITS  
 IN TOTAL VISITOR PLANT INVENTORY  
 OF SELECTED RESORT REGIONS  
 State of Hawaii  
 1970-1986

|      | West Maui | Kihei-Makena | Kona | North and South Kohala |
|------|-----------|--------------|------|------------------------|
| 1970 | 21%       | 47%          | 1%   | 0%                     |
| 1975 | 42        | 75           | 9    | 5                      |
| 1980 | 48        | 62           | 15   | 11                     |
| 1985 | 56        | 76           | 39   | 9                      |
| 1986 | 54        | 70           | 39   | 12                     |

SOURCE: Hawaii Visitors Bureau, Visitor Plant Inventory; Ming Chew Associates

Table VII-2  
 PERCENT OF MULTIFAMILY UNITS  
 IN TRANSIENT USE  
 OF SELECTED RESORT REGIONS  
 State of Hawaii  
 1970-1986

|      | West Maui | Kihei-Makena | Kona | North and South Kohala |
|------|-----------|--------------|------|------------------------|
| 1970 | 50%       | 98%          | 28%  | 0%                     |
| 1975 | 64        | 47           | 26   | 18                     |
| 1980 | 52        | 44           | 21   | 21                     |
| 1985 | 68        | 59           | 48   | 32                     |
| 1986 | 66        | 53           | 48   | 29                     |

SOURCE: Hawaii Visitors Bureau, Visitor Plant Inventory; Ming Chew Associates

absorbed mainly by pent-up demand generated by the multiple return guests of the Westin Mauna Kea.

2. Multifamily Unit Activity in Other Resort Regions

Due to the limited data on multifamily unit activity in the Kohala Coast Resort Region, market activities and conditions in other resort regions were studied in order to aid in estimating the Kohala Coast market potential. The three other regions investigated were Kona, West Maui (Lahaina to Kapalua) and Kihei-Makena (Maalaea, Kihei, Wailea and Makena).

First, the visitor plant inventory (that is, the inventory of accommodations available to visitors for transient use) in North and South Kohala and the other three resort regions was delineated into hotel units and multifamily units. The results, presented in Table VII-1, show that the proportion of multifamily units in the inventory of transient accommodations has increased steadily in West Maui and Kona. By 1986, this proportion appeared to be approaching an average of 50 percent as an equilibrium level. On the other hand, the proportion of multifamily units in Kihei-Makena was relatively higher in 1970, fluctuated higher to 1985, before dropping slightly in 1986. The composition in Kihei-Makena also appears to be gravitating toward an equilibrium level, although the level may be higher than in Kona or West Maui.

North and South Kohala are just beginning to include multifamily units as a significant part of their inventory of transient accommodations.

Table VII-2 shows the trends in the proportion of multifamily units available for transient accommodations. This proportion has generally ranged between 50 and 70 percent in West Maui. In Kihei-Makena, the proportion has dropped to between 40 and 60 percent, with a trend toward the middle part of the range. The proportion of multifamily units in Kona used for transient accommodations has vacillated, but since 1980, has trended upward and appears to be leveling between 40 and 50 percent. In Kohala, the share of multifamily units in transient use increased rapidly to 1985, before declining slightly in 1986.

B. Projected Demand for Resort Multifamily Units in North and South Kohala

The proportion of multifamily units in the visitor plant inventory and the proportion of total multifamily units used as transient accommodations were projected for North and South Kohala based upon the preceding analyses. These projections were then applied to the projections of total transient accommodations made earlier.

Our analysis indicated that the share of multifamily units trended toward 50 percent for both Kona and West Maui, and we estimated that the visitor plant mix in Kohala would approach about the same level.

However in 1986, the proportion was only 12 percent on the basis of total transient accommodations. We project that the share of multifamily units would increase gradually to 25 percent in 1990, 35 percent in 1995 and 45 percent in 2000. These factors were applied to projected total demand for transient accommodations to delineate the demand for hotel units and multifamily units.

Then, we projected that the proportion of multifamily units used as transient accommodations would increase from about 29 percent in 1986 to 50 percent in 1990, and remain at that level to 2000. That is, we estimate that soon, the number of multifamily units projected to be needed for transient accommodations would be about half of the total multifamily units. Thus, the total projected number of multifamily units would be two times the number needed for transient accommodations. These results are shown in Table VII-3.

The table also shows the projected net demand in excess of the actual 1986 inventory. As seen, we estimate that the market in North and South Kohala is in balance at present. By 1990, we project there would be a net new demand for 1,500 hotel units and 700 multifamily units for transient use over and above the existing 1986 inventory. Thereafter, projected net new demand for both types of transient accommodations would continue to increase.

Table VII-3 FORECAST OF NORTH AND SOUTH KOHALA MULTIFAMILY UNIT DEMAND County of Hawaii 1986-2000

| Gross Demand Forecast   | Delineation of Projected Transient Accommodations Demand |               |             |            | Projected Total MF(1) Units |             |
|-------------------------|----------------------------------------------------------|---------------|-------------|------------|-----------------------------|-------------|
|                         | Total Trans. Units                                       | % Hotel Units | Hotel Units | % MF Units | MF in Trans. Use            | Total Units |
| 1986                    | 1,400                                                    | 88%           | 1,200       | 12%        | 200(2)                      | 600         |
| 1990                    | 3,600                                                    | 75            | 2,700       | 25         | 900                         | 1,800       |
| 1995                    | 5,900                                                    | 65            | 3,800       | 35         | 2,100                       | 4,200       |
| 2000                    | 7,900                                                    | 55            | 4,300       | 45         | 3,600                       | 7,200       |
| Actual Units in 1986(3) | 1,400                                                    |               | 1,200       |            | 200                         | 600         |
| Net Demand Forecast(4)  |                                                          |               |             |            |                             |             |
| 1986                    | 0                                                        |               | 0           |            | 0                           | 0           |
| 1990                    | 2,200                                                    |               | 1,500       |            | 700                         | 1,200       |
| 1995                    | 4,500                                                    |               | 2,600       |            | 1,900                       | 3,600       |
| 2000                    | 6,500                                                    |               | 3,100       |            | 3,400                       | 6,600       |

(1) Multifamily

(2) Rounded

(3) Rounded. Based upon inventory reported in February 1987.

(4) Gross demand forecast, less actual units in 1986.

SOURCE: Ming Chew Associates

Table VII-4

FORECAST OF SOUTH KOHALA RESORT HOTEL AND MULTIFAMILY UNIT DEMAND(1)  
 Kohala Coast Resort Region  
 County of Hawaii, State of Hawaii  
 1990-2000

| Net Increase From 1986 | Projected Transient Accommodations Demand |          | MF(2) Units For Other Uses |          | Total MF Units For Trans. Accom. and Other Uses |
|------------------------|-------------------------------------------|----------|----------------------------|----------|-------------------------------------------------|
|                        | Hotel Units                               | MP Units | Hotel Units                | MP Units |                                                 |
| 1990                   | 450                                       | 300      | 150                        | 150      | 300                                             |
| 1995                   | 900                                       | 500      | 400                        | 400      | 800                                             |
| 2000                   | 1,300                                     | 600      | 700                        | 700      | 1,400                                           |

(1) Estimated to be 20 percent of North and South Kohala Demand.  
 (2) Multifamily

SOURCE: Ming Chew Associates

C. Projected Demand for Multifamily Apartment Units in the Proposed South Kohala Resort

1. Number of Units

Earlier, we estimated that the proposed South Kohala Resort could capture 20 percent of the potential demand for transient accommodations in North and South Kohala. We estimate also that this factor would be applicable for both hotel and multifamily unit demand.

Applying this capture rate to the North and South Kohala demand projections produces the results shown in Table VII-4.

2. Price of Units

Our projections of achievable prices for resort multifamily units in the proposed South Kohala Resort have been based largely on the prices achieved for properties in the three existing resorts. Table VII-5 shows selected characteristics of these projects.

In general, the properties in the Mauna Kea Resort are the lowest in height and density, smallest in number, and largest in area. Even though The Villas is a leasehold project, it is by far the highest in price. Information for The Estates is very preliminary.

Mauna Lani Terrace is a relatively low-density project which fronts a lagoon and old Hawaiian fishpond. It contains eighty units, and has an average density of 6.0 units per acre. The project contains 1-, 2-, and 3-bedroom units with an overall average unit size of 1,800 square feet, including lanais. The overall average fee simple selling price was about \$450,000. Mauna Lani Point contains 116 units and has approximately the same characteristics as Mauna Lani Terrace. This project mostly overlooks oceanfront fairways. Its higher average unit price of \$514,000 generally reflects inflationary effects.

The Shores at Waikoloa Beach Resort occupies a fairway site and will contain 120 1-, 2-, and 3-bedroom units and have an average density of 10.5 units per acre. The overall average size of the units will be about 1,700 square feet and the average fee simple price for units in the first increment will be about \$350,000.



The South Kohala Resort land use concept plan shows multifamily projects only on the golf fairways mauka of the Queen Kaahumanu Highway.

Although the proposed projects fronting the fairways mauka of the Highway will be removed from the ocean and the beach amenities, their higher elevation and rolling terrain will provide these units with very attractive panoramic views of the ocean and coastline. Further, proposed projects in the South Kohala Resort will be part of an integrated resort with a full range of resort amenities available for use. This concept is similar to that of the Mauna Kea Resort. As a result, we estimate that condominium units averaging about 2,000 square feet in area, including lanais, with a recommended overall density of about 4 to 5 units per acre could potentially achieve prices averaging \$500,000 to \$600,000 in fee simple. These prices are higher than for The Shores which has a higher density and less panoramic views. They are about the same as the average for resales at Mauna Lani Terrace, and for Mauna Lani Point, both of which are closer to the ocean, but have a higher density.

In order to maintain an aesthetic, low-density ambience, we recommend also that the structures in the projects mauka of the Queen Kaahumanu Highway be not more than two stories in height.

Table VII-5  
 SELECTED RESORT MULTIFAMILY  
 PROJECT CHARACTERISTICS  
 Kohala Coast Resort Region  
 County of Hawaii, State of Hawaii

| Project                                            | Frontage               | Height             | Density<br>un./ac. | Number<br>of<br>Units | Average<br>Size<br>Sq.Ft.(1) | Average Pri:<br>\$       |
|----------------------------------------------------|------------------------|--------------------|--------------------|-----------------------|------------------------------|--------------------------|
| <u>Mauna Kea<br/>Resort</u>                        |                        |                    |                    |                       |                              |                          |
| The<br>Villas                                      | Golf<br>Fairway        | 1-Story            | 1.3                | 40                    | 4,100                        | \$1,000,000(L:)          |
| The<br>Estates(2)                                  | Golf<br>Fairway        | 1-Story            | 0.5-0.6            | 27-30                 | 4,700                        | not establish:           |
| <u>Mauna Lani<br/>Resort</u>                       |                        |                    |                    |                       |                              |                          |
| Mauna Lani<br>Terrace                              | Lagoon                 | 3-Story            | 6.0                | 80                    | 1,800                        | \$450,000                |
| Mauna Lani<br>Point                                | Ocean/<br>Golf Fairway | 3-Story            | 6.3                | 116                   | 1,750                        | \$514,000                |
| <u>Waikoloa<br/>Beach<br/>Resort</u>               |                        |                    |                    |                       |                              |                          |
| The<br>Shores                                      | Golf<br>Fairway        | 1-, 2-,<br>3-Story | 10.5               | 120                   | 1,700(3)                     | \$350,000(3)             |
| <u>Proposed<br/>South<br/>Kohala<br/>Resort(4)</u> |                        |                    |                    |                       |                              |                          |
| Mauka<br>Projects                                  | Golf<br>Fairway        | 2-Story            | 4-5                | Vari-<br>ous          | 2,000                        | \$500,000 -<br>\$600,000 |

- (LH) - Leasehold  
 (1) Includes lanai and deck areas.  
 (2) Preliminary data.  
 (3) Increment 1 (72 units).  
 (4) Recommended characteristics and potential prices.

SOURCE: Ming Chew Associates

### VIII. MARKET ANALYSIS FOR RESORT SUBDIVISION HOUSELOTS

Resort subdivision houselots are part of the variety of choices available to potential buyers seeking to purchase resort properties. Just as with resort multifamily properties, resort houselots respond to the market demands both for vacation homes and investment properties, and for permanent residences. Moreover houselots may be improved with houses shortly after purchase, or they may be held for many years before being improved. Thus, this segment consists not only of the demand for houselots, but also of the demand for house and lot packages.

#### A. Market Indicators

Currently, the only resort subdivision houselots in the Kohala Coast Resort Region are located in the Mauna Kea Resort, which is adjacent to the proposed South Kohala Resort. They are located in The Fairways at Mauna Kea South which contains 33 lots and The Fairways at Mauna Kea North with 32 lots.

Fairways South consists of lots ranging in size from 10,000 to 15,000 square feet. The lots are surrounded by extensive open area so that the overall density of the project is slightly less than 0.5 lots per acre, or one lot per two overall acres. The lots were offered initially in the early 1970's and have all been sold on a leasehold basis. Over two-thirds of the lots are improved and other homes are being planned. About 25 percent of the homes are occupied full-time.

Fairways North lots contain a minimum of 22,000 square feet. These are clustered, with each cluster surrounded by extensive open space. The project's overall density is about 0.8 lots per acre, or one lot per about 1.2 acres. The leasehold lots were offered for sale beginning in late 1982 for prices ranging from \$175,000 to \$500,000, or an average price of \$365,000. As of early May 1987, only 13 lots remained unsold.

Urban subdivision lots are available in Waikoloa Village several miles from the coastal resorts. Although some lots front the Waikoloa Village Golf Course or have ocean views, these are not considered comparable to the resort subdivision houselots envisioned in the proposed South Kohala Resort.

Two ranch subdivisions have also been completed in the Kohala Coast Resort Region. Both are high-quality masterplanned projects with water, electricity and telephone, in addition to privacy through controlled access. Puakea Bay Ranch began sales about early 1985. The 41 fee simple ten-acre lots, some fronting a private 13.5-acre oceanfront park, sold for an average of \$310,000. Kohala Ranch began sales in early 1986 of 223 lots in Project I, which contains about 1,500 of Kohala Ranch's total 4,000 acres. As of April 1987, about half of the 80 10-acre lots had been sold for an average of \$240,000. More than three-fourths of the 21 5-acre lots sold for an average of \$157,000. And, about half of the 122 3-acre lots had sold for an average of \$128,000. These two ranch subdivisions have equestrian trails, but no resort amenities.

#### B. Projected Demand for Houselots

Our demand analysis has been based mainly upon the general experience of the Mauna Kea Resort, and the results of a study which evaluated the marketability of The Villas and The Fairways at Mauna Kea North.<sup>(1)</sup> As part of the study, persons who had indicated an interest in properties at Mauna Kea were asked what type of property they would be most interested in purchasing. Twenty percent indicated a houselot or a detached house and lot. Eighty percent indicated a multifamily unit. Thus, 25 percent of the number interested in a multi-family unit were interested in a detached-type unit. While the number of buyers in Fairways North is equal to about 50 percent of the number who have purchased multifamily units at Mauna Kea, we believe that the proportion of lot buyers will decrease in the future as the availability of other products increases.

One deterrent to lot buyers is the burden of having to design and build a home. In fact, of the survey respondents indicating an interest in a detached unit, only one-third were interested in buying a lot, and two-thirds were interested in purchasing a "detached

(1) "Marketability and Feasibility Analyses for the Proposed Villas at Mauna Kea and Fairways at Mauna Kea II (now renamed);" Hastings, Martin, Chew & Associates, Ltd.; March 1981.

house and lot." Applying a factor of one-third to the 25 percent, indicates that about 8 percent of those interested in multifamily units might be interested in a resort subdivision houseplot. Rounding this to, say, 10 percent results in the projected demand for South Kohala Resort subdivision houseplots shown in Table VIII-1.

C. Projected Prices for Houseplots

The Fairways North and South have very low densities of 0.5 and 0.8 units per acre, which project an image of exclusivity and privacy. A development density of about 1 unit per acre is recommended for the proposed makai subdivision, and a density of about 2 units per acre is recommended for the mauka subdivisions in the South Kohala Resort. Thus, the proposed subdivision projects, particularly the mauka subdivisions, would be more dense than the existing projects in the Mauna Kea Resort. As such, we believe that achievable houseplot prices in South Kohala Resort will be less.

The makai subdivision is located at about the same elevation and distance from the beach as Fairways North and South. In fact, the site abuts the southern boundary of Fairways South. Its other attributes are also very similar, except for the proposed density, which is about one and one-fourth to two times the densities of the Fairways subdivision. After adjusting for density differences, we estimate that the makai subdivision lots could achieve average prices of between \$300,000 to \$350,000, fee simple.

The proposed mauka subdivisions would be at a higher elevation and about twice the distance from the beach facilities and clubhouse as The Fairways. Development densities recommended for the mauka subdivisions would be almost twice the density of the proposed makai subdivision and about two and one-half to four times those of The Fairways. Although the proposed subdivision lots would overlook fairways of the South Kohala Resort golf course and have broader panoramic views of the ocean and Kohala coastline, they may lack the feeling of being in a very private, high-amenity resort refuge as do the makai properties. For example, the mauka properties would be exposed to more extensive views of the coastline which would include the harbor facilities at Kawaihae. Views would also be distracted by traffic and overhead wires along Queen Kaahumanu Highway.

Table VIII-1

FORECAST OF SOUTH KOHALA RESORT  
SUBDIVISION HOUSELOT DEMAND  
Kohala Coast Resort Region  
County of Hawaii, State of Hawaii  
1990-2000

|      | Projected Total<br>Multifamily<br>Unit Demand(1) | Estimated Ratio<br>of Resort<br>Houselot Demand | Estimated Resort<br>Houselot Demand |
|------|--------------------------------------------------|-------------------------------------------------|-------------------------------------|
| 1990 | 300                                              | 0.1                                             | 30                                  |
| 1995 | 800                                              | 0.1                                             | 80                                  |
| 2000 | 1,400                                            | 0.1                                             | 140                                 |

(1) Increase from 1986.

SOURCE: Ming Chew Associates

We project that mauka lots would have good market reception at average prices ranging from about \$175,000 to \$225,000, fee simple.

D. Projected Demand for House and Lot Packages

We anticipate that a number of prospective buyers will seek pre-designed and pre-constructed houses. These buyers may want customized houses, but prefer to bypass the design and construction phases.

The survey of persons interested in properties at Mauna Kea indicated that twice as many were interested in a detached house and lot" as were interested in a "house-lot." However, as their choice of resort residential properties in the Kohala Coast resorts increases, we estimate that the relative proportion of buyers seeking a house and lot package will decline to approximately the same portion that would purchase houselots alone.

Thus, the projections appearing in Table VIII-1 would also represent, numerically, our demand estimates for house and lot packages. That is, the projected demand for house and lot packages in South Kohala Resort would be 30 houses by 1990, 80 by 1995 and 140 by 2000.

E. Projected Prices for House and Lot Packages

Prices for custom houses in resort areas vary widely since the houses express the individual tastes and preferences of their owners. As such, it is difficult to generalize about prices for house and lot packages.

However, in residential projects with a mix of housing types, we have found that detached houses generally sell for about one-third to one-half more than similar-sized attached multifamily units. We believe that these price differentials were influenced by affordability factors. In the case of the proposed resort properties, we project that personal preference rather than affordability will be the determining factor when choosing a particular type of units. Therefore, the price differential between detached and attached units are likely to be less in South Kohala Resort. With these considerations in mind, we forecast that prices for house and lot packages should be, in general, about one-fourth to one-third more than for similar-sized attached multifamily units.

This would result in estimated average fee simple prices for house and lot packages in The High Bluffs of from \$800,000 to \$1,200,000, and from \$600,000 to \$800,000 in the mauka portion of the resort.

IX. MARKET ANALYSIS FOR GOLF COURSE

The capacity of a golf course is determined by numerous factors, including design and how course operations are managed. The latter item may be based upon the desired image or character of the course. This, in turn is a function of player comfort and pace of play, the course condition and the quality of maintenance without interfering with the enjoyment of play and, how the course relates to associated activities. The character of a course is exemplified by the Mauna Kea golf course which is well-maintained and operated to enhance the exclusive, leisurely and luxurious ambience of the Mauna Kea Resort. In contrast, the character of the municipal Ala Wai Golf Course near Waikiki is one of accommodating as many golfers as possible, as a type of public service.

In many respects, it is the character of a course that determines its capacity.

Also, golf course activity exhibits monthly variations which reflect the seasonal patterns of golfing visitors who arrive mostly during winter months when adverse weather conditions prevent them from playing at home. Variations also occur for different days during the week, caused by local residents playing mostly on weekends due to weekday work schedules. Thus golf course capacity must be considered in the light of weekend and peak season activity.

A. Mauna Kea Golf Course

Since South Kohala Resort is to be a self-contained resort with high-quality amenities similar to those at Mauna Kea Resort, we used the experience of the Mauna Kea golf course to aid in our analysis.

Table IX-1 shows the annual number of rounds from 1978 through 1986. As seen, the number of rounds declined steadily from 1978 through 1982, and then rebounded sharply by 1986. Prior to the change in ownership in 1978, we understand that activity had been relatively steady at slightly over 51,000 rounds per year.

Interestingly, the decline in annual rounds followed almost exactly the decline in the number of westbound visitors intending to visit the Island of Hawaii, except for 1980 and 1981. During these two years, the decline in westbound intended visitors was greater. This suggests that the pattern of play and possibly activity at the hotel were more stable than the

Table IX-1

| Year | Annual Number of Rounds | Annual Rounds Per Room(1) | Average      |
|------|-------------------------|---------------------------|--------------|
|      |                         |                           | Daily Rounds |
| 1978 | 51,100                  | 165                       | 140          |
| 1979 | 47,600                  | 154                       | 130          |
| 1980 | 47,500                  | 153                       | 130          |
| 1981 | 43,700                  | 141                       | 120          |
| 1982 | 38,800                  | 125                       | 106          |
| 1983 | 39,700                  | 128                       | 109          |
| 1984 | 40,300                  | 130                       | 110          |
| 1985 | 47,200                  | 152                       | 129          |
| 1986 | 53,500                  | 173                       | 147          |

(1) At the Westin Mauna Kea

SOURCE: Westin Mauna Kea; Ming Chew Associates

The proposed multifamily units and detached homes would also generate golf activity, but probably not as much as the proposed hotel. Assuming golf activity generated by non-hotel units might be about one-fourth of that generated by hotel units in the type of resort proposed, the non-hotel units would produce a demand of about 8,000 annual rounds of golf. Thus, the total golf demand by 1990 generated at the proposed South Kohala Resort would be for about 43,000 annual rounds.

This amount of activity could not be accommodated at the adjacent Mauna Kea golf course since we estimate it will already be at its desired maximum capacity. In fact, due to general increases in the demand for golf at Mauna Kea, there may be additional increments overflowing to the proposed South Kohala Resort course. Nor do we believe that this amount of demand could be accommodated at the existing courses at Waikoloa or Mauna Lani.

Therefore, in order to support the golf demand generated in the proposed South Kohala Resort by 1990, an associated 18-hole high-quality championship golf course within the resort will be needed by the time the proposed beach hotel begins operations.

Further, we estimate that the demand for golf reach 72,000 annual rounds by 1995 and 128,000 rounds by 2000.

county-wide visitor industry in general in 1980 and 1981. Although the number of westbound visitors intending to visit the Island began increasing in 1982, play at Mauna Kea continued declining. This was due to completion in 1981 of nearby golf courses at both Waikoloa Beach Resort and Mauna Lani Resort. Although both the number of rounds of golf at Mauna Kea and the number of westbound intended visitors have increased since 1982, the number of golf rounds at Mauna Kea has increased more rapidly.

Even though more play was experienced prior to the opening of other resort golf courses on the Kohala Coast in 1981, representatives of Mauna Kea have indicated that for the image and character desired of the golf course, the number of annual golf rounds should not exceed 45,000. Thus, golf play at Mauna Kea reached its maximum desired level in 1985, and exceeded it in 1986.

While playing capacity may be available currently at Waikoloa Beach Resort and Mauna Lani Resort, that capacity will soon be filled as occupancies increase in their associated hotels, and as more accommodations are constructed in each resort.

**B. Proposed South Kohala Resort Golf Course**

As shown in Table VII-4 on page 53, we project a demand for 450 transient accommodation units and 150 multifamily units for other uses, or 600 total units in the proposed South Kohala Resort by 1990.

Due to the golf course reputation developed over a number of years, many guests are at the Mauna Kea Resort largely for golf. Therefore, we believe that the ratio of golf rounds per room at the Resort is unusually high. In fact, we estimate that golf actively generated by the proposed South Kohala Resort hotel might be about one-third less than at Mauna Kea. The desired maximum level of 45,000 per year at Mauna Kea would amount to 145 annual golf rounds per room at the Westin Mauna Kea.

At one-third less golf activity, the proposed South Kohala Resort hotel would generate 100 annual rounds per room. Assuming that the proposed hotel would contain 350 rooms, we estimate that the demand for about 35,000 rounds of golf per year would be generated when the hotel achieves normal operations.

## PROFESSIONAL QUALIFICATIONS OF J. MING CHEW

### BUSINESS BACKGROUND

Principal, Ming Chew Associates, Honolulu, Hawaii  
 Executive Vice President, Hastings, Martin, Chew & Associates, Ltd., Honolulu, Hawaii  
 Senior Economic Consultant, Real Estate Research Corporation, San Francisco, California  
 Economic and Project Analyst, Humble Oil and Refining Company, Baytown, Texas

### EDUCATION

M.B.A. (Economics and Finance) 1967 Stanford University  
 B.S. (Chemical Engineering) 1957 Georgia Institute of Technology

### PROFESSIONAL MEMBERSHIPS

American Real Estate and Urban Economics Association  
 Hawaii Economic Association  
 Pacific Area Travel Association  
 Member, Past-Chairman, Hawaii Visitors Bureau (HVB) Research Committee, Honolulu, Hawaii  
 Member, HVB Long-Range Planning Committee, Honolulu, Hawaii  
 Member, Council on Revenues, State of Hawaii  
 Member, Editorial Board, Tourism Research Publications, University of Hawaii at Manoa  
 Former Member, Pacific Area Travel Association (PATA) Research Authority, San Francisco, California  
 Past President, Hawaii Society of Corporate Planners  
 Former Member, Technical Advisory Committee to the Honolulu City Council Planning and Zoning Committee  
 Former Commissioner, Environmental Quality Commission, State of Hawaii

### TYPICAL CLIENTS

**Financial Institutions**  
 First National Bank of Chicago  
 Pioneer Federal Savings & Loan Association  
 Standard Fidelity Company, Ltd.

**Investors and Investment Groups**  
 Morgan Stanley & Co., Inc.  
 Salomon Brothers  
 Waikhe Heights Associates.

**Government Agencies**  
 U.S. Department of Commerce  
 (Economic Development Administration)  
 U.S. Fish and Wildlife Service  
 U.S. Department of Transportation  
 (United States Department of Administration)  
 State of Hawaii, Department of Planning  
 and Economic Development  
 City and County of Oahu, Department of Transportation Services  
 County of Hawaii  
 County of Kauai Public Housing Agency  
 Marianas Public Land Corporation  
 Maui Redevelopment Agency  
 City of Chicago, Board of Education

**Individuals and Estates**  
 Kamehameha School/Bernice P. Bishop Estate  
 The Estate of James Campbell  
 Arthur Summerfield, Jr.

**Mortgage Bankers/Brokers**  
 Brooks, Harvey & Co., Inc.  
 C.L. Thorle Company, Ltd.

**Builders and Developers**  
 American Tows Corporation  
 Amtek Financial Corporation  
 Ansh Development Corporation  
 Boise Cascade-Waikoloa  
 Cooke Land Company, Inc.  
 Drillingham Land Corporation  
 GO Development Corporation  
 DWA Investment Co.  
 Grove Farm Company, Ltd.  
 Halekalahi Ranch Co.  
 Hawaii Takemaka International, Ltd.  
 Hawaiian Land Company  
 Herbert K. Horita  
 Home Properties, Inc.  
 Sheridan C.F. Ing  
 George Isaac  
 Kalua Koi Corp.  
 Kamehameha Investment Corporation  
 Kapeller Land Company, Inc.  
 Lelehi Pacific  
 Maui Properties, Inc.  
 Maui 100 Properties, Inc.  
 Maui Land and Pineapple Company, Inc.  
 Mauna Kea Properties, Inc.  
 Mauna Kea Resort, Inc.  
 Ohbayashi Hawaii Corporation  
 Pankow Development, Inc.  
 Prineville Development Corporation  
 Prudential Life Insurance Company of America  
 Bruce C. Stark  
 Transcontinental Corporation  
 Wailea Land Corporation  
 John Michael White

### Professional Qualifications - J. Ming Chew

#### Industrial Firms

Dillingham Corporation  
 Lone Star Hawaii, Inc.

#### Other Clients

Aoami & Associates  
 Architects Hawaii  
 Ashford & Wrisson  
 Belt, Collins and Associates  
 Chun, Kerr & Dodd  
 Damon, Key, Char & Bocken  
 Duty Free Shoppers Limited  
 EDAY, Inc.  
 Ezra, O'Connor, Moon & Lawhin  
 Kobayashi, Watanabe, Sugita & Kawashima  
 Kualihui Hospital  
 Walter Lum Associates  
 People for Scenic Growth  
 Real Estate Research Corporation  
 Charles R. Sutton and Associates, Inc.  
 Donald Publitt & Associates, Inc.  
 Winters Smith & Hoosha  
 Wong & Wong Associates, Inc.

### SELECTED STUDIES CONDUCTED

#### Economic and Community Analysis

Economic, Demographic and Selected Land Use Forecast  
 Maui Community Development Plans  
 Economic Projections Element  
 State Tourism Study

#### Economic and Market Analysis

Hilo Community Development and Downtown Plans  
 Market Analysis of Transient Accommodations  
 Development Plan for North and South Kona  
 Economic and Market Analysis  
 Proposed Title VII New Community  
 New Orleans, Louisiana and Atlanta, Georgia

#### Residential

Market and Marketability Analysis  
 Various Condominium and Residential Projects  
 Hawaii, Maui, Oahu  
 Housing Market Development Strategy Study  
 Oahu, Hawaii

#### Comparative Analysis

Selected Hawaii Kai and Waikiki Condominiums  
 Housing Demand Analysis  
 Kukui Redevelopment Area  
 Housing Master Plan for Kauai  
 Kauai, Hawaii  
 Housing and Household Price Analysis  
 Oahu, Hawaii

#### Resort and Recreation

Economic, Market and Marketability Analysis  
 Kapaha, Kailua, Mahalo, Mauna Lani, Princeville,  
 Waikoloa and Waialea Resort Communities  
 Buyer Characteristics and Attitudes  
 Maui Resort Property Owners Survey

#### Market Analysis

Proposed Cultural Park Project, Honolulu, Hawaii  
 Visitor Potential Analysis  
 Proposed Beijing Hotel, People's Republic of China  
 Hotel Market Analysis  
 Hong Kong USA Project, Oakland, California

#### Office

Market, Marketability and Financial Analysis  
 Downtown Honolulu and Non-Downtown  
 Honolulu Office Buildings

#### Marketability and Financial Analysis

Honolulu Condominium Office Building  
 Market Analysis  
 Proposed Linne Office Building

#### Retail

Development Strategy Analysis  
 Ala Moana Commercial Properties  
 Kauai Retail Market Analysis  
 Lahaina Retail Market Analysis  
 Maui, Hawaii  
 Market and Financial Analysis  
 Waikiki Retail and Office Project

#### Industrial

Industrial Market Analysis  
 Oahu, Hawaii  
 Industrial Diversification Potential  
 Kenosha, Wisconsin  
 Manufacturing Plant Location Analysis  
 Los Angeles Area, California  
 Mini-Warehouse Market Analysis  
 Houston, Texas

#### Other Studies

Real Estate Strategy Study  
 Dillingham Corporation  
 Analysis of Household Income Growth  
 Honolulu, Hawaii  
 Analysis of Interest Rate Effects on Ranch Land Marketability  
 Houston, Texas  
 Economic and Social Impact Analysis  
 Downtown Denver Peripheral Parking System  
 Center City Transportation Project  
 (U.S. Department of Transportation)  
 Forecasts of Intra-City Demographic Patterns  
 for School Facilities Planning  
 City of Chicago, Department of Education  
 Analysis of Fuel Shortage Impact on the Hawaii  
 Tourist Industry  
 Market and Feasibility Analysis  
 Proposed Hawaii World Trade Center  
 Aloha Tower Complex, Honolulu, Hawaii  
 Station Area Impact Analysis  
 Honolulu Area Rapid Transit  
 Analysis of Real Estate Market Opportunities  
 Island of Maui, Hawaii  
 Analysis of Proposed Development Plans  
 Oahu, Hawaii  
 Expert Witness  
 Various State Land Use Commission Petitions  
 Various General Plan, Rezoning and  
 Special Management Area Permit Hearings  
 U.S. Bankruptcy Court

**Specializing in research, analysis and counseling to identify Hawaii and Pacific Area real estate opportunities.**

**Professional Services:**

**REGIONAL ECONOMIC ANALYSIS**

Determination of economic, labor and demographic forces creating demands for real estate and land uses.

**TOURISM RESEARCH AND ANALYSIS**

Evaluation of economic development and employment potential of tourism, resort and recreation supply and demand analysis, competitive market strategies and tourism impact analysis.

**REAL ESTATE MARKET AND FEASIBILITY ANALYSIS**

Measurement of real estate supply and demand factors for primary and recreational housing, retail, office and industrial markets.

**REAL ESTATE STRATEGIES**

Identification of ways to profit from real estate market opportunities and means to minimize risks.

**LAND USE POLICY**

Formulation of alternatives supported by economic and market conditions to accomplish public policy goals and objectives regarding land use.

**ECONOMIC AND COMMUNITY IMPACT ANALYSIS**

Estimation of land use demands and community impacts of projects for governmental permit processing.

**DEVELOPMENT AND INVESTMENT COUNSELING**

Interpretation of highest and best use, including selection of synergistic land and space uses and optimum timing.

**EXPERT TESTIMONY**

Qualified expert witness on regional economic issues, real estate markets and marketability, and community and land use impacts.

**REAL ESTATE INVESTMENT PORTFOLIO ANALYSIS**

Selection of investment projects, and responsive mix and timing decisions.



APPENDIX B

A SECOND BASELINE ASSESSMENT  
OF THE MARINE ENVIRONMENT IN THE VICINITY  
OF THE SOUTH KOHALA RESORT,  
SOUTH KOHALA, HAWAII

INTRODUCTION

Coral reefs and other marine environments are often some of the most valuable aesthetic and recreational features of coastal tropical resorts. On the Big Island of Hawaii, the proposed South Kohala Resort will include a 350 room hotel and a beach club on a parcel of land adjacent to the north end of Hapuna Beach (see Figure 1).

Planning for the resort development has focussed on maintaining a high level of environmental quality by addressing the potential for undesirable habitat changes that could result from shoreline development. A marine survey conducted in February of 1984 described the physical and chemical environment, and the biological community structure offshore of the proposed development during a period of typical winter weather. Based on the data collected in this survey it was possible to evaluate the potential susceptibility of the marine environment to man-induced stresses.

Because the 1984 survey was conducted during a period of intense winter storm stress certain aspects of the offshore area, particularly the region close to the shoreline, were impossible to observe. In order to characterize the nearshore area, and to assess the seasonal variability in the surveyed marine environment, a second survey was conducted in the summer of 1987. Weather conditions during this period were in distinct contrast

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MARINE RESEARCH CONSULTANTS



to the initial survey; calm winds and no wave stress. This report presents the results of this survey, along with comparisons of the environment under the two extremes of climatic variability.

#### OBJECTIVES

Specific objectives of the marine surveys are to establish:

- 1) a quantitative baseline to accurately depict the water quality characteristics that could potentially affect biota, and 2) baseline descriptions of community structure of the indigenous marine populations inhabiting the areas listed above. Marine community structure can be defined as the abundance, diversity, and distribution of stony and soft corals, other attached benthic fauna and flora such as algae and sponges, motile benthos such as echinoderms, molluscs, and crustacea, and pelagic species such as reef fish and sea turtles. This information will serve to identify any living marine resources that may be of significant commercial or recreational value, or that represent rare or unique ecological features that may be especially susceptible to human-induced stress.

The most useful biological communities for direct evaluation of environmental impacts are benthic (bottom-dwelling) communities. Because benthos are generally long-lived, immobile, and intimately affected by exogenous input of sediments and other potential pollutants, these organisms must either tolerate the surrounding conditions within the limits of adaptability or die. As members of the benthos, stony corals are of particular

importance in nearshore Hawaiian environments. They contribute a large portion of the reef biomass and their skeletal structures are vital in providing a complex of habitat space, shelter, and food for other species. Since corals serve in such a keystone function, coral community structure is considered the most "relevant" group in the use of reef community structure as a means of evaluating past and potential impacts associated with land development. For this reason, and because alterations in coral communities are easy to identify, observable change in coral population parameters is a practical and direct method for obtaining the information that is required to meet existing environmental regulations.

#### METHODS

All field work for the present survey was conducted on May 27-28, and July 21, 1987. During the first baseline survey in February, 1984, three survey stations were selected between Hapuna Bay to the South and Kaunaoa Bay to the north (see Figure 1). These same stations, numbered 1-3 were resurveyed for water chemistry and community structure in 1987. In addition, because of concern that the marine environment off Hapuna Beach may be affected by resort development, 3 additional stations (numbers 4-6) were surveyed in 1987.

#### Water Chemistry Methods

Water chemistry samples were collected 10, 50, and 150 m from the shoreline along each of the 6 transect lines shown in Figure 1. In addition, 2 ocean control stations located approximately 1 km offshore were sampled. One ocean control was located off the northern end of the development site (Ocean control N), and one was located off the southern end of Hapuna Beach (Ocean control S). The control stations serve to compare water chemistry characteristics within the nearshore area with that of the oceanic environment unaffected by coastal influence.

Water quality parameters evaluated included the thirteen criteria designated for open coastal waters in S11-54-06 of the State of Hawaii Department of Health Water Quality Standards. These include: total Kjeldahl nitrogen, ammonia nitrogen, nitrate + nitrite, orthophosphate phosphorus, total phosphorus, light extinction coefficient, chlorophyll *a*, nephelometric turbidity, and nonfilterable residue (NFR), salinity, dissolved oxygen, temperature and pH.

Water samples for nutrient analysis were collected from 10-15 cm below the surface in 1 liter polyethylene bottles. Within 30 minutes of collection, sub-samples were extracted from the 1 liter bottles by syringe and filtered through glass-fiber filters into 125 ml acid-washed bottles. Each bottle was rinsed with sample water 3 times prior to filling with sample water. Filtered samples were placed on ice and subsequently frozen until analysis. Analysis for ammonium, nitrate + nitrite, and orthophosphate were conducted using standard techniques on a

Technicon Autoanalyzer. Total nitrogen and total phosphorus were analyzed in a similar fashion following persulfate digestion. Kjeldahl nitrogen was calculated as the difference between total nitrogen and nitrate + nitrite. Nutrient analyses were performed by the Analytical Services Laboratory of the Hawaii Institute of Marine Biology.

Turbidity was determined on 60 ml subsamples taken from the 1 liter bottles. Samples were fixed with HgCl<sub>2</sub> to terminate biological activity, and kept refrigerated until turbidity was measured on a Turner Designs Nephelometer (No. 40) and reported in nephelometric turbidity units (NTU). Chlorophyll *a* was measured by filtering 500 ml of water through glass fiber filters; pigments were extracted and assessed fluorometrically. NFR was assessed gravimetrically on the residue of 1 liter of filtered water. Salinity was determined using a AGE Model 2100 laboratory salinometer with a readability of 0.0001 ‰.

Parameters measured in the field included light extinction coefficient, (Li-cor integrating quantum radiometer photometer), dissolved oxygen and temperature (YSI Model 58 meter with a readability of 0.01 mg/l, and 0.1 degree C.), and pH (Cole-Parmer digisense millivolt meter with a readability equivalent to 0.001 pH units).

### Biological Community Analysis

Along each transect 2 quantitative survey sites were selected (see Figure 1). These sites were chosen on the basis of containing relatively large components of coral reef as opposed to sand bottom.

At each survey site a 200 ft long measuring tape was laid out over the reef surface parallel to depth contours. Benthic community structure was estimated by placing a aluminum quadrat frame with dimensions of 1 meter by 2/3 meter over 10 random marks on the survey 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 with knowledge of the taxonomy of resident species visually estimated the percent cover and occurrence of organisms and substrata types within the quadrat frame. Only macrofaunal species greater in size than approximately 2 cm were noted; no attempt was made to identify or enumerate cryptic species dwelling within the reef framework.

Following the period of field work, quadrat photographs were projected onto a grid and units of bottom cover for each species and bottom type calculated. This information was combined with the in-situ cover estimates, and the combined assessment provided the data base for benthic community structure analysis. Species diversity was calculated using the Shannon-Wiener index, and can be equated with the equitability, or dominance, of distribution of the species occurring on each transect.

The practical advantages of photo-transects are numerous: most species can be easily and accurately identified from transparencies, and the photographs provide a permanent record for subsequent time-series comparisons. Also, photo-quadrat sampling is rapid and efficient with respect to time and data collected -- an important consideration when underwater time is restricted by cost, depth and exposure.

Quantitative assessment of reef fish community structure was also conducted in conjunction with the benthic surveys. As the survey tape was laid along the bottom, all fishes observed within a band approximately 3 meters wide along the transect path were identified to species and enumerated. Care was taken to conduct the fish surveys so that disturbance by divers was minimized, ensuring the least possible dispersal of fish. Only readily visible individuals are included in the census. No attempt was made to seek out cryptic species or individuals sheltered within coral.

### RESULTS

#### Water Quality Characteristics

Table 1 shows the various limits specified for the 13 water quality parameters in the Department of Health Water Quality Standards. Table 2 shows the values of these parameters measured at 10 locations off the proposed South Kohala Resort. It can be seen that most of the water chemistry measurements fall within the specified limits set by DOH standards. In addition, there is

relatively little difference between most of the measurements taken on the transects compared to the ocean controls. One exception is nitrate + nitrite ( $\text{NO}_3^- + \text{NO}_2^-$ ), which is substantially higher at the nearshore stations.  $\text{NO}_3^- + \text{NO}_2^-$  is the most abundant species of nitrogen in groundwater, while normally the least abundant in open ocean waters. The high levels of  $\text{NO}_3^- + \text{NO}_2^-$  are a result of groundwater extrusion at the shoreline. Calm sea conditions allowed the formation of a surface lens of lower salinity groundwater that extended some distance offshore. It can be seen that salinity decreases moving offshore and is lower on the transects than at the ocean control stations, while an inverse pattern occurs for  $\text{NO}_3^- + \text{NO}_2^-$ .

All nutrient parameters at Station 4, 10 m offshore were anomalously high. This sampling site was located just off the central region of Hapuna Beach, and the high nutrient concentrations may reflect some beach-related input. Because the anomalously high values do not extend to any of the other sampling sites, it appears that whatever is responsible for the high values is very localized.

Table 3 shows comparisons of chemical parameters that were measured during both the 1984 and 1987 surveys. It can be seen that the only parameter that is substantially different between the two surveys is,  $\text{NO}_3^- + \text{NO}_2^-$ . During the winter survey (1984) high wave action stirred surface waters and obliterated the surface lens of groundwater. It is worth noting that with this one exception, water chemical parameters are very similar between extremes of seasonal conditions.

#### Physiographic Setting

The entire development parcel, which is bordered to the north and south by white sand beaches, is characterized by a basaltic shoreline. The shoreline terminates at the waterline in a shallow sea cliff. During the initial 1984 survey, high surf conditions resulting from large northwest swells prevented examination of the entire shoreline cliff area. Calm weather conditions in 1987 allowed extensive examination of the shoreline area. Plate 1 shows a typical area of underwater shoreline cliff. It can be seen that the cliff is composed of a near-vertical wall that is pocked by boring sea urchins. The sea floor near the shoreline is composed of sand channels, boulder channels, and basalt extrusions. These extrusions create unique topographical features in the form of arches, shallow caves and pillars throughout the study area. These basaltic structures also provide preferred habitat for settlement of attached benthos, and provide shelter for fish and other motile organisms. Plate 2 shows a typical boulder channel containing rounded basaltic rocks, and a basaltic pillar located near the shoreline terminus of transect 2. Direct exposure to long period swells from the north, west and south causes the nearshore area to be limited with respect to colonizing biota, and is relatively barren compared to more sheltered areas.

An exception to this pattern occurs at Transect 6, located at the southern end of Hapuna Bay. This area appears to be sheltered from direct wave stress and is characterized by a well-

developed limestone reef adjacent to the rocky shoreline.

Beyond the shoreline cliff region, the majority of the offshore region is composed of a flat sand plain. Interspersed throughout the area are small patch reefs composed of basaltic and limestone extrusions that are raised above the level of the sand plain. These extrusions provide settling sites for living coral colonies and other attached benthos (see Plates 3 and 4).

Flat areas of bare limestone occur in many areas adjacent to the extrusions (see plates 5 and 6). These limestone areas appear to be former living coral reefs that were killed, probably by excessive sediment scour during winter months.

Farther offshore, the bottom is primarily a flat sand plain. Interspersed on the sand are a series of elongated mounded finger reefs that extend up to three meters off the level of the sand (see Plate 7). These finger reefs are generally oriented perpendicular to the shoreline and may be average 50 to 150 m in length. Examination of the finger reefs indicates that in many cases coral growing on the sides of the reefs are damaged by wave and sediment stress, while the tops corals are relatively healthy. This natural pruning action promotes upward reef growth, but restricts lateral growth resulting in the narrow domed features.

While it was beyond the scope of the present survey to accurately quantify the extent of sand and solid bottom in the offshore region, a reasonable estimate is that 75% of the bottom is covered with sand, while 25% is solid basalt or limestone. This relatively large proportion of sandy bottom cover within the

60 ft. depth contour is atypical of most of the west coast of Hawaii. Most of the coastline off West Hawaii is characterized by a narrow reef zone of basaltic substratum which terminates in a steep dropoff to abyssal depths. The large proportion of sand cover encountered in the present survey is a result of the flat plateau off the development area, and movement of sand between the shoreline beaches at both the north and south borders of the property.

In summary, the physical conditions of the marine environment off the proposed South Kohala Resort property are atypical of the Kohala-Kona nearshore coastline. The typical solid reef platform with high (40-75%) coral cover that extends from the shoreline out to approximately the 60 ft. depth contour is lacking in the South Kohala Resort area. Instead, the nearshore region consists of a sandy expanse interspersed with small narrow fingers of solid substrata. The sand plain appears to be due to the location of the area between two rather large sandy beaches. During periods of high surf activity the water column is turbid owing to resuspension of surface layers of the sandy bottom. During periods of high turbidity the area is a rather unattractive environment for marine recreation, as visibility is restricted to several feet. In addition, during episodes of moderate to heavy surf the nearshore cliff region is dangerous to swimmers and divers owing to the jagged nature of the lava shoreline. On the other hand, when wave activity is minimal, water clarity is high and the nearshore region is a safe and picturesque marine environment.

### Biological Community Structure

#### Coral Community Structure

Table 4 shows percent cover of each coral species, total coral cover, and coral species diversity on each of the 12 photo-transect surveys. Twelve coral species were encountered on transects, and coral cover ranged from about 3 to 58%. Transect locations were selected to traverse regions of maximal coral cover; therefore the estimates of coral cover cannot be extrapolated to represent cover for the entire region. As described in the preceding section only about 25% of the bottom was hard substrata capable of supporting coral growth, while about 75% of the bottom was shifting sand. The regions of hard bottom where corals were found occurred on the shoreline cliff, basaltic extrusions and finger reefs. These structures all elevated off the sea floor, where abrasive force owing to moving sediment is minimized. Plates 3, 4 and 6 show sections of reef elevated off the sand bottom.

While the physiographic structure of the offshore region under study is somewhat atypical of the west coast of Hawaii, vestiges of the zonation pattern of reef corals typical of this coast can be identified offshore of the proposed South Kohala Resort. While the pattern is not as distinct as in other areas, three zones, each characterized by a dominant coral species can be identified.

The zone nearest to shore, including the shoreline cliff and

boulder channels is dominated by the hemispherical branching species Pocillopora meandrina and P. eydouxi. Plates 1 and 3 show areas dominated by sturdy colonies of these species that are capable of withstanding the force of storm waves that prove destructive to other species. Transect 1-10 traversed an area of the Pocillopora zone.

The second, and most abundant zone is dominated by the encrusting species Porites lobata. This species comprises the majority of most reefs in Hawaii, and the finger reefs off the South Kohala Resort are no exception. Plates 4 and 6 show typical reef areas dominated by P. lobata. During the winter survey in 1984, parts of the coral colonies in this zone were observed to be broken and a layer of sediment covered the entire reef surface. While there were abundant areas of limestone originating from dead coral colonies observed during the May 1987 survey, there was no sediment layer on the living corals. Transects 1-15, 2-10, 2-30, 3-10, and 6-20 traversed Porites lobata zones.

The deepest coral zone is dominated by the "finger coral", Porites compressa. This species occurs in interconnected thickets which cover the bottom in areas deep enough to be protected from the destructive force of all but the most intense storm waves. The rapid growth rate of these thickets is sufficient to outcompete other slower growing species for space, resulting in vast monospecific stands (see Plates 7 and 8). Off the proposed development area the deeper areas that contain substantial P. compressa growth consist of elongated finger-

shaped reefs oriented parallel to shore. Transects 1-40, 4-40, 5-50 and 6-40 traversed P. compressa thickets growing on elongated finger reefs. The low species diversity on transect 1-40 reflects the dominance of P. compressa; the higher diversities in the other reef zones indicate the relatively higher equality of distribution of species on the shallow transects.

Transect 5-20 occurred in front of Hapuna Beach in a sandy area that was almost totally devoid of coral. Only several small coral colonies were encountered growing on an isolated section of exposed limestone.

While the three species described above comprise the major components of Hawaii reefs, there are approximately 30 other species that occur on shallow water Hawaiian reefs. The 9 species encountered on the transects comprise a representative sample of these minor species.

#### Other Benthic Invertebrates and Algae

Besides corals, the dominant benthic fauna in the nearshore surge zone were the sea urchins Echinometra mathaei and Echinostrephus aciculatus. These urchins bore into the reef surface and dead coral colonies and give the substrata an irregular pitted appearance (see Plate 1). In some areas of the shoreline cliff and basalt fingers densities of the urchins is on the order of 50 individuals per square meter. Very few other benthic invertebrates occur in the near shore zone owing to the frequent impact of breaking waves and high surge.

Less abundant, but ubiquitous across the entire reef, are the larger species of urchins, Tripneustes gratilla, Echinothrix diadema, and Heterocentrotus mammillatus. Most common of the sea cucumbers are the species Holothuria atra and H. mauritiana, which occur mainly in the P. lobata zone.

Dominant flora in the nearshore region include encrusting coralline algae, primarily of the genera Porolithon and Pyssonellia. These organisms grow on dead limestone structures and the non-living parts of coral colonies. The entire area surveyed was devoid of dominant forms of fleshy macroalgae, as is common along much of the coast of West Hawaii.

The design of the reef survey was such that no cryptic organisms or species living within interstitial spaces of the reef surface were enumerated. Since this is the habitat of the majority of mollusks and crustacea, detailed species counts were not included in the transecting scheme. However, no conspicuous individuals or communities of these classes of biota were observed during the reef surveys at any of the study stations.

None of the assemblages of benthic organisms described above constitutes any unusual or rare community. In addition, none of the algal communities associated with early successional stages of recolonization following denudation of substrate by wave action were observed.

#### Reef Fish Communities

In general, fishes encountered during reef transect surveys



were neither abundant nor diverse compared to other areas of west Hawaii (see Table 5). Relatively few species were encountered, and many of these were represented by only a few individuals. The greatest number of species on a transect was 21, while maximum number of individuals was 97. By comparison, transects off the Mauna Lani Resort, approximately 5 km to the south of the proposed South Kohala Resort averaged about 40 species, and 300 to 500 individuals.

The most abundant species encountered in the present survey were the fan-tailed filefish, Pervagor epilosoma, the saddleback wrasse, Thalassoma duperreyi, and the surgeonfishes, Acanthurus nigrofuscus and Ctenochaetus strigosus. The depauperate fish fauna is largely a consequence of the scarcity of good habitat in the area. Large expanses of sand offers little refuge for reef fishes, as does much of the flat limestone bottom. Sites with rich coral growth were inhabited by well-developed fish communities, but such areas were rare.

Shallow areas proximal to the shoreline cliff exhibited the richest fish fauna. The bottom near the shoreline tended to be more irregular with numerous rocky ledges, spurs and caves. Several large parrotfish and surgeonfish were seen in this habitat. Also observed was a large school of small omilu, Caranx melampygus, and a single manta ray. The caves were inhabited by fair numbers of a holehole, Kuhlia sandvicensis, aweoweo, Heteropriacanthus cruentatus, and small menpachi, Myripristis amaena.

Also noted was a relative scarcity of fish of adequate size to constitute "food fish". Owing to the proximity to beaches and

shore access, the area appears to be subjected to substantial fishing pressure.

#### Threatened or Endangered 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 along the Kona Coast, and is known to feed on selected species of macroalgae. The endangered hawksbill turtle (Eretmochelys imbricata) is known infrequently from waters off the Kohala Coast. No turtles were observed during the present study off the proposed development site, although they undoubtedly occur in the area.

The portion of the development area that consists of cliffed and rocky shoreline cannot be considered as suitable for turtle nesting sites. Sandy beaches, located to the north and south of the proposed development that constitute potential turtle nesting grounds are presently used heavily by humans. Therefore, any impacts to turtle breeding and behavior have probably already occurred.

Populations of the endangered humpback whale (Megaptera novaeangliae) are known to winter in the Hawaiian Islands and frequent the Kohala Coast. In general, however, it is not common for whales to occupy the shallow nearshore areas that are the major focus of this survey.

## CONCLUSIONS

The second survey of the proposed South Kohala Resort adds to the information of the original survey to provide a comprehensive picture of the coastal marine environment. The most significant conclusion derived from the winter 1984 survey was that the area represents one of the most physically stressed and sub-optimal (with respect to reef-associated marine biota) regions on the entire west coast of Hawaii. During a period of moderate swell, water conditions were extremely turbid. These turbid conditions, in combination with the dominance of sandy substratum, result in sub-optimal environmental conditions in terms of aesthetics, recreational potential and biological community structure.

During the summer months, when swell activity is minimal, environmental conditions "improve". Water clarity is equal to neighboring areas that do not possess the high proportion of sandy substratum. Biological communities remain depauperate compared to areas with more complex solid substratum. When it is accessible, however, the shoreline region does afford enjoyable snorkeling and diving conditions.

Nearshore water chemistry is characterized by a low salinity-high nitrate surface lens originating from groundwater extrusion. During winter conditions high rates of mixing from waves and winds obliterate the surface lens. In general, water quality can be considered pristine, but does indicate that there are localized effects from Hapuna Beach.

## Potential Impacts

The ultimate purpose of baseline surveys is to estimate the potential for impact to environments from shoreline development. Implementation of the proposed action would involve grading, vegetation removal, new construction and other changes to the existing environment on land. There are currently no plans, however, for direct modification of the shoreline for any purpose. Therefore, any potential impacts to the aquatic environments must be considered as indirect processes that come about as results of activities on land.

With regard to the aquatic resources, the major potential indirect impact parameters appear to be: 1) increased sedimentation from wind or runoff as a consequence of grading, 2) changes in groundwater discharge and surface runoff, especially with respect to nutrients from sewage effluent used for irrigation and golf course fertilization, and 3) possible impacts from herbicides and pesticides.

## Sediment Loading

A potential cause of impact to the marine environment resulting from nearshore development is increased sediment loading. During construction exposed land can cause increases in wind-borne dust and suspended particulate runoff that could reach the ocean. The magnitude of dust generation is expected to be low because of the low soil cover of the area. Likewise, for several reasons it is not expected that runoff during

construction would increase oceanic sediment loads. The climate of the Kohala district is one of the driest in the Hawaiian Islands; therefore substantial rainfall during construction is rather unlikely. However, in the event of heavy rainfall, the porous nature of the lava and soil ground cover is such that sheet flow carrying suspended sediment toward the ocean is unlikely. Rather, most rainwater that would enter the ocean as runoff would do so following percolation through the surface rock layers to the water table, followed by groundwater extrusion at the shoreline. Such groundwater flow would not have the effect of transporting sediment to the ocean since the basal rock acts as a filter.

Even if land-derived sediment input owing to construction did increase, there is little reason to expect any changes in marine water chemistry and biotic community structure. Corals and other reef organisms are capable of removing sediment suspended by natural phenomena up to threshold levels of deposition where cleaning mechanisms are overwhelmed and organisms become buried.

The marine community offshore of the proposed South Kohala Resort is presently subjected to extremes in sediment stress from natural conditions. This type of stress results in an relatively depauperate biota because very few macro-organisms are adapted to inhabit shifting sand environments. The range of natural conditions of sea and swell result in the frequent suspension of large amounts of sediment in the water column. The majority of corals that occur in the area are growing on structures raised off the bottom in order to minimize abrasion

from shifting sands. These organisms are therefore capable of withstanding the stress associated with large natural sediment loads. In comparison to the frequent natural sediment loading within the study area, any additional input from land resulting from construction activity would be insignificant. The communities that occur at the present time are subjected to such a high level of natural stress that they would undoubtedly be unaffected by any additional minor input from land-based development.

#### Groundwater Changes

Normal volumes of groundwater extrusion in South Kohala range in the neighborhood of 5-6 mgd per mile, and has been shown to cause a surface lens during periods of calm weather. The increase to the volume of groundwater extrusion, and resulting change in water chemistry owing to changes in shoreline characteristics is likely to be insignificant. For a much larger development on the Kona coast at Waikoloa, it was estimated that the annual discharge of stormwater runoff is roughly equivalent to the amount of groundwater which enters the ocean each day (U. S. Army Corps of Engineers 1985).

If the South Kohala Resort plans to irrigate and fertilize golf courses with treated sewage effluent, the potential for impacts to the aquatic ecosystems owing to high rates of nutrient loading must be considered. When subjected to substantial increases in nutrients, the response of some marine and freshwater systems is termed "eutrophication", and consists of

increased growth of a portion of the community that is able to directly utilize the nutrients, generally at the expense of normal community integrity. The overall result of this process is usually a degradation of environmental quality.

At the proposed South Kohala Resort, it is anticipated that no such impacts will occur for several reasons. Most importantly, the unrestricted circulation of the offshore zone by tides, current, meso-scale eddies, wind, and wave action promotes rapid dilution and water exchange. Residence time of a parcel of water fronting the development is probably on the order of hours. Any dissolved nutrients reaching the nearshore area will be rapidly diluted by normal oceanic processes, so buildup of any nutrient materials is unlikely.

Another reason that the marine environment will probably show no effects as a result of golf course irrigation is that much of the nutrient load is taken up by the vegetation on the golf course. Chang and Young (1977) report that on a golf course on Oahu irrigated with treated sewage effluent 98% of the total nitrogen and 100% of the total phosphorus was taken up by the soil-plant surface layer. Chemical processes that account for the uptake include incorporation into plant biomass, cation exchange, fixation and adsorption on the soil, biological oxidation and denitrification. The important aspect of the study conducted on the Oahu golf course is that essentially none of the nutrient load reaches the marine environment through groundwater runoff. While it may be argued that the underlying substrata differs between the Oahu course studied by Chang and Young and West Hawaii, the relevant point is that most, or all, of the

dissolved nutrients were taken up by the soil-plant mantle of the golf course and not the underlying soil.

Another factor that accounts for the lack of potential for impact is the secondary level of sewage treatment commonly used by resort developments for irrigants and fertilizers. Studies of several of the municipal ocean discharges on Oahu (Dollar 1986, 1987 Russo et al. 1980) and Hawaii (Dollar 1985) that intentionally discharge much greater volumes of secondary sewage into marine environments indicate there are no detrimental effects resulting from the discharge, and no evidence of any "pollution". In fact, the impacts that have been reported can be considered beneficial since they result in increased fish and coral populations. Fish populations appear to increase in response to increased particulate food and shelter, while corals find desirable settling sites on the outfall structure. The consistent conclusion from these outfall studies is that as long as the effluent is treated to a secondary level which removes larger particulate fractions, and the receiving environment is an area of unrestricted circulation, the potential for detrimental effects is nil.

Based on these observations, it is probable that even if malfunctions in resort sewage plants result in discharge directly into the ocean (in the same manner as the municipal discharges), there will be little or no effect to water quality or biotic communities.

A final, and perhaps most important consideration with regard to effects from irrigants is the relatively high levels of

nitrogen presently entering the marine environment through groundwater extrusion. Results of the present survey reveal that there is a surface lens of high nitrogen water near the shoreline. Detectable increases to this range of groundwater percolation are likely to be indistinguishable. Murdoch and Green (1987) showed that dissolved nitrogen concentrations in water fronting the Westin Mauna Kea golf course were no different than control sites after 23 years of golf course operation. Even is detectable amounts of nutrient materials did reach the ocean on a continual basis, it is unlikely that there would be any negative effects to the marine community. Because of the high initial concentration of nutrients in the nearshore region from groundwater, the reef communities in West Hawaii are considered pre-adapted to relatively high oceanic levels of nitrogen.

#### Pesticides and Herbicides

Potential for negative alteration to marine ecosystems owing to pesticides and herbicides also seems to be nil. It has not been found necessary to utilize substantial quantities of pesticides on golf courses in Hawaii, and only very small applications of herbicides are periodically made to the greens (N. Bustamente, Mauna Lani Resort, personal communication). Such small quantities do not appear to be of a magnitude great enough to leach through the soil and lava, be carried to the ocean via groundwater extrusions, and then bioaccumulate to the point of producing a noticeable effect.

#### Protected Species

As mentioned in the Results, there are several protected marine species that may inhabit the offshore environment. Because there are no plans for modification of the shoreline, potential impacts to marine mammals and turtles are negligible. Heavy equipment used in construction might produce noise that could be heard by whales. A literature review conducted by Darby-Ebisu & Associates (1984) for the Waikoloa Beach Resort EIS indicated that this kind of low-level noise would have no apparent adverse effects on major marine animals, and would not cause avoidance of the area.

Short term changes in water quality resulting from construction would also not be of a magnitude to affect the behavior of sea turtles that might inhabit the area. Because access to the shoreline is presently unrestricted through the Westin Mauna Kea and Hapuna Beach, any human-induced effects to turtle populations has probably already occurred. The potential for additional impact must be considered very slight.

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FIGURE 1. Map showing location of proposed South Kohala Resort between Hapuna Beach and the Westin Mauna Kea. Transects are labeled T-1 through T-6. Photo-quadrat and fish count sites are marked by transect number and depth (example: station 1-15 is on transect 1 at the 15 foot depth. Location of control stations is not to scale; these stations are approximately 1 kilometer offshore.

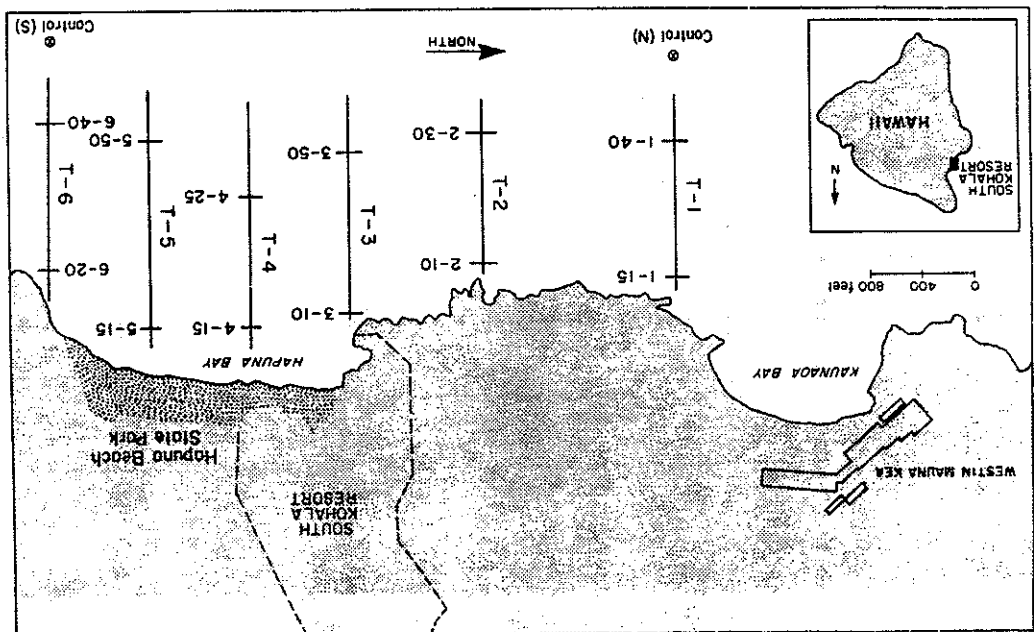


TABLE 1. Specific criteria specified by DOH water quality standards for open coastal waters

| Parameter                                 | Geometric mean not to exceed the given value | Not to exceed more than 10% of the time | Not to exceed the given value |
|-------------------------------------------|----------------------------------------------|-----------------------------------------|-------------------------------|
| Total Kjeldahl Nitrogen (ug N/l)          | 150.00M                                      | 250.00M                                 | 350.00M                       |
| Ammonia Nitrogen (ug NH4-N/l)             | 110.00M                                      | 180.00M                                 | 250.00M                       |
| Nitrate + Nitrite (ug NH4-N/l)            | 3.50M                                        | 8.50M                                   | 15.00M                        |
| Nitrate (ug NH4-N/l)                      | 2.50M                                        | 5.00M                                   | 9.00M                         |
| Nitrite (ug NH4-N/l)                      | 5.00M                                        | 14.00M                                  | 25.00M                        |
| Orthophosphate (ug PO4-P/l)               | 3.50M                                        | 10.00M                                  | 20.00M                        |
| Total Phosphorus (ug P/l)                 | 7.00M                                        | 12.00M                                  | 17.00M                        |
| Light Extinction Coefficient (k units)    | 5.00M                                        | 9.00M                                   | 13.00M                        |
| Turbidity (Nephelometric Turbidity Units) | 20.00M                                       | 40.00M                                  | 60.00M                        |
| Chlorophyll a (ug/l)                      | 16.00M                                       | 30.00M                                  | 45.00M                        |
| Nonfilterable Residue (mg/l)              | 0.20M                                        | 0.50M                                   | 0.85M                         |
|                                           | 0.10M                                        | 0.30M                                   | 0.55M                         |
|                                           | 0.30M                                        | 0.90M                                   | 1.75M                         |
|                                           | 0.15M                                        | 0.50M                                   | 1.00M                         |
|                                           | 0.50M                                        | 1.25M                                   | 2.00M                         |
|                                           | 0.20M                                        | 0.50M                                   | 1.00M                         |
|                                           | 20.0M                                        | 30.0M                                   | 40.0M                         |
|                                           | 10.0M                                        | 15.0M                                   | 20.0M                         |

"Net" criteria apply when the open coastal waters receive more than three million gallons per day of fresh water discharge per shoreline mile. "Dry" criteria apply when the open coastal waters receive less than three million gallons per day of fresh water discharge per shoreline mile.

Applicable to both wet and dry conditions:

pH units shall not deviate more than 0.5 units from a value of 8.1.

Dissolved oxygen - Not less than 75% saturation.

Temperature - Shall not vary more than 1 deg. C from ambient conditions.

Salinity - Shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

TABLE 2 (cont.)

| TRANSECT      | DISTANCE FROM SHORE (M) | NON-FILTERABLE RESIDUE (mg/L) | DISSOLVED OXYGEN (% sat.) | DISSOLVED OXYGEN (mg/L) | SALINITY (ppt) | pH    | TEMPERATURE (deg. C) |
|---------------|-------------------------|-------------------------------|---------------------------|-------------------------|----------------|-------|----------------------|
| 1             | 10                      | 2.2                           | 102.8                     | 6.84                    | 33.915         | 8.112 | 26.0                 |
|               | 50                      | 1.6                           | 95.1                      | 6.33                    | 34.207         | 8.098 | 25.6                 |
|               | 150                     | 9.5                           | 92.6                      | 6.21                    | 34.536         | 8.099 | 25.7                 |
| 2             | 10                      | 4.2                           | 95.5                      | 6.37                    | 33.660         | 8.113 | 25.7                 |
|               | 50                      | 2.3                           | 94.0                      | 6.26                    | 33.746         | 8.113 | 25.7                 |
|               | 150                     | 1.8                           | 94.5                      | 6.32                    | 34.329         | 8.098 | 25.6                 |
| 3             | 10                      | 2.7                           | 95.4                      | 6.38                    | 31.121         | 8.114 | 25.6                 |
|               | 50                      | 13.3                          | 94.5                      | 6.32                    | 32.334         | 8.113 | 25.8                 |
|               | 150                     | 3.1                           | 94.5                      | 6.31                    | 33.178         | 8.113 | 25.8                 |
| 4             | 10                      | 5.9                           | 95.6                      | 6.4                     | 33.717         | 8.113 | 26.0                 |
|               | 50                      | 5.9                           | 95.1                      | 6.33                    | 34.390         | 8.114 | 25.8                 |
|               | 150                     | 3.9                           | 95.0                      | 6.30                    | 34.536         | 8.113 | 25.6                 |
| 5             | 10                      | 6.7                           | 101.1                     | 6.78                    | 33.589         | 8.112 | 25.7                 |
|               | 50                      | 7.8                           | 95.6                      | 6.38                    | 34.438         | 8.114 | 25.7                 |
|               | 150                     | 4.2                           | 94.7                      | 6.35                    | 34.506         | 8.115 | 25.4                 |
| 6             | 10                      | 3.5                           | 99.0                      | 6.71                    | 33.648         | 8.110 | 25.7                 |
|               | 50                      | 4.8                           | 95.5                      | 6.37                    | 34.223         | 8.112 | 25.6                 |
|               | 150                     | 4.4                           | 95.6                      | 6.38                    | 34.503         | 8.122 | 25.6                 |
| OCEAN CTL (N) | 1500                    | 2.4                           | 93.9                      | 6.36                    | 34.746         | 8.098 | 25.9                 |
| OCEAN CTL (S) | 1500                    | 2.2                           | 94.1                      | 6.38                    | 34.574         | 8.116 | 25.8                 |

Water chemistry parameters measured at stations offshore of proposed South Kohala Resort. In locations, see Figure 1.

| DISTANCE FROM SHORE (M) | TOTAL KjELDAHL NITROGEN |          | AMMONIA NITROGEN |          | NITRATE + NITRITE NITROGEN |          | ORTHO-PHOSPHATE PHOSPHORUS |          | TOTAL PHOSPHORUS |          | LIGHT EXTINCTION COEFFICIENT (k units) | CHLOROPHYLL a (ug/L) | TURBIDITY (Nephelometric turbidity units) |
|-------------------------|-------------------------|----------|------------------|----------|----------------------------|----------|----------------------------|----------|------------------|----------|----------------------------------------|----------------------|-------------------------------------------|
|                         | (uM)                    | (ug N/L) | (uM)             | (ug N/L) | (uM)                       | (ug N/L) | (uM)                       | (ug P/L) | (uM)             | (ug P/L) |                                        |                      |                                           |
| 10                      | 5.93                    | 83.02    | 0.12             | 1.68     | 1.43                       | 20.02    | 0.14                       | 4.34     | 0.52             | 16.12    | 0.13                                   | 1.00                 | 0.39                                      |
| 50                      | 14.82                   | 207.48   | 0.08             | 1.12     | 1.30                       | 18.20    | 0.12                       | 3.72     | 0.50             | 15.50    | 0.11                                   | 0.71                 | 0.24                                      |
| 150                     | 6.27                    | 87.78    | 0.10             | 1.40     | 0.65                       | 9.10     | 0.11                       | 3.41     | 0.57             | 17.67    | 0.12                                   | 0.68                 | 0.23                                      |
| 10                      | 6.44                    | 90.16    | 0.17             | 2.38     | 2.59                       | 36.26    | 0.19                       | 5.89     | 0.67             | 20.77    | 0.06                                   | 0.28                 | 0.36                                      |
| 50                      | 6.97                    | 97.58    | 0.31             | 4.34     | 2.88                       | 40.32    | 0.19                       | 5.89     | 0.53             | 16.43    | 0.08                                   | 0.94                 | 0.20                                      |
| 150                     | 5.75                    | 80.50    | 0.01             | 0.11     | 0.94                       | 13.16    | 0.10                       | 3.10     | 0.49             | 15.19    | 0.09                                   | 2.30                 | 0.20                                      |
| 10                      | 6.53                    | 91.42    | 0.17             | 2.38     | 9.23                       | 129.22   | 0.32                       | 9.92     | 0.64             | 19.84    | 0.10                                   | 0.32                 | 0.25                                      |
| 50                      | 5.25                    | 73.50    | 0.08             | 1.12     | 6.78                       | 94.92    | 0.24                       | 7.44     | 0.57             | 17.67    | 0.10                                   | 0.49                 | 0.22                                      |
| 150                     | 5.69                    | 79.66    | 0.03             | 0.42     | 3.94                       | 55.16    | 0.19                       | 5.89     | 0.57             | 17.67    | 0.06                                   | 0.98                 | 0.29                                      |
| 10                      | 20.68                   | 289.52   | 4.44             | 62.16    | 1.98                       | 27.72    | 2.05                       | 63.55    | 2.49             | 77.19    | 0.10                                   | 1.01                 | 0.75                                      |
| 50                      | 6.56                    | 91.84    | 0.32             | 4.48     | 0.26                       | 3.64     | 0.15                       | 4.65     | 0.48             | 14.88    | 0.09                                   | 0.97                 | 0.40                                      |
| 150                     | 5.77                    | 80.78    | 0.30             | 4.20     | 0.05                       | 0.70     | 0.16                       | 4.96     | 0.57             | 17.67    | 0.08                                   | 0.65                 | 0.27                                      |
| 10                      | 5.25                    | 73.50    | 0.35             | 4.90     | 1.91                       | 26.74    | 0.20                       | 6.20     | 0.48             | 14.88    | 0.11                                   | 2.97                 | 0.42                                      |
| 50                      | 9.52                    | 133.28   | 1.74             | 24.36    | 0.21                       | 2.94     | 0.37                       | 11.47    | 0.75             | 23.25    | 0.10                                   | 1.63                 | 0.32                                      |
| 150                     | 5.77                    | 80.78    | 0.30             | 4.20     | 0.08                       | 1.12     | 0.16                       | 4.96     | 0.52             | 16.12    | 0.10                                   | 0.24                 | 0.18                                      |
| 10                      | 5.75                    | 80.50    | 0.46             | 6.44     | 2.14                       | 29.96    | 0.22                       | 6.82     | 0.53             | 16.43    | 0.11                                   | 0.74                 | 0.54                                      |
| 50                      | 5.77                    | 80.78    | 0.42             | 5.88     | 0.32                       | 4.48     | 0.15                       | 4.65     | 0.51             | 15.81    | 0.09                                   | 1.74                 | 0.26                                      |
| 150                     | 5.67                    | 79.38    | 0.30             | 4.20     | 0.11                       | 1.54     | 0.15                       | 4.65     | 0.52             | 16.12    | 0.09                                   | 0.59                 | 0.25                                      |
| 1500                    | 6.44                    | 90.16    | 0.05             | 0.70     | 0.10                       | 1.40     | 0.10                       | 3.10     | 0.52             | 16.12    | 0.08                                   | 0.45                 | 0.23                                      |
| 1500                    | 5.79                    | 81.06    | 0.30             | 4.20     | 0.05                       | 0.70     | 0.20                       | 6.20     | 0.51             | 15.81    | 0.08                                   | 1.11                 | 0.31                                      |



E 3. Comparison of water quality parameters measured in March, 1984, and June 1987 offshore of proposed South Kohala Resort. For Station locations see Figure 1.

| STATION       | DISTANCE FROM SHORE (m) | AMMONIA NITROGEN (uM) |      | NITRATE + NITRITE NITROGEN (uM) |      | ORTHO-PHOSPHATE PHOSPHORUS (uM) |      | CHLOROPHYLL a (ug/L) |      | NON-FILTERABLE RESIDUE (mg/L) |      | DISSOLVED OXYGEN (mg/L) |      | SALINITY (ppt) |       |
|---------------|-------------------------|-----------------------|------|---------------------------------|------|---------------------------------|------|----------------------|------|-------------------------------|------|-------------------------|------|----------------|-------|
|               |                         | 1987                  | 1984 | 1987                            | 1984 | 1987                            | 1984 | 1987                 | 1984 | 1987                          | 1984 | 1987                    | 1984 | 1987           | 1984  |
| 1             | 10                      | 0.12                  | 0.09 | 1.43                            | 0.21 | 0.14                            | 0.13 | 1.00                 | 0.52 | 2.20                          | 2.77 | 6.84                    | 6.90 | 33.91          | 32.00 |
|               | 50                      | 0.08                  | 0.10 | 1.30                            | 0.49 | 0.12                            | 0.18 | 0.71                 | 0.40 | 1.60                          | 0.31 | 6.33                    | 6.70 | 34.21          | 32.80 |
|               | 150                     | 0.10                  | 0.05 | 0.65                            | 0.18 | 0.11                            | 0.15 | 0.68                 | 0.32 | 9.50                          | 0.00 | 6.21                    | 6.80 | 34.54          | 32.00 |
| 2             | 10                      | 0.17                  | 0.18 | 2.59                            | 0.17 | 0.19                            | 0.13 | 0.28                 | 0.45 | 4.20                          | 2.27 | 6.37                    | 6.80 | 33.66          | 32.50 |
|               | 50                      | 0.31                  | 0.21 | 2.88                            | 0.45 | 0.19                            | 0.18 | 0.94                 | 0.33 | 2.30                          | 0.55 | 6.26                    | 6.90 | 33.75          | 32.10 |
|               | 150                     | 0.01                  | 0.10 | 0.94                            | 0.36 | 0.10                            | 0.15 | 2.30                 | 0.47 | 1.80                          | 0.41 | 6.32                    | 6.50 | 34.33          | 32.00 |
| 3             | 10                      | 0.17                  | 0.29 | 9.23                            | 0.43 | 0.32                            | 0.16 | 0.32                 | 0.38 | 2.70                          | 0.90 | 6.38                    | 6.50 | 31.12          | 32.10 |
|               | 50                      | 0.08                  | 0.32 | 6.78                            | 0.36 | 0.24                            | 0.17 | 0.49                 | 0.32 | 13.30                         | 0.34 | 6.32                    | 6.80 | 32.33          | 32.00 |
|               | 150                     | 0.03                  | 0.13 | 3.94                            | 0.02 | 0.19                            | 0.09 | 0.98                 | 0.41 | 3.10                          | 0.71 | 6.31                    | 6.50 | 33.18          | 32.00 |
| OCEAN CONTROL | 1500                    | 0.05                  | 0.03 | 0.10                            | 0.01 | 0.10                            | 0.05 | 0.45                 | 0.34 | 2.40                          | 0.00 | 6.36                    | 6.70 | 34.75          | 32.00 |

TABLE 4. Percent cover of each coral species and non-coral substrate on transects in the vicinity of South Kohala Resort. See Figure 1 for transect locations.

| CORAL SPECIES                                | TRANSECT DEPTH |       | 1     |       | 2     |       | 3     |       | 4     |       | 5     |       | 6 |   |
|----------------------------------------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|---|
|                                              | 15             | 40    | 10    | 30    | 10    | 30    | 25    | 40    | 20    | 50    | 20    | 40    |   |   |
| <u>Porites lobata</u>                        | 21.0           | 13.4  | 27.8  | 7.5   | 7.5   | 13.5  | 14.0  | 10.4  | 2.1   | 9.7   | 37.7  | 29.2  |   |   |
| <u>Porites compressa</u>                     | 1.0            | 44.0  | 0.7   | 0.8   | 1.2   | 2.0   | 0.4   | 14.2  |       | 18.1  | 0.3   | 32.2  |   |   |
| <u>Porites brighani</u>                      |                |       |       |       |       |       | 2.3   |       |       |       |       |       |   |   |
| <u>Porites (Solenastrea) convexa</u>         |                |       |       |       | 0.2   |       |       |       |       |       |       |       |   |   |
| <u>Pocillopora meandrina</u>                 | 3.9            | 0.2   | 0.5   |       | 2.2   | 0.1   | 0.1   | 0.1   | 0.2   | 0.1   | 4.4   | 0.4   |   |   |
| <u>Pocillopora eudouxi</u>                   |                |       | 2.1   |       | 2.1   |       |       |       |       |       |       | 0.5   |   |   |
| <u>Montipora verrucosa</u>                   | 5.8            | 0.5   | 5.3   | 1.5   | 2.0   | 0.6   | 2.2   | 0.4   | 0.1   | 0.9   | 3.3   | 2.6   |   |   |
| <u>Montipora setula</u>                      | 0.6            |       | 1.5   |       | 0.1   |       |       |       | 0.1   | 0.3   | 3.7   | 0.2   |   |   |
| <u>Pavona varians</u>                        |                |       | 0.4   |       | 0.1   |       |       |       |       |       |       | 0.5   |   |   |
| <u>Pavona (Pseudocolumnastrea) pollicata</u> |                |       |       |       | 0.2   |       |       |       |       |       |       |       |   |   |
| <u>Leptastrea purpurea</u>                   | 0.1            |       |       |       |       |       |       |       |       |       |       | 0.2   |   |   |
| <u>Paluthea tuberculosa</u>                  |                |       |       |       | 0.4   |       |       |       |       |       | 1.7   | 0.1   |   |   |
| NON-CORAL BOTTOM COVER                       |                |       |       |       |       |       |       |       |       |       |       |       |   |   |
| Limestone                                    | 47.6           | 1.9   | 56.1  | 11.6  | 14.0  | 34.0  | 61.2  |       | 0.5   | 1.6   | 24.4  | 26.3  |   |   |
| Sand                                         | 20.0           | 40.0  | 5.6   | 78.6  | 70.0  | 49.8  | 22.1  | 74.9  | 97.0  | 69.3  | 6.0   | 8.3   |   |   |
| Basalt                                       |                |       |       |       |       |       |       |       |       |       | 18.0  |       |   |   |
| NUMBER OF CORAL SPECIES                      |                |       | 6     | 5     | 7     | 3     | 10    | 5     | 4     | 4     | 4     | 5     | 7 | 8 |
| PERCENT CORAL COVER                          | 32.4           | 58.1  | 38.3  | 9.8   | 16.0  | 18.5  | 16.7  | 25.1  | 2.5   | 29.1  | 51.6  | 65.4  |   |   |
| CORAL SPECIES DIVERSITY                      | 1.043          | 0.609 | 0.970 | 0.697 | 1.614 | 0.469 | 0.180 | 0.775 | 0.606 | 0.836 | 0.991 | 0.950 |   |   |

TABLE 5. Reef fish community abundance on transect surveys of South Kohala Resort Resort offshore area. See Figure 1 for location of survey sites.

| FISH SPECIES                       | TRANSECT NUMBER |   |    |   |    |   |   |   |   |    |    |    | TOTAL |
|------------------------------------|-----------------|---|----|---|----|---|---|---|---|----|----|----|-------|
|                                    | 1               | 2 | 3  | 4 | 5  | 6 | 7 | 8 | 9 | 10 | 11 | 12 |       |
| <b>CIRRHITIDAE</b>                 |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Paracirrhites arcatus</i>       | 1               | 2 | 2  | 1 | 1  | 1 |   |   |   |    |    |    | 7     |
| <i>P. fosteri</i>                  | 1               |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <b>MULLIDAE</b>                    |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Mullotichthys flavolineatus</i> | 1               | 3 |    |   |    |   |   |   |   |    |    |    | 4     |
| <i>M. vancouverensis</i>           |                 |   | 1  |   |    |   |   |   |   |    |    |    | 1     |
| <i>Parupeneus pleurostigma</i>     | 1               |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>P. multifasciatus</i>           | 8               | 4 | 2  | 2 | 3  | 1 | 1 | 1 |   |    |    |    | 22    |
| <i>P. cyclostomus</i>              | 1               |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <b>CHAETODONTIDAE</b>              |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Chaetodon lunula</i>            |                 |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>C. quadrimaculatus</i>          |                 |   | 1  |   |    |   |   |   |   |    |    |    | 1     |
| <i>C. milliaris</i>                |                 |   | 2  | 1 |    |   |   |   |   |    |    |    | 3     |
| <i>C. oenatissimus</i>             | 2               | 2 | 1  |   |    |   |   |   |   |    |    |    | 5     |
| <i>C. unimaculatus</i>             | 1               |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>C. multictinus</i>              | 2               | 4 | 4  | 2 | 2  | 2 | 2 | 2 | 1 | 2  | 6  |    | 30    |
| <i>Forcipiger flavissimus</i>      | 2               | 1 |    |   |    |   |   |   |   |    |    |    | 3     |
| <b>POMACANTHIDAE</b>               |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Centropyge pottieri</i>         | 3               |   |    |   |    |   |   |   |   |    |    |    | 3     |
| <b>POMACENTRIDAE</b>               |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Abudefduf abdominalis</i>       |                 |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>Stepastes fasciatus</i>         | 2               | 4 | 8  | 2 | 2  | 1 | 1 | 1 |   |    |    |    | 22    |
| <i>Dascyllus albisella</i>         |                 | 2 | 1  | 3 | 1  |   |   |   |   |    |    |    | 7     |
| <i>Chromis agilis</i>              | 8               |   |    |   |    |   |   |   |   |    |    |    | 8     |
| <i>C. hanu</i>                     | 15              |   |    |   |    |   |   |   |   |    |    |    | 15    |
| <i>C. vanderbilti</i>              | 5               |   |    | 5 |    |   |   |   |   |    |    |    | 10    |
| <b>LABRIDAE</b>                    |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Chelinius unifasciatus</i>      | 2               |   | 1  |   |    |   |   |   |   |    |    |    | 3     |
| <i>Pseudochelinus octotaenia</i>   |                 |   | 1  |   |    |   |   |   |   |    |    |    | 1     |
| <i>Coris gairdner</i>              | 1               |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>Thalassoma duperreyi</i>        | 18              | 5 | 12 | 5 | 11 | 9 | 3 | 2 | 2 | 2  | 5  | 6  | 100   |
| <i>Goephus varius</i>              |                 | 1 |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>Stethojulis balteata</i>        |                 |   |    |   |    | 2 | 1 |   |   |    |    |    | 3     |
| <i>Halichoeres ornatus</i>         | 2               |   |    |   |    |   |   |   |   |    |    |    | 2     |
| <b>SCARIDAE</b>                    |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Scarus sororius</i>             |                 |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>S. perspicillatus</i>           | 1               |   |    |   |    |   |   |   |   |    |    |    | 1     |
| <i>S. rubrolineatus</i>            |                 |   | 6  |   | 2  |   |   |   |   |    |    |    | 8     |
| Juvenile Scarus                    |                 |   | 12 | 3 |    |   |   |   |   |    |    |    | 15    |
| <b>ACANTHURIDAE</b>                |                 |   |    |   |    |   |   |   |   |    |    |    |       |
| <i>Zebrasoma flavescens</i>        | 19              | 2 |    |   |    |   | 1 | 3 | 2 | 1  | 6  |    | 44    |

TABLE 5. Cont Inued.

| FISH SPECIES                    | TRANSECT NUMBER |       |       |       |       |       |       |       |       |       |       |       | TOTAL |
|---------------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                 | 1               | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    |       |
| <b>ZANCLIDAE</b>                |                 |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Zanclus canescens</i>        | 2               | 2     |       |       |       |       |       |       |       |       |       |       | 4     |
| <b>MONACANTHIDAE</b>            |                 |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Parupeneus spilosoia</i>     | 12              | 8     | 6     | 26    | 21    | 18    | 15    | 28    | 8     | 15    | 15    | 12    | 188   |
| <i>P. aspidocidus</i>           | 1               |       |       |       |       |       |       |       |       |       |       |       | 1     |
| <b>BALISTIDAE</b>               |                 |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Rhinocanthus rectangulus</i> | 3               | 3     | 1     |       |       |       |       |       |       |       |       |       | 7     |
| <i>Sufflamen bursa</i>          | 1               | 1     |       |       |       |       |       |       |       |       |       |       | 2     |
| <i>Melichthys vidua</i>         |                 |       |       |       |       |       |       |       |       |       |       |       | 1     |
| <i>M. niger</i>                 |                 |       |       |       |       |       |       |       |       |       |       |       | 1     |
| <b>OSTRACIANTIDAE</b>           |                 |       |       |       |       |       |       |       |       |       |       |       |       |
| <i>Ostracion meleagris</i>      | 1               |       |       |       |       |       |       |       |       |       |       |       | 1     |
| <b>SUMMARY</b>                  |                 |       |       |       |       |       |       |       |       |       |       |       |       |
| NUMBER SPECIES                  | 21              | 15    | 21    | 15    | 20    | 19    | 13    | 13    | 3     | 12    | 22    | 14    | 161   |
| NUMBER INDIVIDUALS              | 86              | 97    | 97    | 63    | 84    | 76    | 40    | 47    | 13    | 42    | 78    | 80    | 700   |
| SPECIES DIVERSITY               | 2.472           | 2.205 | 2.647 | 2.002 | 2.373 | 2.458 | 2.099 | 1.617 | 0.925 | 2.027 | 2.697 | 2.442 |       |



PLATE 1. View of shoreline cliff looking upward toward sea surface near transect 2. Pocked appearance of cliff is the result of boring activity of sea urchins. Several colonies of the coral Pocillopora meandrina can be seen growing on the cliff.

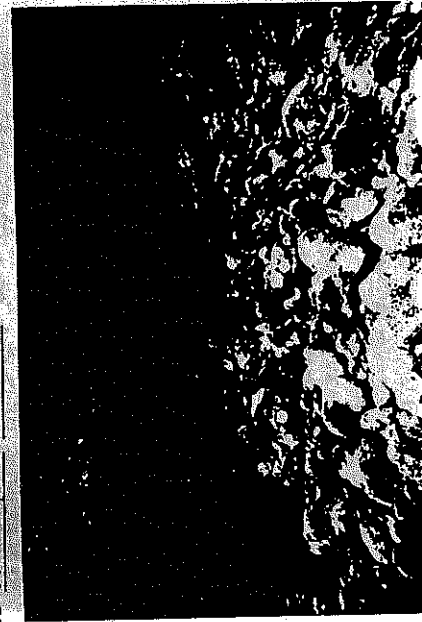


PLATE 2. Boulder channel adjacent to shoreline cliff. Basaltic boulders are rounded as a result of movement by wave forces. Note barren appearance of boulder surfaces. Basaltic platform can be seen at upper left, and shoreline cliff at upper right. Water depth is approximately 15 ft.

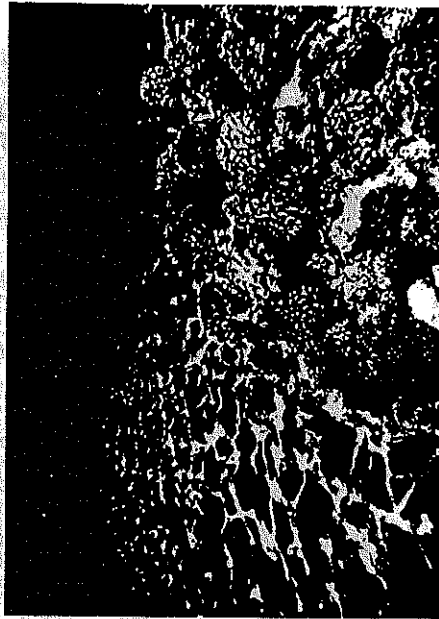


PLATE 3. View of basaltic finger and adjacent sand plain. Dominant coral are branching Pocillopora meandrina. Water depth is approximately 15 ft.



PLATE 4. Basaltic finger on sand plain. Dominant coral is encrusting Porites lobata. Water depth is approximately 15 ft.



PLATE 5. View of portion of flat carbonate reef. Area is devoid of living corals, which were probably killed as a result of sediment scour. Water depth is approximately 30 ft.

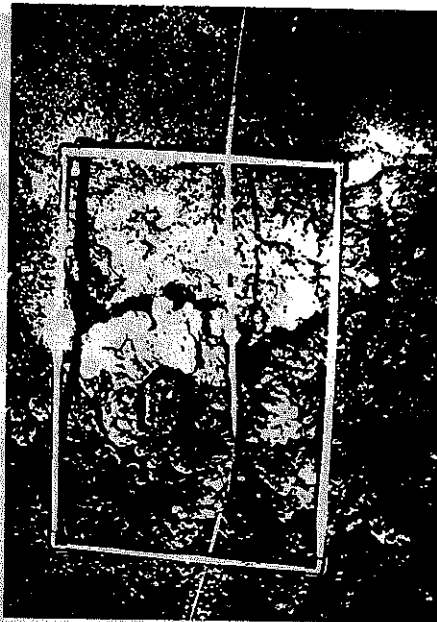


PLATE 6. Transect quadrat photograph at edge of basal finger reef. Living corals occupy the solid surface above the level of the sea floor on the left half of the quadrat. Bared limestone platform on the right half is subjected to sediment scour during episodes of wave stress. Water depth is approximately 25 ft.



PLATE 7. Top view of finger reef at Station f-20. Note elongated shape and sloping sides. Coral coverage is almost exclusively Porites compressa.

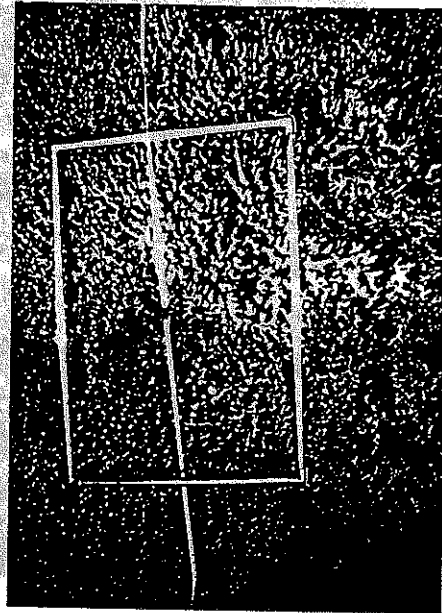


PLATE 8. Transect quadrat photograph in the center of P. compressa thicket. At depths where wave stress is minimal and solid substrata occurs, this species monopolizes bottom cover. Water depth is approximately 65 ft.

APPENDIX C

ENVIRONMENTAL IMPACT OF  
FERTILIZER AND PESTICIDE USE  
ON PROPOSED SOUTH KOHALA  
RESORT DEVELOPMENT

A REPORT TO  
BELT COLLINS & ASSOCIATES  
FOR  
MAUNA KEA PROPERTIES, INC.

MARCH 31, 1987

PREPARED BY

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## I. INTRODUCTION

The proposed development of South Kohala Resort with a hotel, golf course and associated housing units will require application of fertilizers to supply essential plant nutrients to turf and ornamental plants and pesticides to control their associated weed and insect pests. These chemicals may be subject to movement away from the site of application, either by runoff during high-intensity storms, or by movement toward groundwater when water infiltration exceeds evapotranspiration (ET). Although the South Kohala Coast is a low-rainfall, high-ET area which is subject to only infrequent runoff-producing rainfall events and minimal percolation, public concern for the quality of shoreline waters warrants an assessment of the likelihood of contamination of these waters by fertilizers and pesticides applied to the developed areas.

## II. APPROACH

The "Petition for Land Use District Boundary Amendment" (PTLUBA) and "Subconsultant Studies Prepared for the Environmental Assessment" (SSPEA), and "Exhibit A: South Kohala Resort, Mauna Kea Properties, June 19, 1985" (EASKR) were reviewed for background information on geology, hydrology, drainage patterns, flora and fauna of the area, and environmental impacts of development on various factors. (Exhibit A was prepared as support material for Hawaii County permit applications in 1985.)

Testimony and expressed concerns of various individuals and groups pertinent to application of fertilizers and pesticides were reviewed.

The Golf Course Superintendent, Mr. Robert Iamoto and Hotel Grounds Superintendent, Mr. Graham Hains, of the Mauna Kea Resort were interviewed on March 7, 1987 to determine maintenance practices on the existing development. Maintenance practices for the proposed development are expected to be very similar to those of the Mauna Kea Resort and Golf Course.

Finally, a tour was made of the developed areas of the Mauna Kea Resort and the area of the proposed South Kohala Resort development, including: observations of sites of existing brackish water wells used in irrigation of the golf course, sites where brackish groundwater flows into the ocean at Kaunaoa Bay, all major drainage areas in the existing and proposed developments, and the general topography and vegetation of the two areas.

## III. SUMMARY OF QUESTIONS AND CONCERNS RELATED TO THE ENVIRONMENTAL IMPACT OF USE OF CHEMICALS IN THE PROPOSED DEVELOPMENT

The following are some of the most frequently voiced concerns of individuals or groups related to the application of fertilizers and pesticides on the proposed development. These questions will be addressed in subsequent sections of this assessment.

- A. What is the likelihood that significant quantities of chemicals (fertilizers, herbicides, insecticides, other pesticides) applied to the golf course fairways, greens, perimeter areas and to the landscaped areas of hotel grounds and housing areas of the development will reach the coastline at any time during or after the completion of the development?
- B. What is the likelihood that significant quantities of chemicals specified above will reach the groundwater aquifer at any time during or after completion of the development?
- C. What is the likelihood that pesticides used on the project would, by drift during application, or by volatilization after application, be a source of contamination of the environment that would endanger the health of local residents, hotel guests, or others using the public beaches, golf courses, or development facilities?

## IV. ANALYSIS OF RELEVANT FACTORS WHICH MAY IMPACT ON CHEMICAL MOVEMENT AWAY FROM THE AREA OF APPLICATION

### A. Site Factors

#### 1. Geology, soils, topography

Information describing the physical setting is presented in Chapter III, "Probable Impacts", in the PTLUBA document. To summarize, the area to be developed is located on moderately sloping (6-12%), highly dissected land, with lava rock outcrops a common feature of the landscape. The Kawaihae soil in this area varies widely in depth, probably as a result of natural historic erosion; the soil is generally shallow (probably less than one to two feet) and is underlain by relatively impervious, but

likely discontinuous, Pahoehe lava. Our observations of the areas developed for the Mauna Kea Beach golf course and adjacent housing areas suggest that steeper portions of the landscape are left undeveloped while the more gently sloping and level areas are developed. Since the proposed South Kohala Resort is adjacent to the Mauna Kea Resort, and the geology, soils and topography are essentially the same in the two areas, it appears that the new resort would be developed in a similar manner as the existing one. The Land Use Concept Plan, Figure 3 of the EASKR is included here (see Appendix) to show the relative extent of developed and undeveloped areas in both resort areas. Photographs taken in the two areas (see Appendix) show the vegetation and topography of developed and undeveloped areas.

## 2. Climate and Hydrology

Detailed discussion of the hydrology of the area is provided in Chapter III of the PTULBA document. Of particular interest from the standpoint of potential for contamination of coastal waters by fertilizers and pesticides applied to developed resort areas, is the likelihood of runoff and deep percolation which could carry persistent chemicals to beach areas. The South Kohala coastal area is the driest of the state. Mean annual rainfall at the proposed development area is less than 250 mm (10 inches). Monthly averages range from 10 mm (0.4 inches) or less in June, July, and August to about 50 mm (2 inches) in January. The mean rainfall for most months is 25 mm (1 inch) or less.

Evapotranspiration (ET) from frequently irrigated turf in this area is probably close to pan evaporation. On clear, sunny days pan evaporation is approximately 8 mm (0.3 inches) per day or 240 mm (9.4 inches) per month. Thus the monthly potential ET is nearly 10 times the monthly rainfall. There would, therefore, seldom be any deep percolation in this area unless it results from over-irrigation. A review of irrigation practices for the Mauna Kea Golf Course with Mr. Robert Itamoto, Golf Course Superintendent, shows that the practice for that course is to irrigate fairways with 1 inch of water per week (4 inches per month) and tees and greens with 2 inches per week (8 inches per month). This would indicate that the existing golf course is not irrigated excessively. Additionally, the normally dry, undeveloped areas have a relatively high capacity to infiltrate water, since dry soils take in water rapidly. Runoff from these

areas would, therefore, not be a frequent occurrence. This conclusion was supported during our interview with Mr. Itamoto who indicated that water seldom flows in the natural drainage ways, even during the rainy season. The grassed areas of the golf course fairways also apparently intercept runoff from adjacent steep areas, thereby decreasing the quantity of runoff water reaching the coastline.

A review of the drainage patterns for the proposed South Kohala Resort (PTULBA document, Figure 8, page III-9) shows 6 drainage areas designated A, B, C, D, E, and F. Only two of these areas, E and F, reach the coastline at Hapuna Beach. This figure is reproduced in modified form (see Appendix) to illustrate the drainage pattern for the proposed development. The other four drainage areas all drain through the Mauna Kea Resort. Drainage areas A and D reach the coastline in rough, undeveloped areas. Drainage areas B and C reach the coastline at Kaunaoa beach. Table III-1, page III-6 of the PTULBA document gives data on the area and possible runoff volume in cubic feet per second (cfs) from the different drainage areas from a 100 year, 6 hour storm. The data in this table are summarized below.

| Drainage Area | Tributary Area | Developed Peak Flow |
|---------------|----------------|---------------------|
| A             | 580 acres      | 530                 |
| B             | 885 acres      | 705                 |
| C             | 16 acres       | 37                  |
| D             | 35 acres       | 61                  |
| E             | 46 acres       | 79                  |
| F             | 4,680 acres    | 2,570               |

It is also apparent from Figure 8, page III-9 of the PTULBA document, that water flowing to the coastal area from drainage area F comes almost entirely from undeveloped property outside the proposed South Kohala Resort. Thus, the proposed resort accounts for only approximately 1% of the total area drained and approximately 3% of the volume of water during peak flow in drainage ways which reach the coastline at Hapuna Beach. In the event that surface runoff of fertilizers or pesticides from the development did occur, this would likely be sufficiently diluted by runoff from undeveloped areas to be insignificant.

B. Management Factors

Information about management practices, including fertilization, pesticide applications, and irrigation, for the golf course, hotel grounds, and housing areas of the Mauna Kea Resort were obtained from the Golf Course Superintendent and Hotel Grounds Superintendent. It was assumed that maintenance of the proposed South Kohala Resort would be very similar to that of the existing resort.

Chemicals to be used in turfgrass management of the golf course, and maintenance of turf and ornamental plants on hotel grounds and in housing developments are listed in Table 1. The total nitrogen (N) applied in fertilizers is given in the table because it is the only nutrient element in the fertilizers which is both mobile and could possibly have a negative environmental impact.

Table 1a. Fertilizers.

| Location                  | Total Area | Material           | Frequency     | Rate/appli.  | Total N/year |
|---------------------------|------------|--------------------|---------------|--------------|--------------|
| Golf course fairways      | 70 acres   | 16-4-8 or 16-4-4   | Every 6 weeks | 250 lb./acre | 12.1 tons    |
| Golf course greens & tees | 6 acres    | 16-4-8             | Every 4 weeks | 270 lb./acre | 1.7 tons     |
| Hotel grounds and Housing | 60 acres   | 14-14-14 or 16-4-6 | Every 7 weeks | 167 lb./acre | 6.0 tons     |
|                           |            | 6-20-20            |               |              | 0.25 tons    |
|                           |            | Osmocote           |               |              |              |
|                           |            | 14-14-14           |               |              | 0.56 tons    |
| *****                     |            |                    |               |              |              |

Table 1b. Herbicides.

| Location              | Total Area | Material         | Frequency               | Rate/appli.           | Total per year      |
|-----------------------|------------|------------------|-------------------------|-----------------------|---------------------|
| Golf course perimeter | 18 acres   | Paraquat Roundup | Every 4 mo. Every 4 mo. | 1 qt./acre 1 qt./acre | 13.5 gal. 13.5 gal. |

(Table 1b continued)

| Location                  | Total Area | Material                | Frequency                                                                                    | Rate/appli.                         | Total per year         |
|---------------------------|------------|-------------------------|----------------------------------------------------------------------------------------------|-------------------------------------|------------------------|
| Golf course fairways      | 70 acres   | WeedHoe                 | Spot sprays as needed                                                                        | 1.3 qt./acre                        | 50 gal.                |
|                           |            | Sencor                  | Spot sprays as needed                                                                        | 0.5 lb./acre                        | 75 lb.                 |
|                           |            | 33 Plus                 | Spot sprays as needed                                                                        | 1 pint/acre                         | 4 gal.                 |
|                           |            | Surflan                 | Spot sprays as needed                                                                        | 1 pint/acre                         | 5 gal.                 |
| Golf course greens & tees | 6 acres    | None                    | Greens are hand weeded, herbicides for tees are included in the spot sprays as needed above) |                                     |                        |
| Hotel grounds and Housing | 60 acres   | Roundup WeedHoe Surflan | Spot sprays Spot sprays Spot sprays                                                          | 1 qt./acre 1.3 qt./acre 1 pint/acre | 20 gal. 16 gal. 10 ga. |
| *****                     |            |                         |                                                                                              |                                     |                        |

Table 1c. Insecticides.

| Location                  | Total Area | Material                | Frequency                     | Rate/appli. | Total per year              |
|---------------------------|------------|-------------------------|-------------------------------|-------------|-----------------------------|
| Golf course fairways      | 70 acres   | None                    |                               |             |                             |
| Golf course greens & tees | 6 acres    | Sevin                   | 2 to 3 times/year             |             | 100 lb.                     |
| Hotel grounds and Housing | 60 acres   | Isotox Volk Oil Pyronon | As needed As needed As needed |             | 9.0 gal. 15.0 gal. 4.5 gal. |
| *****                     |            |                         |                               |             |                             |

Some of the key properties of environmental significance for these chemicals are given in Table 2 (see Appendix).



## V. ASSESSMENT OF ENVIRONMENTAL IMPACT ON THE QUALITY OF SHORELINE AND GROUNDWATER

The Mauna Kea Resort has been in existence for 23 years. Development, construction and management of all units of the proposed South Kohala Resort will likely be quite similar. The climate, soils and other environmental conditions are very similar to those of the existing development. By studying the impact of agricultural chemicals applied in maintenance of the Mauna Kea Resort on the quality of shoreline and groundwaters, a reasonable assessment of the effect of chemicals applied to the proposed development should be possible. The following assessments are based on the similarity of the two resort developments and on the information presented in section IV.

### A. Quality of Shoreline Waters:

During development of the resort, the major potential hazard to shoreline waters will be sediment from the land-grading operation which may result in soil movement with runoff waters if high-intensity, long-duration storms occur while bare, loose soil is exposed. This hazard can be reduced greatly by planting areas as soon as possible after grading during the rainy season. Inclusion of rapidly germinating temporary turfgrass species, such as annual or perennial ryegrass, in the seeding mixture will further reduce the danger of soil erosion. The only chemical that might be of concern at this time is chlordane or alternative insecticides used for ground termite control which will likely be applied prior to pouring concrete slabs for buildings. Standard construction site precautions to prevent erosion and runoff from disturbed areas should preclude movement of soil and applied insecticides beyond the boundaries of the construction sites.

After development of the resort, little runoff is anticipated except during high-intensity storms of several hours or more duration. Such storms seldom occur (probably less than one per year) and when they do, the concentration of any contaminant in runoff waters is highly diluted so that the impact on shoreline water is not expected to be measurable. Of particular significance with respect to the impact of runoff from the South Kohala Resort development on the quality of water at Hapuna Bay is the fact that most of the proposed development area does not drain into Hapuna Bay, but rather into Kaunaoa Bay near the Westin Mauna Kea (see information in Section IV A2). The mauka portion of the new development will actually contribute runoff and groundwater recharge principally to the makai area occupied by the Mauna Kea

Resort. Most of the runoff reaching Hapuna Beach will originate in undeveloped lands adjacent to the proposed development. Thus it is not likely that either surface runoff or deep percolation to groundwater (and subsequent movement of groundwater to the shoreline) will adversely affect the quality of water at Hapuna Beach.

### B. Quality of Groundwater:

The groundwater now pumped by Mauna Kea Resort from two wells (one makai of Queen Kaahumanu Highway and one mauka) is brackish and is not used for human consumption. The continuous application of nitrogen-containing fertilizers to the golf course could result in leaching of nitrate to the brackish aquifer under conditions of high rainfall or over-irrigation. Considering the local climate (low rainfall, high ET) and the conservative irrigation practices followed (see Section IV A2), we do not expect much contamination of the groundwater by fertilizer nutrients or pesticides. Herbicide and insecticide application rates are generally quite low. Also, chemicals which are likely to be mobile in the soil with infiltrating water (such as 2,4-D and metribuzin) are readily degraded in the soil, thus little residue for penetration to groundwater is expected.

### C. Potential for Drift or Volatilization of Chemicals Applied:

Drift hazards from application of agricultural chemicals are usually associated with aerial applications. All chemical applications on the proposed resort will be from ground spray equipment. Because of low pressures (usually 10 to 40 psi), coarse droplets, and location of sprayer nozzles close to the ground (10 to 18 inches), ground operated agricultural sprayers are relatively free from drift hazards. Most golf courses in Hawaii, as is true for the entire country, are constructed in conjunction with resort and/or housing developments. Agricultural chemicals are commonly applied to all golf courses in Hawaii with no known adverse effects on residents or guests. Chemical applications are usually made during hours when hotel guests and/or golfers are not utilizing the areas. This eliminates most opportunities for exposure of guests or the public to direct contact of sprays.

With the exception of dicamba, which is a minor component of a herbicide used in small quantities on the golf course, the chemicals which will be used in maintenance of the proposed resort are of low volatility. There is very little likelihood that this could present a hazard for guests or the general public.

VI. SUMMARY AND CONCLUSIONS

Because of the relatively small amount of pesticides applied, the low rainfall and high evapotranspiration rate of the area, there is little likelihood of contamination of shoreline or groundwaters from fertilizers or pesticides applied to the proposed development. There is especially little likelihood of contamination of the shoreline of Hapuna Beach due to runoff. Less than 1% of the total area drained and less than 3% of the total volume of water which reaches Hapuna Beach by runoff is from the proposed development. In the unlikely event that either fertilizer N or pesticides are transported to the shoreline in surface waters, it is the shoreline waters near the Westin Mauna Kea that are expected to be affected rather than Hapuna Beach waters. There is also little chance that drift or volatilization of chemicals applied to the resort will pose a hazard to guests or the general public. Ground-operated spray equipment is not associated with high drift hazard. Chemicals will normally be applied during early mornings, when guests or the public would not be present. This is also the time when wind conditions are calmest and drift would be minimal. The chemicals used in grounds maintenance are generally of low volatility and appear to pose no hazard from this standpoint.

VII. RECOMMENDATIONS

There has been a great deal of speculation by concerned individuals and groups about possible adverse effects on shoreline and groundwaters of agricultural chemicals applied to the proposed development. Possible detrimental effects on Hapuna Beach are of special concern. The Mauna Kea Resort and Golf Course have been in existence in a very similar environmental setting for approximately 23 years. Because of the similarity of the environment and the likelihood that development, construction, and maintenance of the proposed resort will be very similar, the Mauna Kea Resort provides an excellent opportunity to obtain quantitative data on the potential for contamination of shoreline or groundwaters by agricultural chemicals applied to the proposed South Kohala Resort. Because of the quantities applied, solubility and potential movement from the site of application, total nitrogen and nitrates would be the most logical chemicals for which to test. Samples of water from the lower irrigation well and from seepage of the brackish lens at the shoreline will provide data on possible contamination of groundwater and associated shoreline waters. Potential sites for sampling brackish water seepage at the shoreline are located at opposite ends of Kaunaoa Bay (see photos 9 and 10 in the Appendix). These seepage areas are highly visible at low tide and can easily be sampled. These samples should be compared with ones obtained from similar areas well removed from the Mauna Kea Resort. A one-time sample will provide data on the effects of the Mauna Kea Resort on quality

of shoreline and groundwaters. The results can then be interpreted with regard to the likely impact of further development in the areas adjacent to Mauna Kea Resort.

## APPENDIX

Table 2. Properties of Pesticides Used in Maintenance of Turfgrasses and Ornamentals in the Proposed South Kohala Resort.

| Pesticide Trade Name | Common Name            | Oral LD 50*<br>mg/kg body wt.                 | Solubility in Water               | Toxicity to Fish & Wildlife             | Soil Behavior                                  |
|----------------------|------------------------|-----------------------------------------------|-----------------------------------|-----------------------------------------|------------------------------------------------|
| <b>Herbicides:</b>   |                        |                                               |                                   |                                         |                                                |
| Weed-See             | MSMA                   | 1,800 (rats)                                  | Very soluble                      | Low                                     | Tightly sorbed                                 |
| Ortho Paraquat CL    | paraquat dichloride    | 150 (rats)<br>35 (cats)                       | Very soluble                      | Mod. to birds<br>Nontoxic to fish       | Inactivated on soil contact                    |
| Roundup              | glyphosate             | 4,320 (rats)                                  | 1% at 25 C                        | Nontoxic                                | Tightly sorbed                                 |
| Sencor               | metribuzin             | 2,200 (rats)                                  | 122 mg/l                          | Moderate                                | Moves readily<br>Low residual                  |
| Surflan              | oryzalin               | 10,000 (rats)                                 | 2.5 mg/l                          | Low to birds<br>High to fish            | Tightly sorbed                                 |
| 33-Plus              | 2,4-D mecoprop dicamba | 370-700 (rats)<br>700-1,500*<br>1,000-2,000** | 46 mg/l<br>0.82 mg/l<br>0.08 mg/l | High to fish<br>Low<br>Nontoxic to fish | Low residual<br>Mod. residual<br>Mod. residual |
| <b>Insecticides:</b> |                        |                                               |                                   |                                         |                                                |
| Isotox               | lindane                | 88-125 (rats)                                 | 10 mg/l                           | Toxic to fish                           | Tightly sorbed                                 |
| Pyronon              | pyrethrins             | 570-1,500*                                    | Insoluble                         | Toxic to fish                           | Not known                                      |
| Sevin                | carbaryl               | 400-850 (rats)                                | < 1%                              | High to fish                            | Mod. Sorb.                                     |
| Volk oil             | petroleum oil          | Relatively non-toxic                          | Insoluble                         | Low                                     | Tightly sorbed                                 |

\* Lethal dose for 50% of test organisms

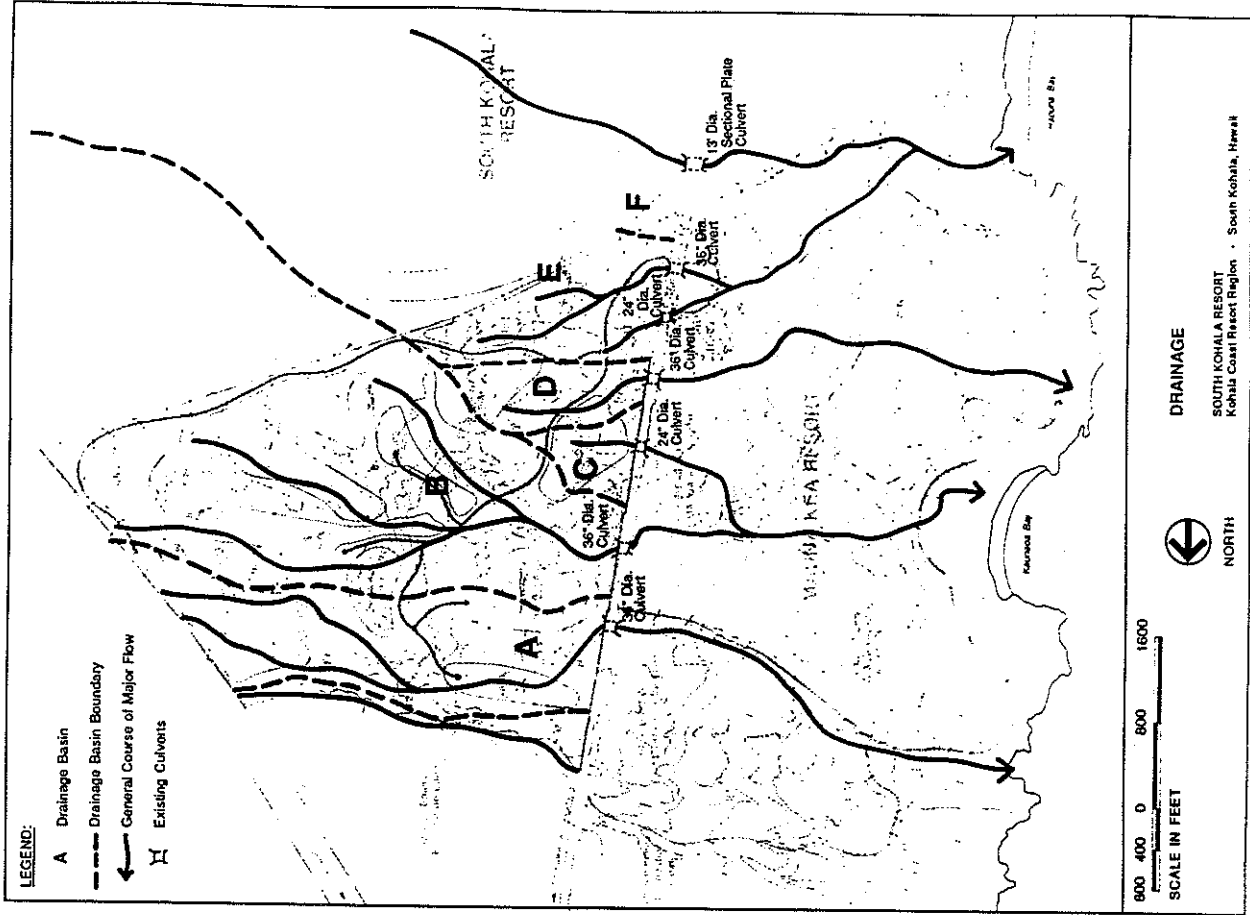
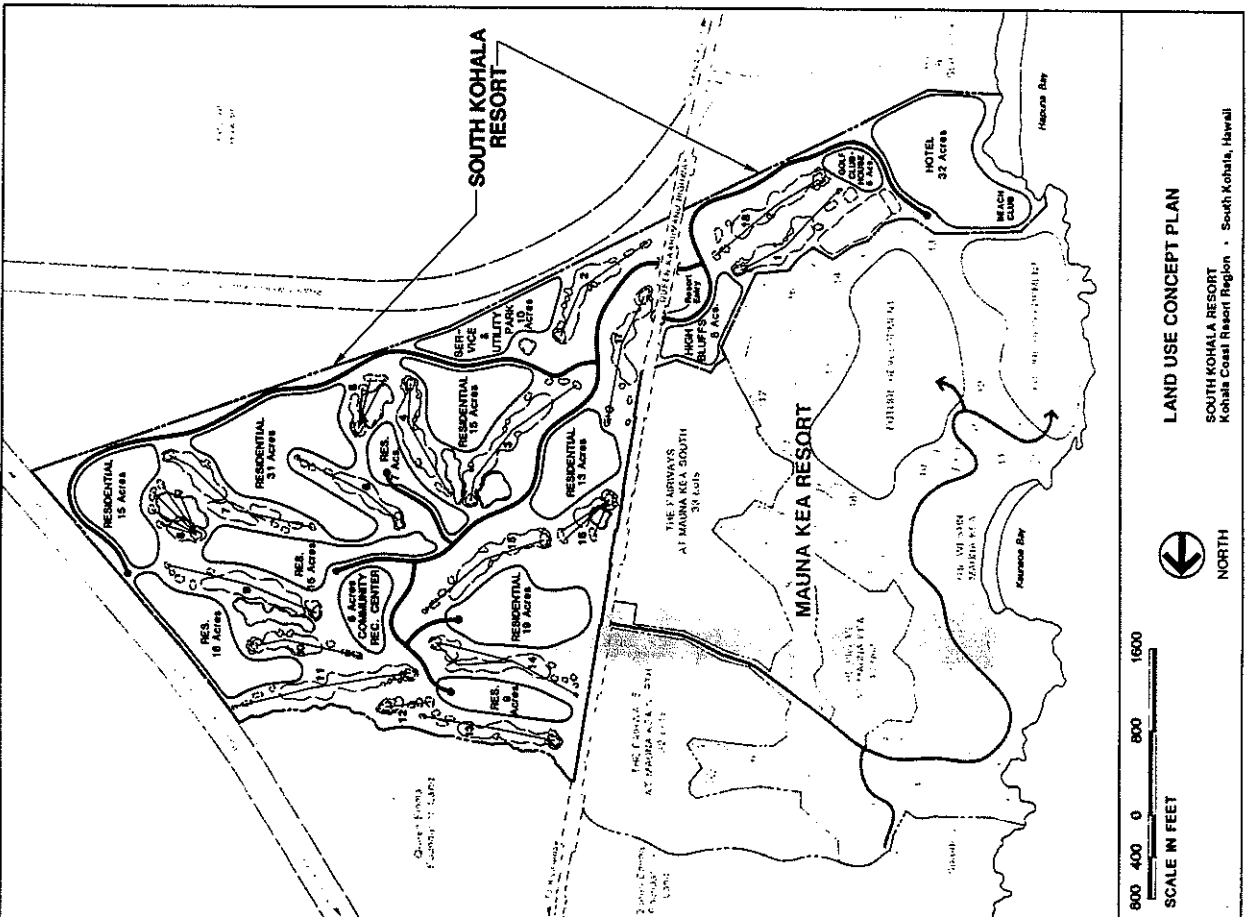




Photo 1. Landscape of makai development area looking toward Hapuna Bay from Mauna Kea Resort.

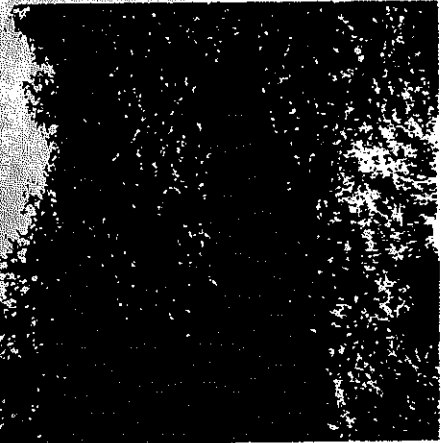


Photo 2. Drainage area E, the major drainage area which carries runoff water from the South Kohala Development site to Hapuna Bay.



Photo 3. Mix of natural and developed land on the south side of Mauna Kea Resort.



Photo 4. Fairway of Mauna Kea Resort golf course developed on gently sloping land within natural land areas.



Photo 5. Mix of housing areas and natural undisturbed and highly dissected landscape on Mauna Kea Resort.



Photo 6. Perimeter area between fairway and undisturbed natural areas, Mauna Kea Resort.



Photo 7. Sediment retention basin on major natural drainage way, Mauna Kea Resort.



Photo 8. Fairway intercepts runoff from natural, undeveloped areas on Mauna Kea Resort.



Photo 9. Potential sampling site for brackish groundwater lens at beach near Westin Mauna Kea.



Photo 10. Potential sampling site for brackish groundwater lens near rock outcrop at south boundary of beach at The Westin Mauna Kea, Kaunaoa Bay.

I. BACKGROUND

In a previous report entitled "Environmental Impact of Fertilizers and Pesticide Use on Proposed South Kohala Resort Development" (C. L. Murdoch and R. E. Green, March 31, 1987), we recommended that shoreline water samples be taken from brackish water seepage sites at opposite ends of Kaunaoa Bay to assess movement of agricultural chemicals to shoreline waters via groundwater. Although the focus of concern is the effect of future development associated with the proposed South Kohala Resort on the quality of shoreline waters at Hapuna Beach, analysis of samples taken at Kaunaoa Bay is considered useful for the reasons given in the previous report: "The Mauna Kea Resort and Golf Course have been in existence in a very similar environmental setting for approximately 23 years. Because of the similarity of the environment and the likelihood that development, construction, and maintenance of the proposed resort will be very similar, the Mauna Kea Resort provides an excellent opportunity to obtain quantitative data on the potential for contamination of shoreline or groundwaters by agricultural chemicals applied to the proposed South Kohala Resort. Because of the quantities applied, solubility, and potential movement from the site, total nitrogen and nitrates would be the most logical chemicals for which to test."

We have assumed that if there is no evidence of enrichment of shoreline water with inorganic nitrogen, then it is highly unlikely that any pesticides applied to the golf course, hotel grounds, or housing areas would have moved to shoreline waters. Fertilizer nitrogen is applied in much higher quantities than herbicides or insecticides (Table 1, Murdoch and Green, 1987).

II. SAMPLING AND CHEMICAL ANALYSIS

Dr. Stephen Dollar was engaged to obtain water samples and conduct the chemical analysis. All samples were collected in the early morning at low tide on a day with minimal wind and wave mixing activity. Samples were taken at a depth of about 10 cm, about 3 m from the shoreline. Samples were obtained at four locations as shown in Figure 1. Station no. 1 was off a small beach just south of Puako, north of Mauna Kea Resort. This Station and Station no. 4, at the north end of Hapuna Beach, represented areas where the ground water seepage was from areas not subject to contamination by agricultural chemicals. The seepage of brackish water at the north and south ends of Kaunaoa Bay (Stations no. 2 and 3) is from Mauna Kea Resort. These samples should show enrichment of nitrogen relative to samples from Station no. 1 if nitrogen from fertilizer

EVALUATION OF THE IMPACT  
OF AGRICULTURAL CHEMICALS ON  
SHORELINE WATERS BY MOVEMENT IN GROUNDWATER  
KAUNAOA BAY, MAUNA KEA RESORT

A Report to Belt Collins and Associates

For

Mauna Kea Properties Inc.

July 13, 1987

Prepared by: Richard E. Green  
Charles L. Murdoch

Sampling and Chemical Analysis by: Stephen Dollar



applied to Mauna Kea Resort developments is moving to groundwater and then to shoreline waters.

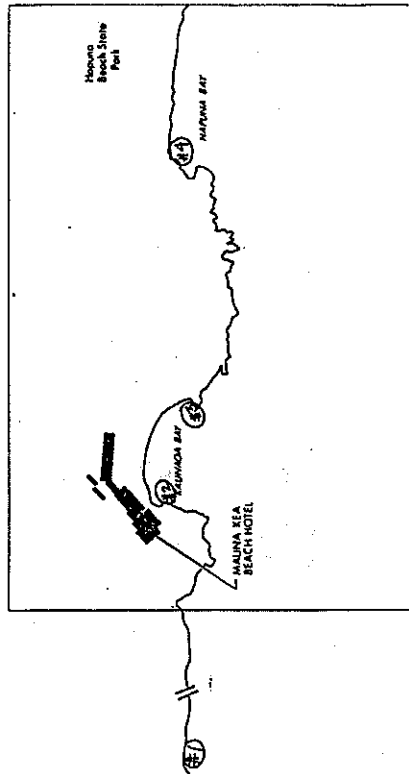


Figure 1. Location of sampling sites, Kaunaoa Bay, Kohala Coast, Hawaii.

### III. RESULTS AND INTERPRETATION

Concentrations of inorganic nitrogen (nitrate plus nitrate and ammonium) and total dissolved nitrogen (TDN) in shoreline samples at the four sampling sites are given in Table 1. In general, TDN is about two times the level of the inorganic nitrogen constituents and is a satisfactory indicator of N level in the water for comparison between sites. The lowest TDN concentration was at Station 3 and the highest at Station 4. Only Station 2 and 4 had higher TDN than Station 1. The very low level at station 3 and relatively low level at Station 2 suggest that there is negligible movement of fertilizer nitrogen from where it is applied on the Mauna Kea Resort to groundwater and subsequently to shoreline waters.

Table 1. Concentrations (mg/l) of inorganic N and total dissolved nitrogen (TDN) in shoreline waters near apparent groundwater seepage areas along the South Kohala Coast, Hawaii.\*

| Station | Location               | Nitrate + |            | TDN   |
|---------|------------------------|-----------|------------|-------|
|         |                        | Nitrite N | Ammonium N |       |
| mg/l    |                        |           |            |       |
| 1       | Beach South of Puako   | 0.075     | 0.002      | 0.151 |
| 2       | North end Kaunaoa Bay  | 0.121     | 0.001      | 0.204 |
| 3       | South end Kaunaoa Bay  | 0.008     | 0.003      | 0.092 |
| 4       | North end Hapuna Beach | 0.160     | 0.002      | 0.255 |

\* Sampling and analysis by Dr. Steven Doller; letter and report of results of chemical analysis are attached. The original data reported in micromoles per liter, were transformed and presented here in milligrams per liter (mg/l) (approximately equal to parts per million) for ease of comparison with values from other areas.

Comparison of the TDN data in Table 1 with those for shoreline waters in other areas in Hawaii provides additional evidence that the shoreline waters of Kaunaoa Bay are not enriched by fertilizer nitrogen. Lau et al. (1973) reported that several water samples from the area near Kahana Bay on Oahu contained a mean TDN of 0.11 mg/l, with a high of 0.30, a low of 0.05 and a standard deviation of 0.057 mg/l. Kahana Bay receives discharge from an undeveloped non-agricultural watershed. The report by Lau et al. suggests that the Kahana Bay coastal area may represent a good standard for class AA waters in Hawaii. The TDN values for Stations 2 and 3 of Kaunaoa Bay were near the Mauna Kea Resort Hotel. TDN from these Stations (0.204 and 0.092 mg/l respectively) are within the range of values measured for the Kahana Bay samples. Additionally, Huifen et al. (1960) found that ground waters receiving recharge from sugarcane fields on Oahu frequently contained more than 10 mg/l nitrate, while most other deep aquifer waters contained 1 to 2 mg/l. Waihole Ditch water on Oahu (derived principally from high elevation groundwater in the Koolau mountains and thus not subject to agricultural contamination)

Koolau mountains, and thus not subject to agricultural contamination) contained 0.4 mg/l nitrate, which exceeds the TDN concentrations of any of the shoreline water samples from Kaunaoa Bay and Hapuna Bay.

#### IV. CONCLUSION

The nitrogen concentration in shoreline water samples from Kaunaoa Bay shows that nitrogen applied to the Mauna Kea Resort for approximately 23 years has not enriched the groundwater and subsequently shoreline waters in areas where brackish water seeps to the ocean. In consideration of the relative amounts applied and the relative solubility, there is even less likelihood of pesticide contamination of shoreline waters from pesticides applied to the development. It is thus unlikely that development of the South Kohala Resort in a manner similar to that of the Mauna Kea Resort would cause contamination of Hapuna Beach by agricultural chemicals used in accordance with recommended practices.

D-3

#### REFERENCES

1. Hufen, T. H., D. Eyre, and W. McConachie. 1980. Underground residence times and chemical quality of basal groundwater in Pearl Harbor and Honolulu aquifers, Oahu, Hawaii. Water Resources Research Center Tech. Rept. No. 129. Univ. Hawaii, Honolulu, HI.
2. Lau, L. S. et al. 1973. The Quality of coastal waters: Second Annual Progress Report. Water Resources Research Center Tech. Rept. No. 77. Univ. Hawaii, Honolulu, HI.
3. Murdoch, C. L., and R. E. Green. 1987. Environmental impact of fertilizer and pesticide use on proposed South Kohala Resort development. Report to Belt Collins and Associates for Mauna Kea Properties Inc., March, 1987.

#### ATTACHMENTS

Letter from Dr. Stephen Dollar and table of results of chemical analysis of shoreline waters.



**STEVEN DOLLAR**

Marine Research Consultant

1720-A Paula Dr.  
Hon. HI 96816  
June 3, 1987

Dr. Richard Green  
Agronomy and Soil Science  
Sherman 223

Dear Dick:

Enclosed are the nutrient concentrations and site map identifying the sampling stations for your assessment of ground water efflux in the vicinity of the Hapuna Beach Resort. In addition to NO<sub>3</sub>+NO<sub>2</sub> and total dissolved nitrogen (TDN), I have also included concentrations of NH<sub>4</sub><sup>+</sup>, PO<sub>4</sub><sup>3-</sup>, and Si. These inorganic nutrients are run as standard procedure for my report, and I thought they might provide you with some additional information.

Concerning station locations, #1 was located off a small beach just south of Puko, #2 and #3 correspond to the north and south edges of the beach at Kaunaoa Bay, i.e. the locations shown in Photos 9 and 10 in your report to BCA. #4 was located at the northern end of Hapuna Beach. All samples were collected in the early morning at low tide on a day with minimal wind and wave mixing activity. All samples were collected approximately 3 m from the shoreline at a depth of about 10 cm.

In viewing the data, the high concentrations of NO<sub>3</sub> and Si at Stations 1, 2, and 4 indicate that these sites all receive substantial effluxes of groundwater. The lack of such extrusion at Station 3 is somewhat curious; however, this is one of the areas located closest to the Golf course. It appears to me that Golf course runoff is insignificant with respect to N concentrations in the areas sampled.

I will be out of town from June 10-29, but if you have any questions, or would like to discuss the data further, please call me at 948-7631.

Sincerely,

Steven Dollar, Ph.D.

Nutrient concentrations of replicate samples of near-shore ocean waters in the vicinity of Hapuna Beach Resort. All concentrations are micromolar.

| STATION | NO3 + NO2      | NH4          | TDN            | PO4          | SI               |
|---------|----------------|--------------|----------------|--------------|------------------|
| 1       | 5.33<br>5.39   | 0.17<br>0.12 | 11.31<br>10.31 | 0.21<br>0.21 | 71.64<br>72.57   |
| 2       | 8.56<br>8.72   | 0.10<br>0.10 | 14.50<br>14.69 | 0.24<br>0.24 | 77.20<br>77.20   |
| 3       | 0.59<br>0.52   | 0.19<br>0.19 | 6.62<br>6.47   | 0.11<br>0.11 | 6.75<br>6.75     |
| 4       | 11.17<br>11.65 | 0.17<br>0.20 | 19.09<br>17.36 | 0.39<br>0.41 | 138.38<br>139.31 |

BOTANICAL SURVEY OF THE  
PROPOSED DEVELOPMENT SITES OF  
MAUNA KEA PROPERTIES, INC. ON THE  
ISLAND OF HAWAII

INTRODUCTION

The following report summarizes methods and findings of a botanical survey conducted by Earthwatch, Environmental Resource Investigators, environmental consultants to the firm of Belt, Collins and Associates. The primary objectives of this study were to survey and describe the existing vegetation types, to inventory the flora, and to look for any listed, proposed or candidate endangered plant species, in order to assess the impact of development on the existing flora.

Four potential development areas were surveyed and are described in this report, following Belt, Collins & Associates' "Property Under Development" plan, revised March 1983, as: Area I (The Uplands at Mauna Kea), Area II (The High Bluffs at Mauna Kea); Area III (The Stone Bluffs at Mauna Kea) and Area IV (The Bluffs at Mauna Kea; Hapuna Beach and Tennis Club). These areas are located along the leeward coast of South Kohala near the existing Mauna Kea Beach Hotel complex and associated residential areas.

The surveys were conducted on February 11, 18, 19 and 20, 1984.

Prepared by:

Erin Marie Hall  
Earthwatch, Environmental Resource Investigators  
Honolulu, Hawaii

March 1984

For:

Belt, Collins & Associates  
Honolulu, Hawaii

#### ENVIRONMENTAL SETTING

Except for a few scattered erosional gulches, the original gently sloping form of a prehistoric Mauna Kea flow remains essentially unchanged. Soils range in depth from less than one inch, in places of exposed pahoehoe bedrock, to several feet in scattered pockets and depressions. Soils are reddish brown, loosely consolidated aridisols characteristic of hot, dry desert climates. Along the coast low, rugged lava sea cliffs occur with occasional sandy beaches and bays. Elevation ranges from sea level in Area IV to approximately 600 feet near the mauka boundary (easternmost side) of Area I.

Leeward South Kohala generally receives less than 10 inches of rainfall per year, most occurring during the winter months. For much of the year long periods of drought are not unusual and the vegetation generally consists of species which can survive low precipitation and occasional brush fires. Due to infrequent rainfall and the porous nature of much of the study area, surface water features are limited within the study area; however, a flowing stream was observed in Waiulaula Gulch which joins Area I's northern boundary gulch outside the property line. The boundary gulch itself was dry, but large rounded boulders observed within the gulch attest to occasional flooding or heavy flows from past rainfalls.

The four areas surveyed fall within the potential vegetation zone of "kiawe and lowland shrubs" according to Ripperton and Hosaka (in Armstrong, 1973). Potential vegetation is the vegetation which would be

expected for an area given the existing climate, elevation and available plant species. The kiawe and lowland shrub zone is typical of areas below 1000 feet elevation receiving less than 20 inches of rainfall per year, and is characterized by kiawe, koa-haole, finger grass and pili grass. Kiawe thickets occupy coastal lowlands while uplands are characterized by more extensive grasslands and sparse scrub growth. Specific vegetation as determined by field survey for this study will be described in the "Results" section.

#### SURVEY METHODS

##### Preparatory Research

Prior to field survey a review was made of botanical literature including lists or summaries of rare, threatened or endangered native plant species which might possibly occur in the study area. Personal interviews were conducted with government agency representatives familiar with native vegetation within this area of the island of Hawaii. Existing maps and aerial photographs, including some as recent as 1983 and 1984, were examined to determine access, terrain characteristics and problems which might be encountered during field survey. Physiographic characteristics and general vegetation cover types were identified on the aerial photos.

##### Field Survey

A reconnaissance survey was made of the study area initially to familiarize the survey team with the vegetative cover types, locations which would require more intensive survey time, and difficulty of access

within the study area.

More intensive walk-through field surveys were then conducted throughout each of the four areas. Those areas likely to support important native plant species were surveyed more intensively than areas obviously covered with dense growths of weedy exotic vegetation. Hence, there was a concentration on the coastal strand of Area IV and the uplands of Area I--both areas in which rare native plant species might be more likely to occur.

Vegetation patterns and associations, floristic composition, vegetative structure, and relative cover and abundance were evaluated subjectively in the field. Plant species observed within the project area were recorded; those which could not be verified positively in the field were collected for subsequent identification.

#### Analysis

Upon completion of the field survey, voucher specimens collected in the field were identified at the University of Hawaii Botany Dept. and herbarium collection. All data were synthesized into the checklists, tables and written summaries presented in this report.

## RESULTS OF THE VEGETATION SURVEY

### Vegetation Cover Types

Results of the botanical field survey indicate that four major vegetation cover types occur within the study area, although variations and gradations are common among these. Cover types are based on a) vegetative structure (height, physiognomy, stratification, cover/abundance), b) floristic composition (dominant plant species), and c) habitat association (site and terrain characteristics).

The four cover types are described as: Open Scrub Grassland (OSG), Kiawe Woodland (KW), Coastal Strand (C), and Disturbed/Landscaped areas (D). Table 1 provides a brief summary of each cover type, and they are described more fully below. Table 2 provides a brief summary description of each Area by cover type and important plant species, and the Appendix provides a list of plant species observed and the cover type in which they are located.

Open Scrub Grassland, the predominant cover type of the study area, is characterized by extensive grassland areas on gently rolling hills, with scattered forbs, shrubs and trees generally providing less than 25% cover. Boulders, exposed soil and rock outcrops are common in this cover type. Buffelgrass (Cenchrus ciliaris) and feathery pennisetum (Pennisetum setosum) are drought-resistant, exotic perennial grasses typical of these grasslands as well as of dry leeward grasslands throughout the islands. In highly disturbed places such as Areas III and IV, these grasses tend to crowd out other species so that species diversity is usually low and may include only fountain grass (Pennisetum setaceum),

TABLE 1  
SUMMARY OF COVER TYPES

| <u>Cover Type</u>       | <u>Characteristics</u>                                                                                                                                                                              | <u>Important Plant Species</u>                                                                                                                                  |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Open Scrub Grassland | Grasses and forbs form the predominant cover with scattered shrubs and trees generally less than 25% cover. Plants are adapted to dry conditions. Predominant cover type of Areas I, II, and III.   | Herb layer: Buffelgrass, Pili grass, Feathery pennisetum<br>'Emo-loa, Pa'ū-o-hi'i-'aka<br>Shrub layer: 'Ilima, Hi'aloa<br>Koa-haole, Kiawe<br>Tree layer: Kiawe |
| 2. Kiawe Woodland       | Trees and shrubs (15-25 ft. tall) form a dense canopy (greater than 60% cover) near the coast and in gulches or depressions. Occurs to some extent in all Areas--predominant cover type of Area IV. | Herb layer: Feathery pennisetum<br>Nettle-leaved goosefoot,<br>Koali-'awania<br>Shrub layer: Sisal, Kiawe<br>Tree layer: Kiawe                                  |
| 3. Coastal Strand       | Strand vegetation associated with beaches and rocky cliffs. Trees, shrubs and vines in sand substrate; low-lying forbs and grasses in lava rock substrate. Occurs in Area IV.                       | Herb layer: Pohuehue, Beach dropseed, Nena, Nohu<br>Shrub layer: Naupaka-kahakai,<br>Tree/shrub layer: Kiawe, Hau,<br>Tree heliotrope                           |
| 4. Disturbed/Landscaped | Exotic weeds and ornamentals typical of disturbed areas such as roadsides, golf-course fringes, trails. Occurs in all four Areas.                                                                   | Herb layer: Fountain grass,<br>Bristly foxtail, Garden spurge, Asiatic pennywort<br>Shrub layer: Castor bean,<br>Bougainvillea<br>Tree layer: Coconut palm      |

TABLE 2  
SUMMARY DESCRIPTIONS OF AREAS I-IV

| <u>Area</u> | <u>Description</u>                                                                                                                                                                                                                                                                                                                                                                                                                                | <u>Native Plant Species</u>                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 1. Area I   | This is the least disturbed of the areas although dirt roads & trails criss-cross the site. The uplands host several endemic, though no rare, plant species. OSG (Open Scrub Grassland) covers most of Area I, with KW (Kiawe Woodland) in the northern boundary gulch as well as in smaller gulches and depressions.                                                                                                                             | 'Emo-loa<br>'ihi (blue-seeded portulaca)<br>pa'ū-o-hi'i-'aka<br>kaoli-'awania<br>pili grass<br>'ilima           |
| 2. Area II  | This area is bounded by the golf course, Hapuna Beach Park and the main highway; a dirt road and jogging path cross through the site. OSG covers the rolling hills with KW found in the gulches and on golf course fringes. Pili grass is found on some hillsides, but in general the area is characterized by exotic grasses and shrubs.                                                                                                         | pili grass<br>'ilima<br>hi'aloa<br>pa'ū-o-hi'i-'aka                                                             |
| 3. Area III | This is the most highly disturbed of the areas, bounded by golf course and hotel facilities, with a dirt road crossing through and a large clearing with soil mounds & machinery; part of this area also includes landscaped areas associated with the hotel. This area hosts the largest number of plant species ("weeds") associated with disturbed areas. OSG covers most of the area with KW on golf course fringes & in depressions.         | hi'aloa<br>'ilima                                                                                               |
| 4. Area IV  | This area is bounded by golf course, Hapuna Beach Park & ocean. Although the area in general is highly disturbed, with paved & unpaved roads & paths throughout, the coastline does host native coastal species, including the rare indigenous plant nena, and a buffer zone is recommended for this sensitive coastal habitat. KW covers much of this area, near the coast & in gulches. OSG is found on hillsides and in some coastal sections. | nena<br>nohu<br>hau<br>hala<br>pohuehue<br>'aki'aki<br>naupaka-kahakai<br>pa'ū-o-hi'i-'aka<br>'ilima<br>hi'aloa |

'ilima (*Sida* spp.), hi'aloa (*Malthesia indica* var. *americana*), lauki (*Cassia leschenaultiana*) and kiawe (*Prosopis pallida*). Open scrub grasslands in lesser-disturbed sections of Areas I and II host more diverse species, including some endemic grasses and forbs. Pili grass (*Heteropogon contortus*) is an indigenous grass which was commonly used in Hawaii as thatch material, and is found on ridgetops of Areas I and II. 'Ema-loa or kawelu (*Eragrostis variabilis*) is an endemic grass found in the uplands of Area I. The blue-seeded portulaca or 'ihi (*Portulaca cyanosperma*) and pa'u-o-hi-i-'aka (*Jacquemontia sandwicensis*) are endemic species also commonly found in the uplands of Area I. Other species observed include stinkgrass (*Eragrostis cilianensis*), sixweeks threawn (*Aristida adensionis*) and koa-haole (*Leucaena leucocephala*). Grasses and forbs in this cover type are generally 1-2 ft. high in open, exposed areas; kiawe shrubs average 6-10 ft. in height.

Figure 1 shows a typical view of Open Scrub Grassland in Area I.

Kiawe Woodland forms the most extensive cover where groundwater is more available--in the lower elevations of Area IV, near the coast, as well as in gulches and depressions of Areas I, II, III and IV. Kiawe is an exotic plant species introduced to Hawaii in the 1800's. It is well adapted to the harsh, arid environment of this and most other leeward areas, and constitutes the major species of the tree and shrub layer in all cover types (except landscaped areas) of the proposed development. Whereas Open Scrub Grassland is characterized by sparse tree and shrub cover, Kiawe Woodland is characterized by a dense tree canopy (greater than 60% cover) and strongly shaded understory. Soils

are deeper and more moist than in OSG, with occasional dense layers of organic debris (kiawe branches, leaves, seed pods). Understory species include feathery pennisetum (taller here than in exposed hillsides of OSG), guinea grass (*Panicum maximum*) and nettle-leaved goosefoot (*Chenopodium murale*). Sisal (*Agave sisalana*) and koali-'awania (*Ipomoea congesta*) are found in the larger gulches, but in general kiawe and feathery pennisetum characterize the gulches as well as coastal woodland areas. The vegetation overall is greener, taller and more vigorous in the gulch areas compared to surrounding grasslands where water and shade are less available. Trees average 15-25 ft. in height, though some may reach heights of 40 feet. Figure 2 shows Kiawe Woodland in the northern gulch bounding Area I.

Coastal Strand, found in Area IV, consists of low, rugged volcanic cliffs with some isolated pockets of rocky shoreline and beach sand which host most of the vegetation of this cover type. Coastal trees and shrubs such as hau (*Hibiscus tiliaceus*), naupaka-kahakai (*Scaevola taccada*), and tree heliotrope (*Messerschmidia argentea*) are found in sand substrate, as well as the beach morning glory or pohuehue (*Ipomoea brasiliensis*) and the beach dropseed or 'aki'aki (*Sporobolus virginicus*). All of these are indigenous species except for the exotic tree heliotrope. Along the cliffs and rocky shoreline other native coastal species include nobu (*Tribulus cistoides*), pa'u-o-hi-i-'aka, 'ilima and nena (*Heliotropium curassavicum*). Exotic grasses and forbs such as swollen fingergrass (*Chloris inflata*) and Australian salt bush (*Atriplex semibaccata*) are also present. Often the transition between Coastal Strand and Kiawe Woodland or Open Scrub Grassland is a subtle one, with one cover type grading into



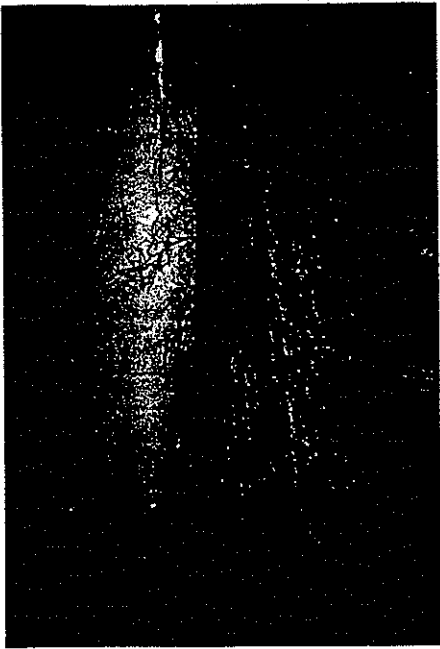


Figure 1  
Open Scrub Grassland: Area I



Figure 2  
Kiawe Woodland in Northern Gulch

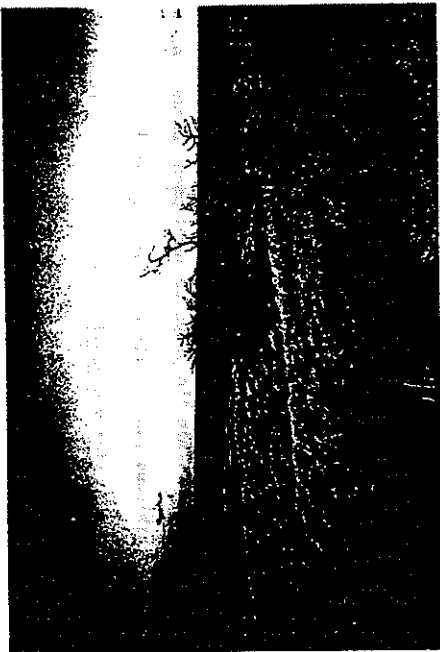


Figure 1  
Open Scrub Grassland: Area I



Figure 2  
Kiawe Woodland in Northern Gulch

another at the shoreline. Although the "Nature Trail" that extends along the entire coastline between Hapuna Beach and the Mauna Kea Beach Hotel gets some heavy pedestrian use, the native coastal plants on the shore side of the trail are in some areas still numerous and/or vigorous.

Disturbed/landscaped areas are characterized by exotic weeds and ornamentals typical of disturbed roadside areas, parking lots, fringes of golfcourses, construction sites, etc. Ornamental species are found primarily in the makai portion of Area III near the landscaped offices and hotel guest facilities. Most of these ornamental species are not

included in the checklist of plant species since they are not naturally occurring plant species. However, many of the exotic weeds in this cover type are typical of disturbed areas and may be indicative of plant species which would appear in areas of the project site under construction situations: Bermuda grass (Cynodon dactylon), spurges (Euphorbia spp.), bristly foxtail (Setaria verticillata), keeled goosefoot (Chenopodium carinatum), castor bean (Ricinus communis), and others (see Appendix).

#### Endangered or Rare Plant Species

No proposed, listed or candidate endangered or threatened plant species were observed within the proposed development areas. Although a member of the hibiscus family, listed as endangered by St. John and Corn, 1981--ko'oloa'ula (Abutilon menziesii)--could possibly be found in the general area according to state botanist C. Corn, the survey team, though familiar with the species, did not observe it in or near the areas surveyed. (This species was among the 892 native Hawaiian plant species proposed for listing in 1976, and later withdrawn due to expiration of the deadline for making the proposed rules final. It was not listed in the 1980 U.S. Fish and Wildlife Service review.)

#### Other Important Native Plant Species

The vegetation in general is typical of dry leeward areas where kiawe and exotic weeds and grasses have replaced most native species. No remnant patches of native dry forest (e.g. wiliwili or 'ohe) were observed, although remnants of native grasslands--pili grass and 'emo-loa--were observed in Areas I and II. Of the native species observed, some are still commonly found throughout the islands ('iima, hi'aloa, kosi-'awania, 'aki'aki) while others, though not rare, are found less commonly today and care should be taken to preserve them whenever possible as part of the natural environment, especially along the shoreline (nena, nohu, pa'u-o'hi'i-'aka).

#### SIGNIFICANCE OF FINDINGS

The proposed development of lands by Mauna Kea Properties, Inc. will involve clearing, grading and construction of roads, parking areas, golf courses, residential areas and associated public utility systems.

Area I (Uplands at Mauna Kea) will require clearing of vegetation to facilitate development of a golf course, clubhouse and five sub-areas of low to medium density residential housing. Although extensive earthwork will be required, it is anticipated that portions of the 405-acre parcel will be left intact wherever feasible, allowing incorporation of natural landscape elements, including present endemic species, into proposed developments.

Area II (High Bluffs at Mauna Kea) will require clearing of vegetation to accommodate the starter station and fairways 9 and 10 of the proposed golf course. As with Area I, trees and shrubs will be left

intact wherever natural elements are to remain as part of the landscape, however most of the area will be subjected to site preparation and modification.

Area III (Stone Bluffs at Mauna Kea) will require clearing of vegetation to accommodate residential condominiums. Area III occupies land surrounded by existing golf course, and most of this area will be subjected to clearing and site preparation.

Area IV (Bluffs at Mauna Kea and Hapuna Beach and Tennis Club) will require clearing of vegetation to accommodate 200 units of residential condominiums, a 300 unit hotel and associated beach clubs. As with other areas, selected portions of this 77 acre parcel may be left as natural landscape elements, particularly those areas along the shoreline within a proposed 40 foot setback of the vegetation line.

For all phases of development, temporary increases in noise, dust and air pollution may be anticipated during clearing of trees, shrubs and grasses. Some of the larger, more aesthetic kiawe trees may be left undisturbed, however most of the trees and shrubs will likely be removed. Vegetative debris will be disposed of in accordance with state or county requirements at a suitable upland site. This will minimize the potential for fire hazards associated with arid, windswept environments. Some productive use could perhaps be made of the vegetative material (i.e. kiawe charcoal or wood chips).

Soil erosion on sloping lands may occur during heavy infrequent rains if exposed soils are not quickly stabilized or revegetated. Measures should be taken to minimize fugitive dust and prevent sediment runoff into major gulches. Revegetation of exposed soils should be accomplished soon after clearing to prevent fugitive dust problems in nearby developed

areas. Following planting of new grasses, shrubs and trees, demands for water will be high, since proper establishment and long-term maintenance of plants will require frequent watering. Selection of drought-tolerant plants will help to minimize demands, but overall increases in water consumption may be anticipated as a result of landscaping. Landscaping will also result in greater plant species diversity and marked scenic contrast with the remaining drier natural vegetation. Depending on the selection of plant species, landscaping could result in an increase in native plant species occurrence (e.g. by planting wiliwili, sandalwood). However, if non-native ornamental trees and shrubs are selected there will be an overall decrease in the number of native species found in the area.

Most of the plant species observed are exotic xerophytes adapted to harsh, dry environments, with a low species diversity within all but the Disturbed/Landscaped cover type which has a high diversity of exotic weedy species. Areas II and III, which are surrounded by golf course, host the least number of native species and those that are found in these areas are primarily indigenous species such as hi'aloa and 'ilima, which are common to disturbed lowland areas throughout the islands. These two areas are therefore least likely to have adverse effects from the removal of vegetation. Area I has several native species which would be affected by clearing and grading--the endemic grass 'emo-loa, and the endemic forbs blue-seeded 'ihi and pa'u-o'h'i-'aka. As none of these species are rare, and as all were observed in Open Scrub Grassland on lands outside the eastern and southern boundaries of Area I, the impact would not be an irreplaceable commitment of resources. Theoretically

some of the species involved could be replanted, replaced or incorporated into the landscape, as mentioned previously, rather than being removed completely from the environment.

Native plants in Area IV are concentrated along the shoreline and are not likely to be disturbed during construction provided a buffer is established as proposed (at least 40 feet inland from the vegetation line along the shore). Secondary impacts associated with increased use of shoreline areas and possible trampling of native plant assemblages may be anticipated after construction. Native plants potentially affected include the nena (Heliotropium curassavicum) which is an indigenous species listed as very rare and in danger of being depleted (Fosberg, 1975), so special efforts should be taken to preserve the proposed buffer zone on the shoreline so that an irreversible loss of this sensitive and decreasing native habitat does not occur in Area IV.

#### CONCLUSION

In conclusion, although there will be an initial loss of vegetation, no significant adverse environmental impacts relative to flora are anticipated as a result of the proposed development because 1) species observed are primarily exotic species common throughout Hawaii; 2) no listed or proposed endangered or threatened plant species were observed in or near the proposed development areas; 3) both aerial photographs and field observations indicate surrounding lands which are characterized by the same vegetation cover types (and native species according to field

investigations) found within the proposed sites, and 4) all 4 areas surveyed are essentially undeveloped lands which are, except for Area I, currently surrounded by developed areas and are themselves highly disturbed areas subject to frequent pedestrian use.

APPENDIX  
PLANT SPECIES CHECKLIST

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Families are arranged alphabetically. Genera and species are listed alphabetically within each family. Taxonomy and nomenclature generally follows St. John (1973) except where more commonly accepted names are listed.

For each species the following information is provided:

1. Scientific name with author citation.
2. Common English name and/or Hawaiian name, when known.
3. Status of the species:

Endemic = endemic to the Hawaiian Islands; occurring naturally nowhere else in the world.

Indigenous = native to the Hawaiian Islands but also occurring naturally elsewhere.

Polynesian Introduction = plants brought by the Polynesian immigrants prior to contact with the western World.

Exotic = plants of accidental or deliberate introduction after contact.

| Scientific Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Common Name(s)                                                                                                                                                                                                                                                                                                                                                         | Status                                                                                                                                                                | Location                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| CRUCIFERAE (Mustard Family)<br><i>Brassica campestris</i> L.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Wild mustard                                                                                                                                                                                                                                                                                                                                                           | Exotic                                                                                                                                                                | D                                                                                                                                |
| CUCURBITACEAE (Gourd Family)<br><i>Cucumis dipsaceus</i> Ehrenb. ex Spach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Wild spiny cucumber                                                                                                                                                                                                                                                                                                                                                    | Exotic                                                                                                                                                                | D                                                                                                                                |
| CYPERACEAE (Sedge Family)<br><i>Cyperus rotundus</i> L.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Nut grass; kili'o'opu                                                                                                                                                                                                                                                                                                                                                  | Exotic                                                                                                                                                                | D                                                                                                                                |
| EUPHORBIACEAE (Spurge Family)<br><i>Euphorbia hirta</i> L.<br><i>Euphorbia prostrata</i> Ait.<br><i>Ricinus communis</i> L.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Garden spurge; koko-kahiki<br>Prostrate spurge<br>Castor bean; koll                                                                                                                                                                                                                                                                                                    | Exotic<br>Exotic<br>Exotic                                                                                                                                            | D, OSG<br>D<br>D                                                                                                                 |
| GOODENIACEAE (Naupaka Family)<br>* <i>Scaevola taccada</i> (Gaertn.) Roxb.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Beach naupaka; naupaka-kahakai                                                                                                                                                                                                                                                                                                                                         | Indigenous                                                                                                                                                            | C                                                                                                                                |
| GRAMINEAE (Grass Family)<br><i>Aristida adensionis</i> L.<br><i>Cenchrus ciliaris</i> L.<br><i>Cenchrus echinatus</i> L.<br><i>Chloris divaricata</i> R.Br.<br><i>Chloris inflata</i> Link<br><i>Cynodon dactylon</i> (L.) Pers.<br><i>Dactyloctenium aegyptium</i> (L.) Willd.<br><i>Eleusine indica</i> (L.) Gaertn.<br><i>Eragrostis cilianensis</i> (All.)<br>Vignolo-Lutati<br>* <i>Eragrostis variabilis</i> (Gaud.) Hbd.<br>* <i>Heteropogon contortus</i> (L.) Beauv.<br>ex R. & S.<br><i>Panicum maximum</i> Jacq.<br><i>Pennisetum setaceum</i> (Forsk.) Chiov.<br><i>Pennisetum setosum</i> (Sw.) L.C. Rich.<br>in Pers.<br><i>Rhynchelytrum repens</i> (Willd.)<br>C.E. Hubb.<br><i>Setaria verticillata</i> (L.) Beauv.<br>* <i>Sporobolus virginicus</i> (L.) Kunth | Sixweeks threawn<br>Buffelgrass<br>Sandbur; 'ume'alu<br>Stargrass<br>Swollen fingergrass; mau'ulei<br>Bermuda grass; manienie<br>Beach wiregrass<br>Wiregrass; manienie-ali'i<br>Stinkgrass<br>'Emo-loa; variable lovegrass<br>Pili; pili grass<br>Guinea grass<br>Fountaingrass<br>Feathery pennisetum<br>Natal redtop<br>Bristly foxtail<br>Beach dropseed; 'aki'aki | Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic<br>Endemic<br>Indigenous<br>Exotic<br>Exotic<br>Exotic<br>Indigenous | OSG<br>OSG, C, D<br>D<br>D<br>OSG, C, D<br>OSG, C, D<br>C<br>D<br>OSG<br>OSG<br>OSG<br>OSG, D<br>OSG, KW, C, D<br>D<br>C, D<br>C |

| Scientific Name                                                                                                                                                                                                                                                          | Common Name(s)                                                                                                      | Status                                         | Location                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------|
| AMARANTHACEAE (Amaranth Family)<br><i>Amaranthus viridis</i> L.                                                                                                                                                                                                          | Slender amaranth; pakai                                                                                             | Exotic                                         | D                        |
| AMARYLLIDACEAE (Amaryllis Family)<br><i>Agave sisalana</i> Perrine ex Engelm.                                                                                                                                                                                            | Sisal; malina                                                                                                       | Exotic                                         | KW                       |
| APOCYNACEAE (Periwinkle Family)<br><i>Thevetia peruviana</i> (Pers.) K.Schum.                                                                                                                                                                                            | Be-still tree; noho-malie                                                                                           | Exotic                                         | D                        |
| ASCLEPIADACEAE (Milkweed Family)<br><i>Calotropis gigantea</i> (L.) R.Br. ex Ait.f.                                                                                                                                                                                      | Crown flower; pua-kalaunu                                                                                           | Exotic                                         | D                        |
| BORAGINACEAE (Heliotrope Family)<br><i>Cordia subcordata</i> Lam.<br>* <i>Heliotropium curassavicum</i> L.<br><i>Messerschmidia argentea</i> (L.f.) Johnston                                                                                                             | Kou<br>Seaside heliotrope; nena<br>Tree heliotrope                                                                  | Polynesian Intro.<br>Indigenous<br>Exotic      | D<br>C<br>C              |
| CARYOPHYLLACEAE (Pink Family)<br><i>Spargula arvensis</i> L.                                                                                                                                                                                                             | Corn spurry                                                                                                         | Exotic                                         | D                        |
| CHENOPODIACEAE (Goosefoot Family)<br><i>Atriplex semibaccata</i> R.Br.<br><i>Chenopodium carinatum</i> R.Br.<br><i>Chenopodium murale</i> L.                                                                                                                             | Australian salt bush<br>Keel'd goosefoot<br>Nettle-leaved goosefoot                                                 | Exotic<br>Exotic<br>Exotic                     | C, D<br>D<br>OSG, KW, C  |
| COMPOSITAE (Sunflower Family)<br><i>Bidens pilosa</i> var. <i>pilosa</i> L.<br><i>Emilia javanica</i> (Burm.f.) C.B. Robins.<br><i>Erechtites hieracifolia</i> (L.) Raf.<br><i>Sonchus oleraceus</i> L.<br><i>Wedelia trilobata</i> (L.) Hitchc.                         | Beggar's tick; ko'oko'olau<br>Red pua-lele<br>Fireweed<br>Sow thistle; pua-lele<br>Wedelia                          | Exotic<br>Exotic<br>Exotic<br>Exotic<br>Exotic | D<br>D<br>C, D<br>D<br>D |
| COMBRETACEAE (Terminalia Family)<br><i>Terminalia catappa</i> L.                                                                                                                                                                                                         | False kamani; kamani-haole                                                                                          | Exotic                                         | C, D                     |
| CONVOLVULACEAE (Morning Glory Family)<br>* <i>Ipomoea brasiliensis</i> (L.) Sweet<br>* <i>Ipomoea congesta</i> R.Br.<br>* <i>Jacquemontia sandwicensis</i><br>var. <i>sandwicensis</i> Gray<br>* <i>Jacquemontia sandwicensis</i><br>var. <i>toментosa</i> (Choisy) Hbd. | Beach morning glory; pohuehue<br>Morning glory; koali-'awania<br>Pa'u-o-hi-i-'aka; jacquemontia<br>Pa'u-o-hi-i-'aka | Indigenous<br>Indigenous<br>Endemic<br>Endemic | C<br>KW<br>OSG<br>OSG, C |

| Scientific Name                                            | Common Name(s)                   | Status     | Location   |
|------------------------------------------------------------|----------------------------------|------------|------------|
| <b>PORTULACACEAE (Purslane Family)</b>                     |                                  |            |            |
| * <i>Portulaca cyanosperma</i> Egler                       | Blue-seeded portulaca; 'ihi      | Endemic    | OSG        |
| <i>Portulaca oleracea</i> L.                               | Common purslane; 'ihi            | Exotic     | OSG, KW, D |
| <i>Portulaca grandiflora</i> Hook.                         |                                  | Exotic     | D          |
| <b>SOLANACEAE (Nightshade Family)</b>                      |                                  |            |            |
| <i>Datura stramonium</i> var. <i>tatula</i> (L.) Torr.     | Purple stramonium; kikānia-haole | Exotic     | D          |
| <b>STERCULIACEAE (Cocoa Family)</b>                        |                                  |            |            |
| * <i>Waltheria indica</i> var. <i>americana</i> (L.) R.Br. | Waltheria; hi'aloa; 'uhaloa      | Indigenous | OSG, C, D  |
| <b>UMBELLIFERAE (Carrot Family)</b>                        |                                  |            |            |
| <i>Centella asiatica</i> (L.) Urban                        | Asiatic pennywort; pohekula      | Exotic     | D          |
| <b>ZYGOPHYLLACEAE (Tribulus Family)</b>                    |                                  |            |            |
| * <i>Tribulus cistoides</i> L.                             | Nohu; nohunohu                   | Indigenous | C          |
| <i>Tribulus terrestris</i> L.                              | Puncture vine                    | Exotic     | D (C)      |

\* native Hawaiian species

| Scientific Name                                                 | Common Name(s)               | Status            | Location      |
|-----------------------------------------------------------------|------------------------------|-------------------|---------------|
| <b>LEGUMINOSAE (Pea Family)</b>                                 |                              |                   |               |
| <i>Acacia confusa</i> Merr.                                     | Formosan koa                 | Exotic            | D             |
| <i>Acacia farnesiana</i> (L.) Willd.                            | Klu; kolū                    | Exotic            | D             |
| <i>Cassia fistula</i> L.                                        | Golden shower                | Exotic            | D             |
| <i>Cassia leschenaultiana</i> DC.                               | Partridge pea; laukī         | Exotic            | OSG           |
| <i>Cassia</i> spp.                                              | Shower tree                  |                   | D             |
| <i>Erythrina variegata</i> var. <i>orientalis</i><br>(L.) Merr. | Tiger's claw; wiliwili haole | Exotic            | D             |
| <i>Leucaena leucocephala</i> (Lam.) de Wit                      | False koa; koa-haole         | Exotic            | OSG           |
| <i>Prosopis pallida</i> (Humb. & Bonpl.<br>ex Willd.) HBK.      | Kiawe; mesquite              | Exotic            | OSG, KW, C, D |
| <i>Samanea saman</i> (Jacq.) Merr.                              | Monkeypod; 'ōhai             | Exotic            | D             |
| <b>MALVACEAE (Mallow Family)</b>                                |                              |                   |               |
| * <i>Hibiscus tiliaceus</i> var. <i>tiliaceus</i> L.            | Hau                          | Indigenous        | C             |
| * <i>Sida fallax</i> Walp.                                      | Ilima; 'ilima papa           | Indigenous        | OSG, C        |
| <i>Sida</i> spp.                                                | Ilima                        |                   | OSG, C        |
| <i>Thespesia populnea</i> (L.) Soland.<br>ex Correa             | Portia tree; milo            | Exotic            | C, D          |
| <b>MORACEAE (Mulberry Family)</b>                               |                              |                   |               |
| <i>Ficus benjamina</i> L.                                       | Weeping fig                  | Exotic            | D             |
| <i>Ficus microcarpa</i> L.                                      | Chinese banyan               | Exotic            | D             |
| <i>Ficus</i> spp.                                               |                              |                   | OSG, D        |
| <b>NYCTAGINACEAE (Four o'clock Family)</b>                      |                              |                   |               |
| <i>Bougainvillea</i> spp.                                       | Bougainvillea                | Exotic            | D             |
| <b>PALMAE (Palm Family)</b>                                     |                              |                   |               |
| <i>Cocos nucifera</i> L.                                        | Coconut; niu                 | Polynesian Intro. | C, D          |
| <b>PANDANACEAE (Screw Pine Family)</b>                          |                              |                   |               |
| <i>Pandanus odoratissimus</i> var.<br><i>odoratissimus</i> L.   | Screw pine; hala             | Indigenous        | C, D          |
| <b>POLYGNOMACEAE (Buckwheat Family)</b>                         |                              |                   |               |
| <i>Coccoloba uvifera</i> (L.) L.                                | Sea grape                    | Exotic            | D             |

## APPENDIX F

(2)

### AN AVIFAUNAL AND FERAL MAMMAL SURVEY OF MAUNA KEA PROPERTIES, INC., HAWAII

#### INTRODUCTION

This report summarizes the results of a two day (11-12 Feb. 1984) ornithological and feral mammal field survey of four sites designated for future development at Mauna Kea Properties, Inc., Hawaii. References to an earlier study conducted by P. Bruner for Olohana Properties in 1979, in the general vicinity, and to pertinent literature are also included.

The major objective of the present study was to determine what bird and mammal species occur in the area and at what relative abundance. In addition, special attention was to be directed towards any "endangered" species which might inhabit the study sites and to assess the nature of their dependence on resources within the area.

#### STUDY METHODS AND SITE DESCRIPTIONS

Field observations were made with binoculars and by listening for vocalizations while walking along randomly chosen transects and by conducting eight-minute counts of all birds and mammals seen or heard at regular stations (approximately 75-100 m apart) along these transects.

These eight-minute counts were made in all types of habitat (open grassland, forested gulches, roadsides, and shoreline), at various times throughout the day (but primarily during early morning and late afternoon). Weather throughout both days of the survey was clear with moderate (5-10 mph) easterly winds. Data from the eight-minute counts are the basis for abundance estimates and were also useful in determining trends in distribution patterns and ecological preferences for each species.

#### SITE I - The Uplands at Mauna Kea

This section is located mauka of Queen Kaahumanu Highway and is composed of open grassland and scattered thickets of Kiawe (Prosopis pallida) confined mostly to gulches. The upper (eastern) parts of the property are almost exclusively rolling grasslands.

#### SITE II - The High Bluffs at Mauna Kea

Open grassland with patches of Kiawe forest characterize the habitat. An existing golf course borders the northern edge of the site.

#### SITE III - The Stone Bluffs at Mauna Kea

An existing golf course virtually surrounds this site which is presently covered in Kiawe forest with some open patches of grassland. The northwest edge of the site includes shoreline habitat.

#### SITE IV - The Bluffs at Mauna Kea - Napuna Beach and Tennis Club

The western edge of this parcel is characterized by shoreline and dense Kiawe thickets with more open grasslands in the eastern portions. The general aspect of this site is a much wetter and more densely foliated



(3)

appearance than that exhibited by sites one, two and three.

#### RESULTS AND DISCUSSION

Each of the four study sites will be treated separately in this section of the report. Species composition varied little between sites but relative abundance of each species did fluctuate somewhat, undoubtedly as a function of habitat differences.

#### SITE I

Somewhat surprisingly Japanese Quail (Coturnix coturnix) were found to be the most abundant species at this site (see Fig. 1). This probably was due to the open and extensive nature of the grasslands which characterize the area and provide a suitable habitat for this species. Gray Francolin (Francolinus pondicerianus) were less common than at other sites which contained more Kiawe stands which they seem to prefer. The sighting of four Mourning Doves (Zenaidura macroura), an uncommon species in Hawaii, was also noteworthy. The only observation of a native bird was a Pueo (Asio flammeus sandwichensis). This sighting took place at 7:22 am on 12 February at the southeast edge of the site. The bird was flying low along a fence line searching for prey. It alighted briefly in a Kiawe tree before it continued on to the southeast. Mammals observed at this site included two mongooses (Lepus auro-punctatus) and the tracks of a feral cat.

#### SITE II

Zebra Dove (Geopelia striata), also formerly known as the Barred Dove, and Warbling Silverbill (Lonchura malabarica) were easily the most abundant species,

(4)

with Gray Francolin and Spotted Dove (Streptopelia chinensis) quite common (see Fig. 2). The time of day was important in attempting to determine species abundance as mid-day surveys revealed few Gray Francolin while late afternoon counts turned up many more individuals. This might be due to some daily movement patterns in the population but is more likely the result of greater activity and calling and thus greater detectability at earlier and later times during the day. Nine mongooses were observed on this site.

#### SITE III

Northern Cardinal (Cardinalis cardinalis) was common at this locality due to a greater proportion of the habitat being forested. Zebra Dove and Spotted Dove were also common (see Fig. 3). The close proximity of the moist golf course undoubtedly also accounted for the greater number of Common Myna (Acridotheres tristis) and Japanese White-eye (Zosterops japonicus) which do prefer slightly moister areas with larger trees. Mongoose were common with 11 individuals seen. One feral cat was also observed stalking a Zebra Dove.

#### SITE IV

Warbling Silverbill were very abundant at this site perhaps due to the abundance of large Kiawe trees and tall seedbearing grasses. Gray Francolin and Zebra Dove were also numerous (see Fig. 4). Pacific Golden Plover (Pluvialis fulva), Wandering Tattler (Heteroscelus incanum), and Ruddy Turnstone (Arenaria interpres) were all observed along the rocky shoreline. The exposed shell at low tide serves as an important foraging site for these species. Japanese Quail, so abundant at site one were found in very few numbers at this site. One feral cat along with 15 mongooses was observed during the course of the study at this site.

(5)

#### CONCLUSIONS AND RECOMMENDATIONS

##### General Comments:

An earlier survey conducted in October of 1979 by P. Bruner covered habitat similar and adjacent to the present study sites. A comparison of the species observed on that survey with the current census reveals similar relative abundance estimates for most species but interestingly includes some species such as the Black Francolin (Francolinus francolinus), Mockingbird (Mimus polyglottos), and Saffron Finch (Sicalis flaveola) which were not recorded on this 1984 survey. Also of note is the remarkable increase in Warbling Silverbill between 1979 and 1984. By contrast the present survey reports the presence of the Pueo, Mourning Dove, and Japanese Quail all of which were not observed during the 1979 study. The relative scarcity of Pueo and Mourning Dove partially explains why they were not observed in 1979 but the present abundance of Japanese Quail especially in study Site One is enigmatic and suggests either a remarkable increase in their population or perhaps reflects a lack of detectability due to the fact that the birds were not vocalizing during October of 1979?

##### SITE I

This site supports a significant population of Japanese Quail as well as providing excellent foraging grounds for the native Hawaiian Owl (Pueo). Development such as the proposed golf course and other facilities will virtually eliminate these species from the area as well as significantly reduce the number of Gray Francolin which also rely on natural tall grasses and Kiawe thickets for foraging and cover. Species which could be expected to increase due to habitat alteration by the proposed development include: House Sparrow, Northern Cardinal,

(6)

Common Nyna, and Japanese White-eye. Mongoose and feral cats might also become more common and thus further stress the remaining small numbers of ground nesting birds such as Japanese Quail and Gray Francolin. The indigenous migratory Pacific Golden Plover will be found in small numbers with the creation of short grassy areas along the fairways of the proposed golf course. Presently this species does not occur at this site.

##### SITE II

Both Gray Francolin and Japanese Quail utilize the natural grasslands and occasional Kiawe stands typical of this habitat. Zebra Dove and Warbling Silverbill are abundant. The establishment of a golf course (as presently planned) will significantly reduce the populations of all four of these species. The wetter conditions brought about by the golf course will encourage an increase in the numbers of Common Nyna, Japanese White-eye, and to a lesser degree Northern Cardinal. Pacific Golden Plover, an indigenous migratory species not presently found in the area, will become part of the avifauna once the fairways with their short grass habitat becomes available. This species often establishes winter territories in areas of this sort (Johnson and Bruner, Wintering Behavior and site-faithfulness of Golden Plovers on Oahu, Elepaio 41: (12) 123-130, 1981)

##### SITE III

The dense Kiawe thickets support a number of pairs of Northern Cardinal as well as serves as a roosting site for Zebra and Spotted Dove. Common Nyna also are seen in considerable numbers in this area. The proposed development of residential units will reduce the Northern Cardinal population slightly and will encourage a moderate increase in Japanese White-eye. The few Gray Francolin and Japanese Quail presently in the area will likely be displaced because of

(7)

loss of suitable habitat and secondarily as a result of the likely increase of predators such as cats and dogs that usually follow human settlements.

#### SITE IV

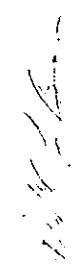
This area provides excellent habitat for a number of species due to the large trees along the coastline and the deep well forested gulches. Development in the form of the proposed hotel and residential units will likely influence the fauna of this site in the following ways: Gray Francolin and Japanese Quail will become very uncommon with the latter perhaps disappearing entirely from the area; Common Myna will increase slightly as will the Japanese White-eye; Northern Cardinal might show a slight decrease in numbers along with Warbling Silverbill. The use of the rocky shoreline at low tide by Ruddy Turnstone and Wandering Tattler and to a lesser degree Pacific Golden Plover could be adversely influenced if development markedly alters the shoreline or exposes it to a substantial increase of human intrusion. The 1979 study, likewise, revealed that this rocky shelf was an important foraging site for shorebirds. In fact the rarely seen Bristle-thighed Curlew was recorded on that survey. Thus it is recommended that an effort ought to be made to see to it that these coastal foraging grounds are not adversely impacted by the proposed development.

#### GENERAL SUMMARY

A wide assemblage of species, mostly exotic, inhabit all four study sites of the proposed development at Mauna Kea Properties, Inc. Of the introduced game birds known from this sector of the island (Mall, Where the Game Birds Are, Helepaio 38: (7) 74, 1978) only the Gray Francolin and Japanese Quail were

(8)

observed during the course of this two day survey. Development of the kinds proposed will reduce the numbers of these game birds while at the same time positively influence the Common Myna, Japanese White-eye and Pacific Golden Plover populations. The major area of concern lies with the effect development might have on the shoreline and thus it is recommended that an effort be made to reduce or avoid adverse impact in this area by insuring limited access to the exposed rocky shelf where shorebirds forage.

  
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21 Feb. 1984

KEY TO FIGURES 1-4

Abundance = Number of times observed during survey or frequency on eight-minute counts.

A = Abundant (ave. on 8 min. count 10+)

C = Common (ave. on 8 min. count 5-10)

U = Uncommon (ave. on 8 min. count less than 5)

R = Recorded but not on 8 min. count. Number that follows is the actual number seen or heard.

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Habitat = Area most frequented. Order of most preferred or utilized begins at left.

G = Grassland (open fields)

K = Kiawe thickets

P = Parkland (mixed grassland and scattered trees)

E = Edge of roads or other breaks in the vegetation

S = Shoreline (exposed rocky shelf)

| COMMON NAME         | SCIENTIFIC NAME                   | RELATIVE ABUNDANCE | HABITAT    |
|---------------------|-----------------------------------|--------------------|------------|
| Gray Francolin      | <i>Francolinus pondicerianus</i>  | U                  | P, K, G, E |
| Japanese Quail      | <i>Coturnix coturnix</i>          | A                  | G, P, E    |
| Lebra Dove          | <i>Geopelia striata</i>           | C                  | P, K, E    |
| Spotted Dove        | <i>Streptopelia chinensis</i>     | U                  | P, K, E    |
| Common Myna         | <i>Acridotheres tristis</i>       | U                  | P, E, K    |
| Japanese White-eye  | <i>Zosterops japonica</i>         | R=6                | K, P       |
| Northern Cardinal   | <i>Cardinalis cardinalis</i>      | R=3                | K          |
| House Sparrow       | <i>Passer domesticus</i>          | R=1                | E, P       |
| Warbling Silverbill | <i>Lonchura malabarica</i>        | C                  | P, K, G, E |
| Hawaiian Owl (Puco) | <i>Asio flammeus sandwicensis</i> | R=1                | P, G, E    |
| Mourning Dove       | <i>Zenaidura macroura</i>         | R=4                | P, G       |

Fig. 1 Relative abundance and habitat preference of birds at SITE 1 - The Uplands at Mauna Kea, Mauna Kea Properties, Inc., Hawaii.

Fig. 2 Relative abundance and habitat preference of birds at SITE II - The High Bluffs at Mauna Kea, Mauna Kea Properties, Inc., Hawaii.

| COMMON NAME         | SCIENTIFIC NAME                  | RELATIVE ABUNDANCE | HABITAT |
|---------------------|----------------------------------|--------------------|---------|
| Gray Francolin      | <u>Francolinus pondicerianus</u> | C                  | P,K,G,E |
| Japanese Quail      | <u>Coturnix coturnix</u>         | U                  | G,P,E   |
| Zebra Dove          | <u>Geopelia striata</u>          | A                  | P,K,E   |
| Spotted Dove        | <u>Streptopelia chinensis</u>    | C                  | P,K,E   |
| Common Myna         | <u>Acridotheres tristis</u>      | U                  | P,E,K   |
| Japanese White-eye  | <u>Zosterops japonica</u>        | U                  | K,P     |
| Northern Cardinal   | <u>Cardinalis cardinalis</u>     | U                  | K       |
| Warbling Silverbill | <u>Lonchura malabrica</u>        | A                  | P,K,G,E |
| Spotted Mannikin    | <u>Lonchura punctulata</u>       | R=15               | G,P     |

Fig. 3 Relative abundance and habitat preference of birds at SITE III - The Stone Bluffs at Mauna Kea, Mauna Kea Properties, Inc., Hawaii.

| COMMON NAME        | SCIENTIFIC NAME                  | RELATIVE ABUNDANCE | HABITAT |
|--------------------|----------------------------------|--------------------|---------|
| Gray Francolin     | <u>Francolinus pondicerianus</u> | R=9                | P,K,G,E |
| Japanese Quail     | <u>Coturnix coturnix</u>         | R=5                | G,P,E   |
| Zebra Dove         | <u>Geopelia striata</u>          | C                  | P,K,E   |
| Spotted Dove       | <u>Streptopelia chinensis</u>    | C                  | P,K,E   |
| Common Myna        | <u>Acridotheres tristis</u>      | C                  | P,E,K   |
| Japanese White-eye | <u>Zosterops japonicus</u>       | U                  | K,P     |
| Northern Cardinal  | <u>Cardinalis cardinalis</u>     | C                  | K       |
| Spotted Mannikin   | <u>Lonchura punctulata</u>       | U                  | G,P     |

Fig. 4

Relative abundance and habitat preference of birds at SITE IV - The Bluffs at Mauna Kea and Hapuna Beach and Tennis Club, Mauna Kea Properties, Inc., Hawaii.

| COMMON NAME           | SCIENTIFIC NAME                  | RELATIVE ABUNDANCE | HABITAT |
|-----------------------|----------------------------------|--------------------|---------|
| Gray Francolin        | <u>Francolinus pondicerianus</u> | C                  | P,K,G,E |
| Japanese Quail        | <u>Coturnix coturnix</u>         | R= 2               | G,P,E   |
| Zebra Dove            | <u>Geopelia striata</u>          | C                  | P,K,E   |
| Spotted Dove          | <u>Streptopelia chinensis</u>    | U                  | P,K,E   |
| Common Myna           | <u>Acridotheres tristis</u>      | C                  | P,E,K   |
| Japanese White-eye    | <u>Zosterops japonica</u>        | C                  | K,P     |
| Northern Cardinal     | <u>Cardinalis cardinalis</u>     | U                  | K       |
| House Sparrow         | <u>Passer domesticus</u>         | R= 5               | E,P     |
| Warbling Silverbill   | <u>Lonchura malabrica</u>        | A                  | P,K,G,E |
| Pacific Golden Plover | <u>Pluvialis fulva</u>           | R= 3               | S       |
| Wandering Tattler     | <u>Heteroscelus incanus</u>      | R= 5               | S       |
| Ruddy Turnstone       | <u>Arenaria interpres</u>        | R= 14              | S       |

APPENDIX G

PAUL H. ROSENDAHL, Ph.D., Inc.  
*Consulting Archaeologist*

Report 199-092585

**ARCHAEOLOGICAL RECONNAISSANCE  
INTENSIVE SURVEY AND TESTING  
SOUTHERNMOST PORTION  
SOUTH KOHALA RESORT**

**Land of Ouli**

**South Kohala, Island of Hawaii**

May 1987

ARCHAEOLOGICAL RECONNAISSANCE, INTENSIVE SURVEY, AND TESTING  
SOUTHERNMOST PORTION  
SOUTH KOHALA RESORT

Land of Ouli  
South Kohala, Island of Hawaii  
(TMK:3-6-6-02:37; 3-6-2-02:12)

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May 1987

SUMMARY

An archaeological reconnaissance, intensive survey, and testing of the southernmost portion of South Kohala Resort project area was conducted by Paul H. Rosendahl, Ph.D., Inc., during the periods of September 11-13 and 17-20, 1985, under agreement with Belt, Collins & Associates for their client, Mauna Kea Properties, Inc. The area consists of two parcels totaling c. 95.2 ac in the Land of Ouli, South Kohala, Island of Hawaii (TMK:3-6-6-02:37; 3-6-2-02:12).

The reconnaissance survey consisted of 100% coverage of the entire 95.2 ac project area. Twenty-five sites (28 component features) were identified within the overall project area. Of these, six sites had been previously recorded, and 19 sites were newly identified. The range of formal feature types encountered includes platform/enclosure, L-shaped terrace, L-shaped wall segment, wall segment, surface artifact/midden concentration, trail, road, terrace wall, double C-shape, C-shape, rectangular mound, cairn, boulder alignment, recent historic refuse, and historic wooden structure. For most of these sites, the reconnaissance survey accomplished an adequate and appropriate level of data recovery; thus, no further archaeological work was believed justified. Specific exceptions to this evaluation were Sites T-104 (Feature A), T-120, 50-10-11-5629, and Trail 9 (Site 50-10-05-5666).

Consideration of the reconnaissance survey results indicated that additional intensive survey and test excavations should be undertaken prior to construction activities, for two newly identified sites: T-104 (Feature A) and T-120. With the approval of the Hawaii County Planning Department, the intensive survey and testing results were combined with those of the previously conducted reconnaissance, for purposes of analysis and reporting. Data recovered from Sites T-104 (Feature A) and T-120 constituted adequate and sufficient recovery of archaeological data present, and no additional work or physical preservation was considered necessary.

Previous recommendations have been made with regard to two sites: 50-10-11-5629 and Trail 9 (Site 5666). Additional intensive survey, test excavations, and temporary preservation with some level of interpretive development have been recommended for the portions of Site 50-10-11-5629 (Kaunaoa Point Complex) that are within the present project area; however, such testing could be postponed until further work on the entire complex is undertaken. Trail 9 (Site 5666) has been recommended for preservation, with some level of interpretive development, for its value in connection with the Kaunaoa Point Complex.



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## INTRODUCTION

### BACKGROUND

This report presents the results of archaeological reconnaissance, intensive survey, and testing in the southernmost portion of South Kohala Resort project area, in the Land of Ouli, South Kohala, Island of Hawaii (TMK:3-6-6-02:37; 3-6-2-02:12). The archaeological investigations were carried out by Paul H. Rosendahl, Ph.D., Inc. (PHRI) at the request of Belt, Collins & Associates for their client, Mauna Kea Properties, Inc. The investigations were conducted to determine the nature and extent of archaeological remains on the property for the purpose of development planning. Approximately 131 man-hours of labor were expended in conducting the field work.

Upon completion of field work, Principal Investigator Dr. Paul H. Rosendahl and PHRI Field Archaeologist Alan T. Walker met with Virginia Goldstein, staff planner and historic sites specialist in the Hawaii County Planning Department, to discuss field findings and preliminary conclusions--including tentative evaluations and recommendations (September 16 and 23, 1985). Written preliminary reports summarizing this information were submitted in September 1985 to Glen T. Koyama of Belt, Collins & Associates and to Mauna Kea Properties (Rosendahl 1985a, b). This document comprises the final report for the archaeological investigations.

### SCOPE OF WORK

The basic purpose of an archaeological reconnaissance survey is to identify--to discover and locate on available maps--sites or features of possible archaeological significance. A reconnaissance survey is simply a pedestrian, or walk-through, survey--extensive rather than intensive in scope--conducted to determine the presence or absence of archaeological resources within a specified project area. Reconnaissance survey indicates the general nature and variety of archaeological remains present and the general distribution and density of such remains. A reconnaissance survey permits a preliminary evaluation of the archaeological resources and facilitates formulation of realistic recommendations and estimates for such further archaeological work as might be necessary or appropriate. Such further work could include intensive survey--detailed recording of sites and features, and selected test excavations; and possibly subsequent mitigation--salvage research excavations, interpretive planning and development, and/or preservation of sites and features with significant scientific research, interpretive, and/or cultural values.

The basic objective of the reconnaissance survey at the southernmost portion of South Kohala Resort was to identify and evaluate sites and features of potential archaeological significance present within TMK:3-6-6-02:37 and 3-6-2-02:12. Based on a review of available records and information, the following specific tasks were determined to constitute an adequate scope of work for the reconnaissance survey:

1. Conduct a 100% coverage, ground reconnaissance survey of the c. 95.2-ac project area;
2. Determine which portions of the project area do not contain any sites of possible archaeological significance and for which archaeological clearance could be recommended;
3. Determine which specific sites or portions of the project area contain archaeological remains of potential significance and for which further archaeological work might be appropriate and/or required;
4. Make preliminary evaluations of the potential value of all archaeological remains identified within the project area;
5. Make specific recommendations and man-hour estimates for any further archaeological work that might be appropriate and/or required; and
6. Analyze data and prepare written preliminary and final reports.

The reconnaissance survey was to be conducted in accordance with the standards for reconnaissance-level survey recommended by the Society of Hawaiian Archaeology (SHA). These standards are currently being used by the Hawaii County Planning Department as guidelines for the review and evaluation of archaeological reconnaissance survey reports submitted in conjunction with various development permit applications.

Based on the reconnaissance survey findings, archaeological remains found within the southernmost portion of South Kohala Resort appear to be, for the most part, of limited significance in terms of potential scientific research, interpretive and cultural values. For these sites, the reconnaissance survey accomplished an adequate and appropriate level of data recovery, and thus no further archaeological work of any kind was believed necessary or justified. Specific exceptions to this general evaluation are Sites 50-10-11-5629, \* Trail 9 (Site 50-10-05-5666), T-104 (Feature A), and T-120.

\*Hawaii Register of Historic Places (HRHP) site designation system: four-digit site numbers prefixed by 50-10-11- or 05- (50-State of Hawaii; 10-Island of Hawaii, 11 or 05-UNAS 7.5' series quad map [Upou Uluai, Hawaii] or "Kawaihāe, Hawaii," respectively).

## PROJECT AREA DESCRIPTION

The project area consists of two parcels totaling c. 95.2 ac in the Land of Ouli, South Kohala District, Island of Hawaii (Figure 1). The two parcels are separated by the old Kawaihae-Puako Road (Road 10) (Kaschko and Rosendahl 1982), which is oriented north-south and which divides the project area into a seaward parcel of c. 32.69 ac (TKK:3-6-6-02:37) and a larger, inland parcel of c. 62.51 ac (TKK:3-6-2-02:12). Located at the southernmost end of South Kohala Resort, the two parcels are bound by Queen Kaahumanu Highway to the east, by state land and Hapuna Beach State Park to the south, by the Mauna Kea Beach Resort Golf Course and private residential lots to the north, and by the Pacific Ocean to the west. The project area rises in elevation from c. 5 to 300 ft above sea level. The terrain is an undulating surface of low hills and gullies, with a soil mantle of Kawaihae Series extremely stony, very fine sandy loam, 6 to 12 percent slopes (Sato et al. 1973). Average annual rainfall is c. 10 inches (Armstrong 1973:57).

Present vegetation cover varies in density from sparse to moderate and consists primarily of the introduced exotic kiawe (*Prosopis pallida* Humb. and Bonpl. ex Willd.) HBK.), the native shrub *ilima* (*Sida fallax* Walp.), and various grasses. The immediate coastal zone of the project area, specifically the picnic area behind Hapuna Beach, contains an overstory of hau (*Hibiscus tiliaceus* L.), mulo (*Thespesia populnea* L.), niu (coconut palm [*Cocos nucifera* L.]), monkeypod (*Samanea saman* [Jacq.] Merr.), banyan (*Ficus* sp.), and false kamani (*Terminalia catappa* L.), with a ground cover of *naupaka-kahakai* (*Scaevola sericea* Vahl) and *bougainvillea* (*Bougainvillea* sp.).

The Land of Ouli was originally claimed by and awarded to James Y. Kanehoa (listed as M. Kanehos [Indices 1929:408]) (LCA 8518-B:1, RP 2237) and included a smaller, separate claim awarded to Kakaai (LCA 4199:1, RP 4943), which does not appear to be situated within the present project area.

## PREVIOUS ARCHAEOLOGICAL WORK

Archaeological work conducted most recently within the present project area, in conjunction with limited preliminary research (Rosendahl 1981), includes a reconnaissance survey focusing upon identification of historic and prehistoric trails within Mauna Kea Properties (c. 3,860 ac in area), conducted in June 1982 by PHRI for Mauna Kea Properties (Kaschko and Rosendahl 1982). The purpose of that field work was to locate, identify and plot on available maps all historic and prehistoric trails within the project area. Kaschko and Rosendahl identified and recorded 10 trails/roads with observable physical remains within the project area. Two of these sites (Trail 9, Road 10), in addition to three catlins (no formal site numbers), are situated within the present project area. Subsequently, Trail 9 was designated by Kaschko and Rosendahl as URHP site

Site 50-10-11-5629 (Kaunaoa Point Complex) has already been determined to have high research and interpretive values, as well as moderate cultural value, and a program of short-term preservation, research excavations, and interpretive development has previously been recommended (Rosendahl and Kaschko 1983). With regard to Features F, H, and I at Site 5629, which are situated within the present project area, the immediate course of appropriate action recommended would be to conduct intensive survey test excavations; however, such testing could be postponed until further work on the entire site complex is undertaken.

Previously identified Trail 9 (Site 5666), a coastal foot trail, was believed to have moderate research and cultural values, as well as high interpretive value, in connection with Kaunaoa Point Complex (Site 5629) and other sites and complexes located along the trail within the Ouli coastal lands. Preservation of the trail was therefore recommended in light of these values and based on the likelihood that preservation of the trail will be required for the purpose of public shoreline access.

Preliminary consideration of the reconnaissance survey results indicated that additional archaeological work in the form of intensive survey and test excavations should be undertaken at newly identified Sites T-104 (Feature A) and T-120, prior to construction activities. With the approval of the Hawaii County Planning Department, the results of the intensive survey and test excavations at these two sites were combined with results from the previously conducted reconnaissance survey, for purposes of analysis and reporting.

The basic objective of intensive archaeological survey and testing is to recover archaeological data sufficient to determine and document the significance of archaeological remains. Based on the preceding reconnaissance survey (Rosendahl 1983a) and on a discussion with Ms. Goldstein (September 16, 1985), the following specific tasks were determined to constitute an adequate scope of work for the intensive survey:

1. Intensive-level recording of Sites T-104 (Feature A) and T-120--including detailed plan mapping, surface profiles, written descriptions, and photographs;
2. Subsurface testing of Sites T-104 (Feature A) and T-120;
3. Limited subsurface reconnaissance auger core test excavations, along the base of the steep bedrock bluff at the back of Hapuna Beach, to determine the presence or absence of any potentially significant buried cultural deposits or features;
4. Analysis of recovered data; and
5. Preparation of written preliminary and final reports.

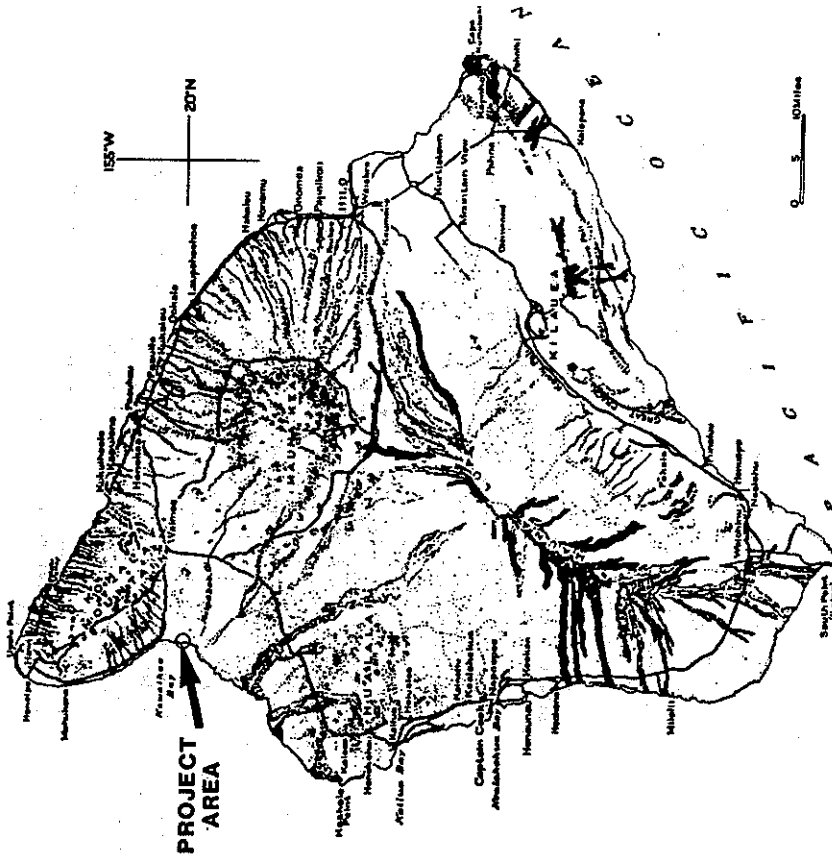


Figure 1. PROJECT LOCATION MAP

Archaeological Reconnaissance, Intensive Survey, and Testing

Southernmost Portion

South Kohala Resort

Land of Ouli, South Kohala, Island of Hawaii

(TRK:3-6-6-02:37; 3-6-2-02:12)

PHRI Project 85-199

September 1985

(Map taken from Macdonald and Abbott 1970:288.)

number 50-10-05-5666, while the cairns were temporarily designated Sites T-113 through -115 during the present project. A third trail, Trail 8 (50-10-05-5665), identified by Kaschko and Rosendahl (1982), is visible inland (east) of Queen Kaahumanu Highway. Trail 8 (Site 5665) is a coastal-inland oriented foot trail situated along the boundary between the Lands of Ouli and Lalaimilo, but it is also visible within the present project area. No general recommendations were made concerning further archaeological work.

Kaunaoa Point Complex (Site 50-Ha-E4-14\*) was initially identified and inspected for Olohana Corporation in December 1967 by Lloyd J. Soehren of B.P. Bishop Museum (Soehren 1967). The purpose of that field work was to examine archaeological features discovered during clearing work in preparation for topographic mapping in the area between Hapuna Bay and Kaunaoa Bay. In an open midden area (Site 5629, Feature I), Soehren excavated a 1.0-m-sq test unit to a depth of c. 25 cm; the excavation yielded a limited amount of portable remains, including several indigenous artifacts. Based on his findings, Soehren recommended that further archaeological work, in the form of salvage research excavations, be conducted.

Subsequent to Soehren's survey, Paul H. Rosendahl conducted an archaeological survey of Ouli coastal lands between Hapuna Bay and Kaunaoa Bay for Bishop Museum, including excavations at Kaunaoa Point Complex (Site 5629) (Rosendahl 1969). The purpose of this survey was to identify and record archaeological sites within the project area and to evaluate them and make recommendations concerning their preservation and eventual incorporation of appropriate sites into the landscaping of future resort development. During this survey, portions of Kaunaoa Point Complex (Site 5629)--specifically the area of Features A, B, C, and D--were extensively tested; they yielded a moderate amount of portable remains, including marine shell midden and indigenous artifacts. Based on his findings, Rosendahl suggested, as the next appropriate course of action, interpretive development in the form of stabilization, restoration and interpretation.

In January 1980, Archaeological Research Center, Hawaii (ARCH) conducted an archaeological reconnaissance survey of lands (including the present project area) being considered for golf course expansion by Mauna Kea Land Corporation (Ching and Hamatt 1980). Approximately 18 archaeological sites were identified between Kaunaoa Bay and Kaunaoa Point, but with the exception of Kaunaoa Point Complex (Site 5629), no additional sites were identified within the present project area. Based on previous archaeological work and on the reconnaissance survey, ARCH recommended "[a]rchaeological testing combined with selective excavation of sites (15 total) in the coastal portion" (1980:3) to accomplish an adequate recovery of archaeological data.

\*B.P. Bishop Museum (BPRM) site designation system: all site numbers prefixed by 50-Ha-E4- (50-State of Hawaii; Ha-Island of Hawaii; E-South Kohala District; 4-Land of Ouli).

Subsequent to the reconnaissance survey, ARCH conducted archaeological survey and test excavations along the coast between Kaunaoa Point and Kaunaoa Bay in the Land of Ouli (Hammatt and Folk 1980). Twenty-one sites and site complexes were identified, and test excavations of varying extent were carried out at 16 of these. Kaunaoa Point Complex (Site 5629), Features A and F, were identified and were redesignated Sites 8019 and 7999, respectively, but they were not excavated (Hammatt and Folk 1980: 42-45). Based on the findings of their survey and test excavations, ARCH stated that no further archaeological work was justified, with the exception of Site 8001 (situated outside the present project area), for which they recommended complete excavation.

In early 1981, a detailed review of Hammatt and Folk (1980) by the Hawaii County Planning Department revealed several substantial problems. At the request of Mauna Kea Properties, PHRI conducted additional intensive survey and test excavations in December 1981 in the coastal portion of the Land of Ouli, between Hapuna Bay and Kaunaoa Bay, at Mauna Kea Beach Resort (Rosendahl and Kaschko 1983). The purpose of the intensive survey and testing was to determine and document the archaeological significance of sites present within the specified project area. Thirty-seven sites with c. 80 component features were identified and recorded during the intensive survey. Of these, Features F, H, and I of the Kaunaoa Point Complex (Site 5629) are located within the present project area. Of the 37 sites identified, 15 were selected for subsequent testing. The Kaunaoa Point Complex (Site 5629) had been tested previously (Rosendahl 1969) and yielded good potential for eventual research excavations; therefore, it was excluded from consideration for testing. Based on a review of previous archaeological work and intensive survey findings, Kaunaoa Point Complex (Site 5629) was considered to have high research and interpretive values and was recommended for short-term preservation, further excavations and eventual interpretive development (Rosendahl and Kaschko 1983:101).

Archaeological work conducted previously within the general vicinity of the present project area includes (a) a reconnaissance survey of Kaunaoa Beach area and reconnaissance survey and testing by Soehren of sites situated along the shores of Ouli and Kawaihae (1963, 1964), (b) survey and excavations by Apple in the vicinity of Kaunaoa Beach (1964), and (c) a limited reconnaissance survey by Kikuchi of the Kaunaoa Beach area (n.d.).

#### SUMMARY OF HISTORICAL DOCUMENTARY RESEARCH

Historical documentary research was carried out by Historical Researcher Carol L. Silva (1981, 1982) in conjunction with, and as recommended by, preliminary archaeological research work done by PHRI in November 1981 (Rosendahl 1981) for Mauna Kea Properties. Included in her 1981 report are references to early history (pre-European contact), land history, and accounts of voyagers, missionaries and travelers. Her report is briefly summarized here.

Early historic accounts include one by native historian Samuel S. Kamakau (1961), in which he describes a battle between two chiefs, Ke-kau-like of Maui and Alapa'i of Kona. The battle began in Kona, but eventually passed through the Kekaha and Kawaihae areas. As Ke-kau-like fled, he terrorized people and cut down all the coconut (niu) trees. Alapa'i, the winner of the battle, ultimately moved to Kikako'i in Kawaihae to live out his last days. In the heiau of Mailekiki, Kawaihae, he appointed his son Keawe'opala to succeed him as ruler of the island.

Accounts of early voyagers, including Arago (1823), Cleveland (1886), Kotzebue (1821) and others, indicate Kawaihae was a popular anchorage and a heavily traveled area, important in terms of politics, economics and religion. English missionary William Ellis (1963), while at Kawaihae c. 1822-1823, described Puukohola Heiau and the much-traveled Kawaihae-Waimea route used in transporting sandalwood to the coast.

The general land history presented by Silva indicates the entire Lands (anupua'a) of Kawaihae and Ouli were rewards given to John Young by Kamehameha I for assistance and services rendered in battle (Foreign Register n.d.). Eventually, upon the death of John Young, the Land of Ouli was passed to his son, James Y. Kanehoa. The Land of Ouli was retained by Kanehoa (LCA 8618-B:1, RP 2237) during the Great Mahele (c. 1849).

A second, smaller claim (2.65 ac) within the Land of Ouli was awarded to Kaikai (LCA 4199:1, RP 4943). A check of cartographic sources in the State Survey Division revealed four maps of the Ouli-Kawaihae area: a 1903 map by A.E. Loebenstein, a preliminary draft of a USGS quadrant map prepared prior to 1916, the final USGS map, and a map done in 1928 and 1929 by W.E. Wall and C.L. Murray. The Wall and Murray map showed a coastal-inland oriented foot trail along the boundary between the Lands of Ouli and Lalamilo. The trail is present inland (east) of the present project area and is designated Trail 8 (Kaschko and Rosendahl 1982).

A second, historical documentary search by Silva (1982) was conducted to determine whether additional data existed on land ownership (specifically, data on established native trails) in the Kawaihae-Ouli area. Included in her 1982 report are references to Native and Foreign Registers and Testimonies, land files, early tax records, and the General Roads file. The Native and Foreign Registers and Testimonies contain the earliest records of land claims on parcels awarded during the Great Mahele. Included are listings of land claimants, LCA numbers, land uses, and translations of original registered claims.

The land file includes a listing of available correspondence relating to lands in the Kawaihae-Ouli area. The correspondence provides individual names of those who possibly had an interest in land or land issues in this area and includes a method of monitoring land transactions.

Tax records in the South Kohala District began as early as 1855. The tax records include the number of individual taxpayers, horses, dogs,

mules and asses in South Kohala and Kawaihae Kai, in addition to information on real estate assessment and taxation. Taxation and assessment began in 1859 and are probably dependable references to land ownership and tenancy in Kawaihae and Ouli. The General Roads file contains citations of official correspondence pertaining to work on roads within the South Kohala District. The citations consist primarily of correspondence between the Minister of the Interior and various individuals and discusses construction, repair and/or financing of roads.

#### FIELD METHODS AND PROCEDURES

Archaeological reconnaissance, intensive survey, and test excavation field work was carried out during September 11-13 and 17-20, 1985, by a two- to three-man field team. Both phases of field work were conducted under the overall direction of Principal Investigator Dr. Paul H. Rosendahl and the on-site supervision of PHRI Archaeologist Alan T. Walker. Crew members included PHRI Assistant Archaeologists Rodney T. Fujii and Richard A.K. Gilman.

The reconnaissance survey consisted of 100% coverage ground reconnaissance of the entire 95.2 ac project area. Seventy-two man-hours of labor were expended in the course of field work. The ground reconnaissance survey field work consisted of a series of north-south pedestrian sweeps, with distances between crew members varying from 15 to 20 m, depending upon density of vegetation cover and on local terrain. The approximate locations of all identified sites were plotted on a blue-line copy of a topographic map (1:100, 2-ft contours), with the assistance of a blueprint copy map (1:200) made from an aerial photograph of the general area, prepared earlier for Mauna Kea Properties.

Each newly identified site was described on a standard PHRI site survey record form and was photographed in 35 mm black-and-white (PHRI Roll No.378). Sites were assigned temporary field numbers prefixed by "WT," beginning with T-101. Previously recorded sites were labeled with the appropriate site number. Each site, or the primary feature within a site complex, was marked with red and blue flagging tape and with an aluminum tag bearing the site number, date, PHRI reconnaissance project number (85-197), and the letters "PHRI." Flagging tape bearing the site number was wrapped around a rock and placed on the site as an aid to re-identification.

Intensive survey of Sites T-104 (Feature A) and T-120 included detailed plan mapping, test excavations, written descriptions, and photographs. Fifty-nine man-hours of labor were expended in the course of field work. Both sites were mapped with metric tape and compass at a scale of 1:100, and a complete photographic record (35 mm black-and-white) was made of the intensive survey and test excavations field work (PHRI Roll No.380). In addition to selected surface profiles, selected cross-sections of excavated test units were recorded.

#### FINDINGS

Twenty-five sites (28 component features) were identified within the overall project area. Of these, six sites (eight component features) had been previously recorded, and 19 sites (20 component features) were newly identified. The range of formal feature types encountered included platform/enclosure, L-shaped terrace, L-shaped wall segment, wall segment, surface artifact/midden concentration, trail, road, terrace wall, double C-shape, C-shape, rectangular mound, cairn, boulder alignment, recent historic refuse, and historic wooden structure. Locations of all sites, newly and previously identified, are shown on Figure 2 (at end).

The sites identified within the project area (including functional interpretations) can be summarized, in terms of general distribution, as follows:

TMK:3-6-2-02:37. Thirteen sites (16 component features), with Sites 5629, Trail 9 (Site 5666), T-101 through -108, and T-120 through -122 tentatively assigned habitation, foot trail, recent foundation wall, and walled shelter functions; and

TMK:3-6-2-02:112. Twelve sites (12 component features), with Road 10 and Sites T-109 through -119 tentatively assigned road, walled shelter and boundary marker functions.

Table 1 (at end) summarizes the identified sites and their component features with respect to formal type, tentative functional interpretation, preliminary evaluation of site significance, and recommended immediate action.

#### SITE DESCRIPTIONS

##### T-101 Terrace Wall

This terrace wall measures c. 25.8 by 1.2 m in area and is 0.45 to 1.0 m high (Figure 3). It is faced on the downslope side and is constructed of well-stacked, subangular basalt boulders. The terrace wall provides the foundation for a level soil area upon which a rectangular concrete slab is constructed. With the exception of coral pebbles associated with the terrace and level soil area, no cultural deposit is visible on or near the surface of this structure. Several features identical in form are situated in this portion of the project area and probably functioned as foundations for recent historic structures. These additional historic structures were not flagged or formally designated as archaeological sites.

199-092585

T-102 Terrace Wall

This terrace wall measures c. 11.8 by 0.9 m in area and is 0.6 m high. It is faced on the downslope side and is constructed of well-stacked, sub-angular basalt boulders. The terrace wall is oriented along a road or bulldozer cut and supports an adjacent soil embankment. Several features identical in form are situated in this portion of the project area, but they were not flagged or formally designated as archaeological sites. This terrace wall is probably historic and is probably associated with other recent structures. No cultural deposit is visible on or near the surface of this wall.

T-103 Terrace Wall

This terrace wall measures c. 14.0 by 0.8 m in area and is 0.8 m high. It is faced on the downslope side and is constructed of well-stacked, sub-angular basalt boulders. The terrace wall provides the foundation for a level soil area upon which a concrete and rock barbecue is constructed. Several features identical in form are situated in this portion of the project area, but they were not flagged or formally designated as archaeological sites. This terrace wall is probably historic in nature and is probably associated with other recent structures. No cultural deposit is visible on or near the surface of this wall.

T-104 Complex

This complex consists of two features. Feature A, a C-shaped walled shelter, contains a central wall dividing the structure into two "rooms," forming a double C-shape (Figure 4). It measures c. 8.4 by 3.4 m in area, with walls c. 0.7 to 1.7 m wide by c. 0.3 to 0.8 m high. Feature A opens to the west and is located on a low rise c. 70 ft (21.3 m) above mean sea level (MSL). The walls are raised but not formally faced and are constructed of crudely stacked, subangular basalt boulders. Portable remains recorded on the soil surface of Feature A include sparse to moderate amounts of *Cypraea* spp., *Merita picca Cellana* spp., *Thaididae*, *Teretridae*, *Cymatiidae*, *Littorina pintoide*, *Conus* sp., coral, and a waterworn basalt cobble.

Feature A appears to be a walled habitation shelter. Subsequently, PHRI excavated two test units in Feature A; one in the interior soil area of the north "room," partially extending into the shelter wall, and one in the interior soil area of the south "room."

Feature B, a collapsed C-shape, is located c. 35 m northwest of Feature A. The collapsed C-shape opens to the southwest and measures c. 4.6 sq m in area, with walls 0.2 to 0.4 m high. The wall is constructed of piled, subangular basalt boulders and has a single upright boulder on the interior side. Portable remains recorded on the soil surface of Feature B include sparse amounts of *Cypraea* spp., *Cellana* spp., *Thaididae*, coral and a few waterworn basalt cobbles, in addition to a square wooden

199-092585



Figure 3. SITE T-101, TERRACE WALL. View to north. (PHRI Neg. 378-25)

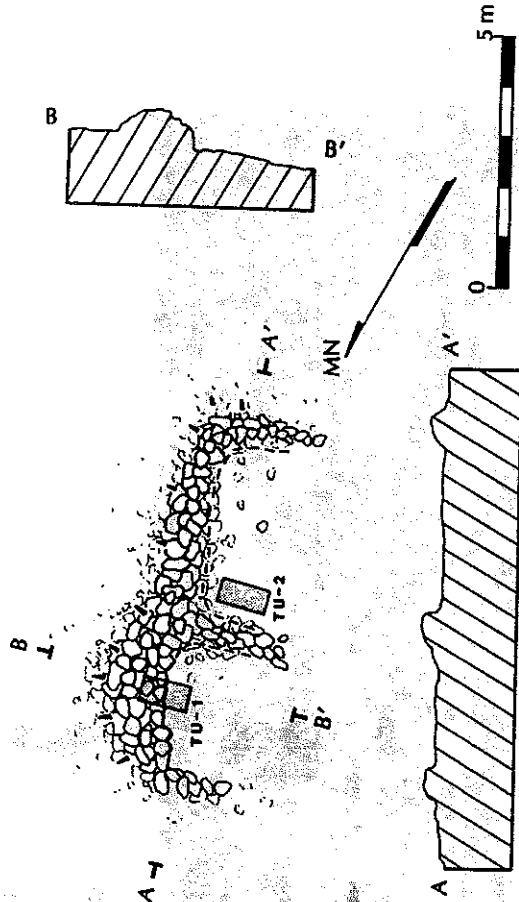


Figure 4  
Site T-104  
Feature A

This L-shaped wall opens to the east and measures c. 4.7 (NW-SE) by 2.9 m (NE-SW); it is 0.35 m high. The walls are raised but not faced, are sloping in profile, and are constructed of piled subangular basalt boulders. This structure appears to be a walled shelter recently altered by WWII military training activity or by bulldozing activity, as evidenced by a metal can (possibly military ration) and an adjacent, artificially scraped surface. Portable remains recorded on the soil surface include very sparse amounts of *Cypraea* spp., *Conus* sp., and *Thauidae*.

T-105 L-shaped Wall

This L-shaped wall opens to the east and measures c. 4.7 (NW-SE) by 2.9 m (NE-SW); it is 0.35 m high. The walls are raised but not faced, are sloping in profile, and are constructed of piled subangular basalt boulders. This structure appears to be a walled shelter recently altered by WWII military training activity or by bulldozing activity, as evidenced by a metal can (possibly military ration) and an adjacent, artificially scraped surface. Portable remains recorded on the soil surface include very sparse amounts of *Cypraea* spp., *Conus* sp., and *Thauidae*.

T-106 Rectangular Mound

This rectangular-shaped mound is located c. 17.3 m southeast of Site T-105 and measures c. 6.3 by 4.2 m in area; it is 0.45 m high (Figure 5). The mound is constructed of piled, subangular basalt boulders and is raised slightly on the northwest and southeast sides. The surrounding soil area appears to have been artificially scraped, and bulldozer tracks appear on the surface of the structure. Portable remains recorded within Site T-106 include several fragments of *Cypraea* spp., *Callana* sp., and *Thauidae*. This structure may possibly have been a low terrace or platform later altered by bulldozing activity.

T-107 C-shape

This C-shaped structure is open to the north and measures c. 3.3 by 1.4 m in area, with a wall 0.55 m wide by 0.55 m high. The wall is raised, but is not formally faced; it is constructed of stacked, subangular basalt boulders on a soil surface near the base of a low rise. Portable remains recorded within Site T-107 include a plastic bottle and rubber- or plastic-insulated wire, but no marine shell. This structure appears to be a WWII military training shelter.

T-108 Collapsed C-shape

This collapsed C-shape is open to the south and measures c. 3.3 by 2.4 m in area; the wall is 0.5 m wide and 0.3 to 0.35 m high. It is in poor condition and is constructed of piled, subangular basalt boulders that are raised but not formally faced. No portable remains are visible on or near the structure, which is probably a temporary shelter.

A low mound of rocks (no feature designation) is located c. 18.0 m northwest of Site T-108. The mound is generally rounded or sloping in profile and measures c. 0.65 by 0.6 m in area and 0.35 m high.

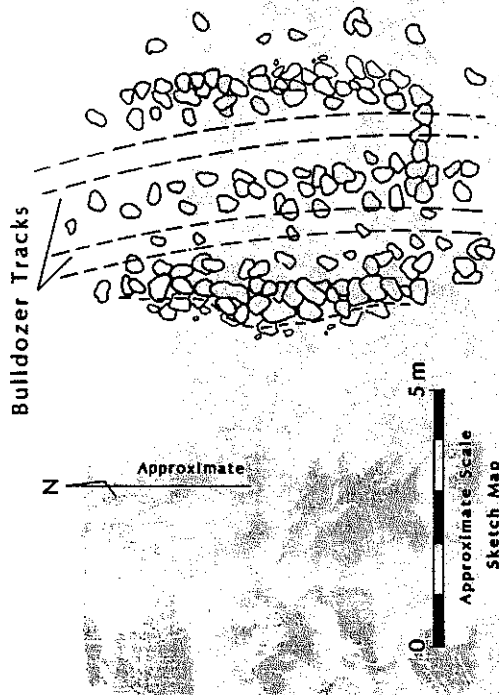
T-109 C-shape

This C-shaped structure is open to the north and is in fair condition (Figure 6). It measures c. 2.4 by 2.3 m in area, and the wall is 0.5 m wide and 0.15 to 0.6 m high. The wall is raised, but not formally faced, and is constructed of stacked, subangular basalt boulders on a soil surface that overlooks a shallow gully. No portable remains are visible on or near the structure. Site T-109 is possibly a temporary shelter.

T-110 Cairn

This cairn measures c. 0.5 by 0.25 m in area and is 0.55 m high. It is roughly cone-shaped and is constructed of subangular basalt boulders stacked three to four courses high; it is in fair condition. The cairn is





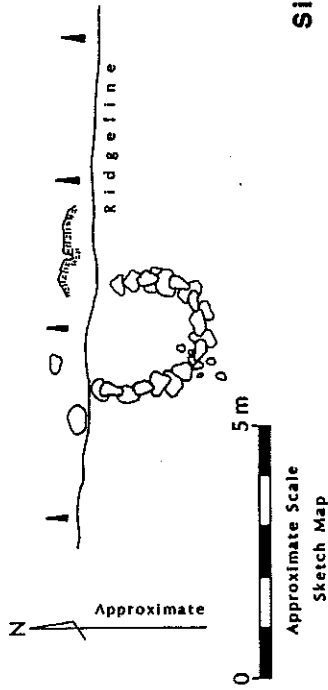
**Figure 5**  
**Site T-106**

situated near the Ouli and Lalamilo shupua'a boundary, but no trail or portable remains are visible in this area. Site T-110 may function as a boundary marker.

Located c. 18.0 m west of Site T-110 are two boulders (no feature designation), one stacked upon the other, measuring c. 0.4 by 0.15 m in area and 0.4 m high.

**T-111 Cairn**

This cairn measures c. 1.3 by 0.25 m in area and is 0.45 m high. It is linear-shaped and is constructed of subangular basalt boulders stacked two to three courses high; it is in poor condition. No trail and no portable remains are visible in this area. The cairn appears to be an isolated feature, and its function is undetermined.



**Figure 6**  
**Site T-109**

**T-112 Cairn**

This cairn measures c. 1.2 by 0.9 m in area and is 0.7 m high. It is roughly square-shaped and is constructed of stacked, subangular basalt boulders; it is raised, but is not formally faced.

The cairn contains a wooden pole supported by metal wire, and a 1/2-inch metal pipe and a wooden stake are located 4.0 m northeast. The cairn appears recently constructed and is situated on the Ouli and Lalamilo shupua'a boundary; it is probably a surveyor or property boundary cairn.

**T-113 Cairn**

This cairn measures c. 1.1 by 0.75 m in area and is 0.8 m high (Figure 7). It is roughly rectangular in shape and is constructed of crudely faced, stacked subangular basalt boulders. The cairn, situated near the Ouli and Lalamilo shupua'a boundary, is in fair condition and probably functioned as a boundary marker. No trail and no portable remains are visible in this area. Site T-113 was initially recorded by Kaschko and Rosendahl (1982), but it was not assigned a formal site number. Sites T-113, -114, and -115 form a rough northeast-southwest alignment.

**T-114 Cairn**

This cairn measures c. 1.3 by 1.0 m in area and is 0.95 m high. The cairn is roughly cone-shaped and is constructed of crudely stacked subangular basalt boulders, but it is not formally faced. It is in fair condition and is situated near the Ouli and Lalamilo shupua'a boundary;

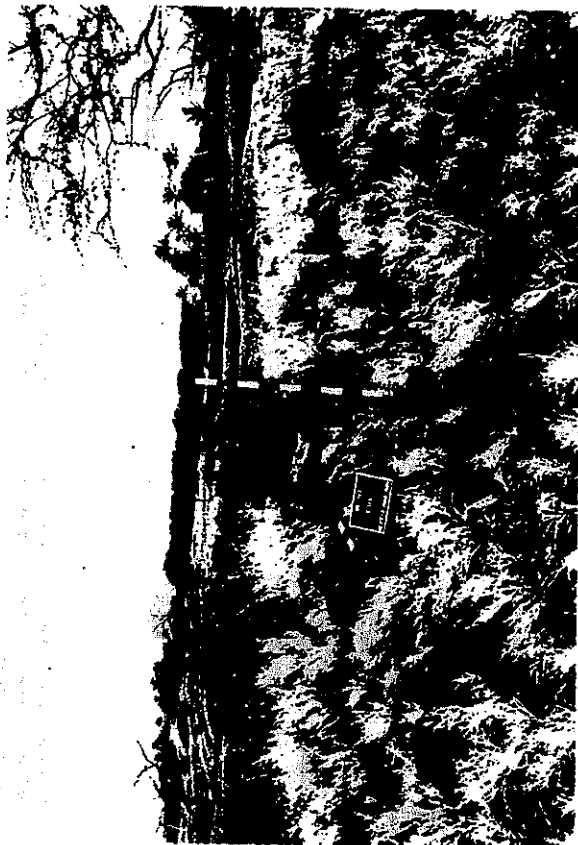


Figure 7. SITE T-113, CAIRN. View to northwest. (PHR  
Neg. 378-1)

it probably functioned as a boundary marker. No trail and no portable remains are visible in this area. Site T-114 was initially recorded by Kaschko and Rosendahl (1982), but it was not assigned a formal site number.

#### T-115 Cairn

This cairn measures c. 0.8 by 0.7 m in area and is 0.75 m high. It is roughly cone-shaped and is constructed of crudely stacked subangular basalt boulders, but it is not formally faced. The cairn is situated near the Ouli and Lalémilo ahupua'a boundary; it is in fair condition and probably functioned as a boundary marker. No trail and no portable remains are visible in this area. Site T-115 was initially recorded by Kaschko and Rosendahl (1982), but it was not assigned a formal site number.

#### T-116 Cairn

This cairn measures c. 0.7 by 0.45 m in area and is 0.5 m high. It is roughly cone-shaped and is constructed of crudely stacked subangular basalt boulders, but it is not formally faced. The cairn is in fair condition and is situated on a ridge crest; its function is undetermined. No trail and no portable remains are visible in this area.

#### T-117 Boulder Alignment

This boulder alignment measures c. 1.1 m long by 0.4 m wide and is 0.75 m high. It is in poor condition and is constructed of stacked, subangular basalt boulders, two to three courses high. No portable remains or cultural deposits are visible in this area. The boulder alignment is situated on a low rise, and its function is undetermined.

#### T-118 Cairn

This cairn measures c. 0.8 by 0.65 m in area and is 0.5 m high. It is roughly oval or circular in plan view and is constructed of stacked subangular basalt boulders, three to four courses high; it is crudely faced. The cairn is in fair condition, but its function is undetermined. No trail and no portable remains are visible in this area.

#### T-119 Wall Segment

This wall segment measures c. 5.5 m long by 0.65 m wide and is 0.4 to 0.5 m high (Figure 8). It is situated on the south slope of a rise, and its long axis is oriented downslope. The wall is in poor condition; it is constructed of piled subangular basalt boulders, and it utilizes a natural bedrock terrace. The bedrock terrace, c. 2.7 m long by 1.2 m high, is oriented perpendicular (west) to the wall and creates a sheltered area.

No portable remains or cultural deposits are visible in this area, but Site T-119 probably functioned as a temporary shelter.

#### T-120 Enclosure

This enclosure, situated on a rise overlooking the coast, measures c. 7.6 by 5.0 m overall and has a level soil interior, c. 2.8 by 2.5 m in area (Figure 9). The enclosure is in fair condition and is constructed of stacked subangular basalt boulders, but it does not contain an entrance or opening. The exterior sides of the enclosure are sloping or even with the surrounding ground surface and measure c. 0.15 to 0.5 m high. In contrast, the interior sides are raised, measuring c. 0.5 to 0.7 m high, and the south side appears formally faced. Originally, the structure may have been a C-shaped shelter, open to the west, which was eventually altered for military training activities with the addition of the west wall. Portable remains recorded on the interior and exterior soil surfaces of the structure include *N. pices*, *Cypraea* spp., and *Periplypta reticulata*. Subsequently, PHRI excavated two test units in Site T-120; one in the interior soil surface and one partly through the south wall.

#### T-121 Historic Refuge

This site contains a surface scatter of historic refuse measuring c. 3.0 by 2.0 m in area. The refuse is probably associated with recent historic structures (Sites T-101 through -103); it is partly buried or altered by bulldozing activity. The portable remains all appear recent and include glass, ceramic, metal items, bottles, plates, spoons, batteries, aluminum, and marine shell (*Cellana* spp., *N. pices*). Laboratory inspection of surface collected portable remains confirmed all items were of recent historic origin.

#### T-122 Historic Structure

This historic structure consists of an animal pen and a platform (Figure 10). The pen measures c. 6.4 by 4.6 m in area and has walls 0.9 to 1.0 m high, and the platform measures c. 4.0 by 2.5 m in area. They are constructed with wooden planks, beams, and corrugated iron roofing, utilizing *kiawe* trees for support. These structures appear to be of recent historic construction and occupation, but they are abandoned.

#### 50-10-11-5629 Kaunaoa Point Complex

This complex is located on Kaunaoa Point and consists of nine features, of which three (Features F, H, and I) are situated within the present project area. Feature F, a platform/enclosure (Figure 11), measures c. 11.5 by 7.1 m in area and has walls that are 1.0 to 2.3 m wide and 0.4 to 0.5 m high. The platform portion, a raised stone and earthen fill structure, comprises the southern two thirds of the feature.

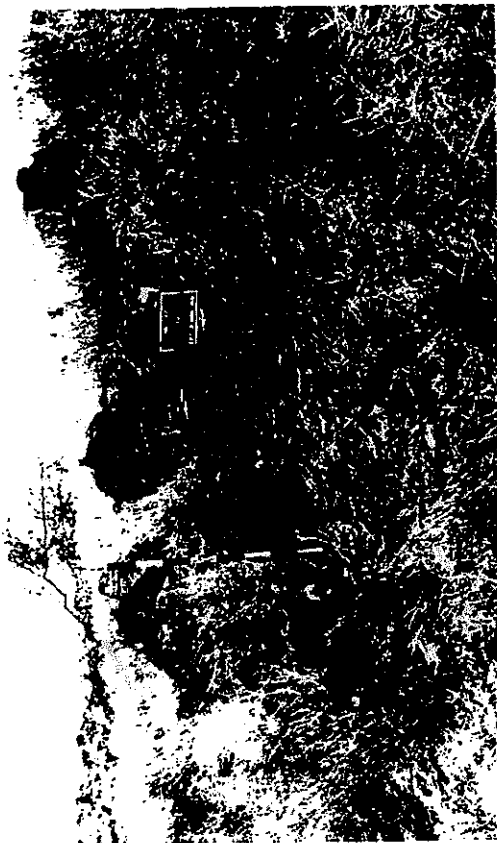


Figure 8. SITE T-119, HALL SEGMENT. View to west. (PHRI Neg. 378-7)

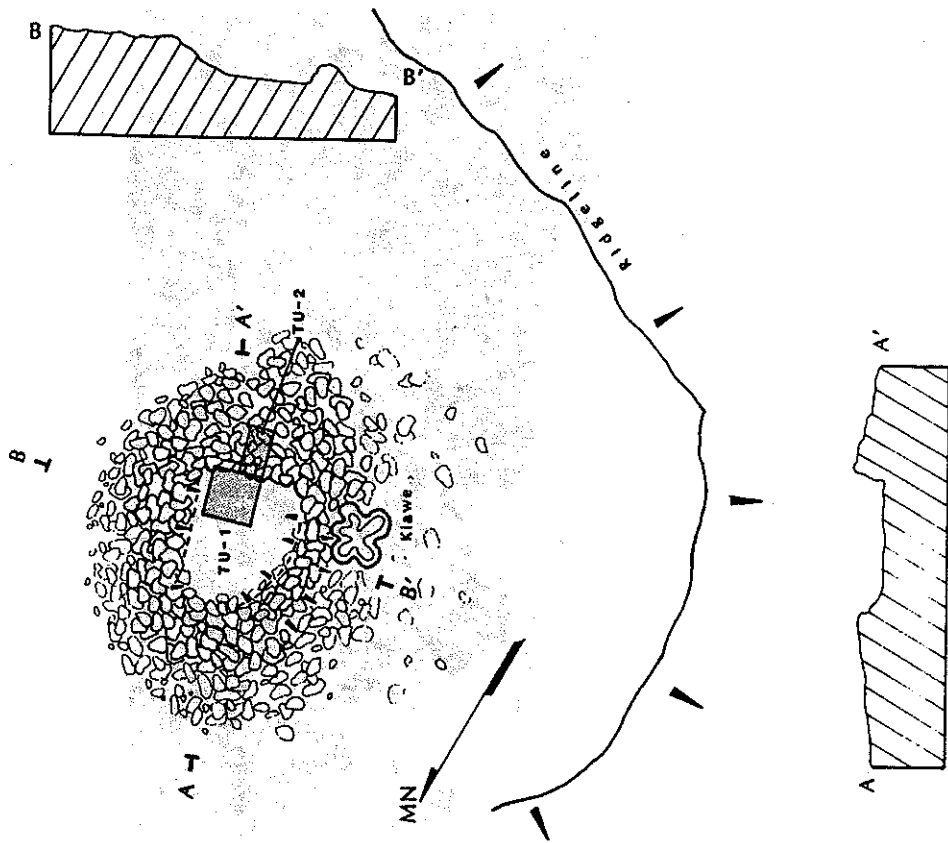


Figure 9  
Site T-120



Figure 10, SITE T-122, HISTORIC STRUCTURE. View to northeast. (PHRI Neg.378-21)

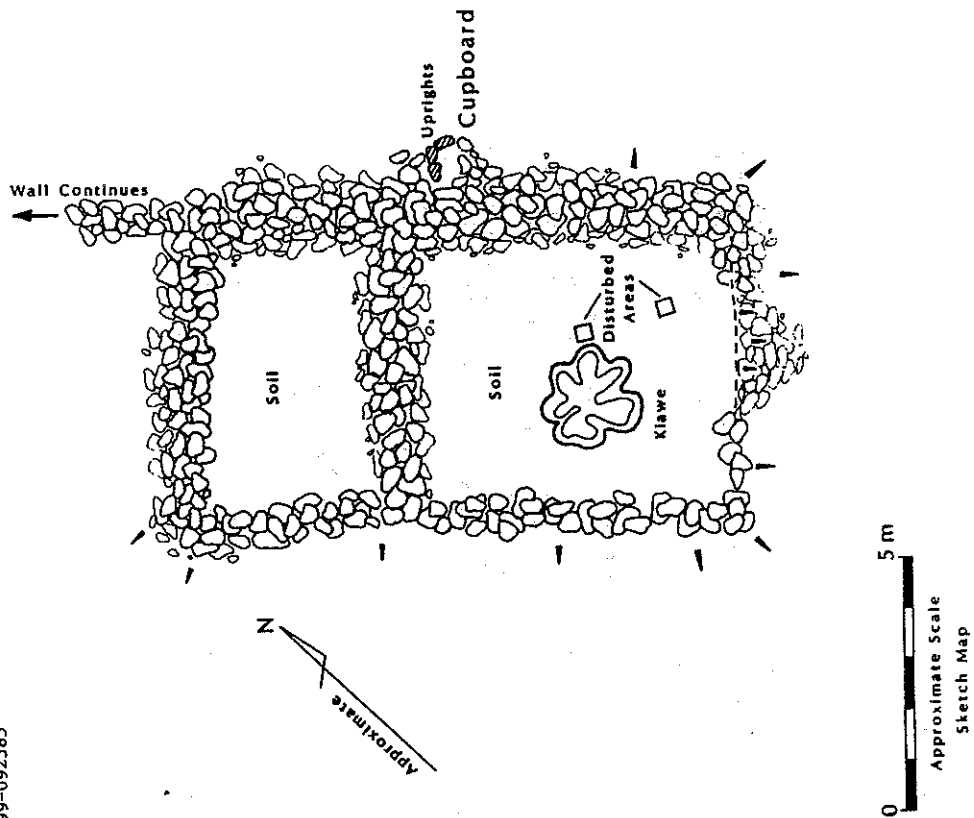


Figure 11  
Site 5629  
Feature F

The perimeter wall is generally sloping or rounded in profile and is constructed of crudely stacked subangular basalt boulders and cobbles, with several waterworn basalt boulders. A possible cupboard is visible within the east wall; the cupboard measures c. 0.9 by 0.4 m in area and 0.4 m deep and is constructed with several upright boulders. The level soil surface of the platform contains a kiawe tree, a scatter of marine shell midden and two, unrecorded test excavations. The enclosure portion comprises the northern one-third of Feature F and consists of a crudely stacked boulder wall enclosing a level soil area. The level soil area of the enclosure is c. 0.25 m below the Feature F platform. Portable remains recorded on the soil surface of Feature F include *Cypraea* spp., *Echinoidea*, *N. picea*, *Cellana* spp., *Conus* sp., *Thauidae*, *Isognomonidae*, coral, waterworn basalt, and volcanic glass. This structure is probably a habitation feature.

Feature H, an L-shaped terrace, is situated c. 35.0 m southwest of Feature F and measures c. 5.0 by 4.0 m in area; it is 0.25 m high. The terrace is constructed of piled subangular basalt boulders and contains a level soil surface which is slightly raised on the west and south sides. The north side is even with the surrounding ground surface, and the east side is vague or indistinct. An uprooted kiawe near the northeast corner of the terrace revealed marine shell midden and an c. 0.15 m cultural deposit. Portable remains include *Cypraea* spp., *N. picea*, *Echinoidea*, *Isognomonidae*, and coral. This terrace is probably a habitation feature.

Feature I, a surface artifact and midden concentration, is situated adjacent to and southeast of Feature H. It measures c. 12.5 m in diameter and does not appear to contain any structural remnants. Portable remains recorded within Feature I include *Cypraea* spp., *N. picea*, *Conus* sp., *Terebridae*, *Echinoidea* (including *Heterocentrotus mammillatus*), *Isognomonidae*, *Thauidae*, coral, waterworn basalt, and volcanic glass.

Trail 9 (Site 50-10-05-5666)

This coastal-oriented foot trail consists of a worn depression c. 1.0 m wide, without kerbstones or rock alignments. It is visible in the vicinity of Kaunaoa Point Complex (5629) and continues along the coast toward Kaunaoa Bay. This trail appears to follow a route similar to that of the Kawaihae-Puako Trail, a prehistoric/early historic foot trail. Trail 9 was designated Site 50-10-05-5666 by Kaschko and Rosendahl (1982:16).

Road 10

This road consists of a gravel and asphalt surface, and it is currently used by South Kohala Resort as a service road. It has been identified as the historic Kawaihae-Puako Road which was originally constructed and/or maintained by Hawaii County (Kaschko and Rosendahl 1982:19).

## EXCAVATIONS

Based upon recommendations made by Rosendahl (1985a:3), intensive survey recording and test excavations were carried out at Sites T-104 (Feature A) and T-120 within the South Kohala Resort project area; in addition, four reconnaissance auger cores were made in beach deposits along the base of the steep bedrock bluff at the back (inland) of the north end of Hapuna Beach. Findings of the test excavations are summarized in Table 2.

The total excavated area was c. 2.5 sq m. This total consisted of two hand-excavated test units totaling 1.0 sq m, excavated at Site T-104 (Feature A) (Figure 4); and one hand-excavated test unit (1.0 sq m) and one shovel-excavated test unit (0.5 sq m), excavated at Site T-120 (Figure 9). Hand-excavated test units were dug according to natural layers, and all fill was processed through 1/8-inch mesh screens to facilitate recovery of portable remains. All midden was field-collected from the 1/8-inch screens, and the recovered materials, including artifacts and soil samples, were retained for laboratory processing and analysis. The shovel test unit was excavated for the purpose of revealing the natural strata and structure association; thus the excavated matrix was only visually inspected and was not screened. All test units were excavated to sterile decomposing bedrock.

Reconnaissance testing along the base of the steep bedrock bluff at the back (inland) of the north end of Hapuna Beach consisted of four auger cores, each c. 10 cm in diameter (Figure 2, at end). All auger-excavated fill was carefully inspected upon removal for the presence of relevant cultural material, but it was not screened. Soil samples from auger cores were also retained for subsequent laboratory processing and analyses. All detailed soil sample descriptions were done using standard procedures and terminology as set forth in the Soil Survey Manual (Soil Survey Staff 1962).

T-104A Double C-shape

A 1.0 by 0.5 m test unit (TU-1) was excavated within the interior soil area of the north "room" and was partially extended into the shelter wall. The excavation revealed the following detailed stratigraphy below the dismantled wall (Figure 12):

| LAYER | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I     | c. 3-5 cm thick; dark brown (7.5YR 3/4 dry) silt loam; structureless, very fine, granular structure; loose, very friable, nonsticky and slightly plastic; abrupt and smooth boundary. Contains sparse amounts of <i>Geliana</i> spp., <i>N. Picea</i> , <i>Colobocentrotus atratus</i> , <i>H. mammillatus</i> , unidentified seeds, and charcoal fragments. No artifacts. |

Table 2.

SUMMARY OF TEST EXCAVATIONS  
SOUTHERNMOST PORTION OF SOUTH KOHALA RESORT

| Site & Feature No. | Formal Site Type | Unit Designation | Excavated Area (sq m) | Comments                                                                                                                                       |
|--------------------|------------------|------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| T-104A             | Double C-shape   | TU-1             | 0.5                   | Several natural layers and sparse marine shell midden present; no artifacts                                                                    |
|                    |                  | TU-2             | 0.5                   | Several natural layers and sparse marine shell midden present; one volcanic glass flake recovered                                              |
| T-120              | Enclosure        | TU-1             | 1.0                   | Several natural layers and moderate marine shell midden present; volcanic glass flakes suitable for hydration-rind age determination recovered |
|                    | Beach deposit    | Core 1           | 10 cm diameter        | Shovel excavated stratigraphy unit; matrix not screened                                                                                        |
|                    | Beach deposit    | Core 2           | 10 cm diameter        | Excavated to 190 cm below surface; no cultural deposit                                                                                         |
|                    | Beach deposit    | Core 3           | 10 cm diameter        | Excavated to 180 cm below surface; no cultural deposit                                                                                         |
|                    | Beach deposit    | Core 4           | 10 cm diameter        | Excavated to 100 cm below surface; no cultural deposit                                                                                         |
|                    | Beach deposit    | Core 4           | 10 cm diameter        | Excavated to 290 cm below surface; no cultural deposit                                                                                         |

DESCRIPTION

c. 1-5 cm thick; dark brown (7.5YR 3/4 dry) silt loam; structureless, very fine, granular structure; loose, very friable, nonsticky and slightly plastic; abrupt and smooth boundary. Contains *Cellana* spp., *N. picea*, *Cypraea* spp., *D. ricina*, *Isognomonidae*, *Echinoidea*, and unidentified seeds. No artifacts.

c. 13-28 cm thick; dark brown (7.5YR 3/4 dry) silt loam; weak, very fine, granular structure; loose to soft, very friable, nonsticky and slightly plastic. Contains *Cellana* spp., *N. picea*, *Strombidae*, *Cypraea* spp., *D. ricina*, *Isognomonidae*, *Echinoidea* (including *C. atratus*) and unidentified seeds. Artifacts include one volcanic glass flake.

The test unit was excavated to a maximum depth of c. 29 cm below surface.

The test excavations (TU-1, -2) revealed several soil layers representative of activity at Site T-104 (Feature A). Layer I represents recent deposition of decaying humus material and loose soil that comprises the surface organic layer. Layer II and the charcoal-stained soil lens (in TU-1) represent an apparently prehistoric cultural component that contained the structure foundation rocks (TU-1), a single volcanic glass flake artifact (TU-2), and sparse marine shell midden. The volcanic glass sample (PHRI No. VG-282) was collected and was submitted to MOHAB for hydration-rind dating. The results indicated a calendar date range of AD 1550-1570. Although charcoal flecking and a charcoal-stained soil lens were present in TU-1, the amount was not sufficient for a radiocarbon sample. The presence of charcoal-stained soil apparently below the shelter wall (TU-1) suggests cultural activity predated shelter construction. Excavation of TU-1 and TU-2 was terminated at sterile, decomposing bedrock.

T-120 Enclosure

A 1.0 by 1.0 m test unit (TU-1) was excavated in the interior soil area of the enclosure, adjacent to the south wall. Excavation of TU-1 revealed the following detailed stratigraphy:

DESCRIPTION

c. 1-3 cm thick; dark brown (7.5YR 3/4 dry) silt loam; structureless, very fine, granular structure; loose, very friable, slightly sticky and slightly plastic; abrupt and smooth boundary. Contains *Cellana* spp., *N. picea*, *L. pinctada*, *Strombidae*, *Hipponitidae*, *Cypraea* spp., *Thalididae*

LAYER

I

South Face

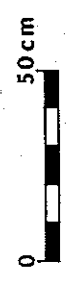
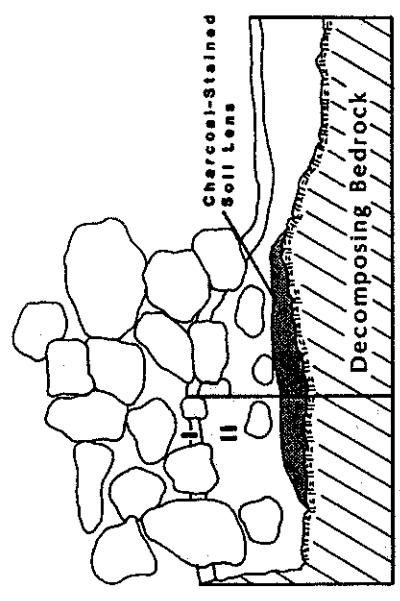


Figure 12  
Site T-104  
Feature A, TU-1  
Section

c. 4-25 cm thick; brown to dark brown (7.5YR 4/4 dry) silt loam; weak, very fine, granular structure; loose, very friable, nonsticky and slightly plastic; abrupt and smooth boundary. Contains sparse amounts of *N. picea*, *Strombidae*, *Cypraea* spp., *Drupa ricina*, *Echinoidea* (including *C. atratus*), fish bone, unidentified seeds, waterworn coral and charcoal fragments. No artifacts.

c. 3-7 cm thick; very dark brown (10YR 2/2 dry) silt loam; weak, very fine granular structure; loose, very friable, nonsticky and slightly plastic. Contains *Littorina pinctada*, unidentified seeds, waterworn coral and charcoal flecks. No artifacts.

The test unit was excavated to a maximum depth of c. 31 cm below surface.

A second test unit (TU-2) measuring 1.0 by 0.5 m was excavated within the interior soil area of the south "room." The excavation of TU-2 revealed the following detailed stratigraphy:

(including D. ricina, Purpura sperts), Conus sp., Isochnomonidae, Echinoidea (including C. atratus, H. mammillatus), fish bone (including Scaridae), mammal bone, charcoal fragments, unidentified seeds, land snails, and coral. Artifacts include volcanic glass and an echinoid abrader.

## II

c. 9-15 cm thick; very dark brown (10YR 2/2 dry) silt loam; weak, very fine granular structure; loose to soft, very friable, slightly sticky and slightly plastic; abrupt and wavy boundary. Contains Callana spp., N. picea, L. pintado, Strombidae, Cypraea spp., Thaididae (including Drupa morum), Conus sp., Isochnomonidae, Tellina palatum, Echinoidea (including H. mammillatus), Crustacea, fish bone (including Labridae and Scaridae), mammal bone, charcoal fragments, kukui (Aleurites moluccana), and coral. Artifacts include volcanic glass, a basalt flake and core, perforated shell (Conus sp.), an echinoid abrader, and modified pearl shell.

## III

c. 1-6 cm thick; dark brown (10YR 3/3 dry) silt loam; moderate, very fine to fine, granular structure; loose to soft, very friable, slightly sticky and slightly plastic. Contains Callana spp., N. picea, Cypraea spp., Thaididae, fish bone (including Scaridae) and Echinoidea. No artifacts.

The test unit was excavated to a maximum depth of c. 18 cm below surface.

A second test unit (TU-2), a shovel-excavated stratigraphy unit measuring 1.0 by 0.5 m, was excavated perpendicular to TU-1 and was extended south through the enclosure wall. Excavation of TU-2 revealed the following detailed stratigraphy below c. 40 cm of dismantled rocks comprising the enclosure wall (Figure 13):

## LAYER

## DESCRIPTION

I  
c. 1-3 cm thick; dark brown (7.5YR 3/4 dry) loam; structureless, very fine, granular structure; loose to soft, loose to very friable, nonsticky and nonplastic; abrupt and smooth boundary

II  
c. 10-18 cm thick; brown to dark brown (7.5YR 4/4 dry) silt loam; weak, very fine, granular structure; loose, loose, nonsticky and slightly plastic; abrupt and wavy boundary

III  
c. 10-12 cm thick; dark yellowish-brown (10YR 3/4 dry) silt loam; moderate, very fine to fine, granular structure; loose, loose, nonsticky and slightly plastic

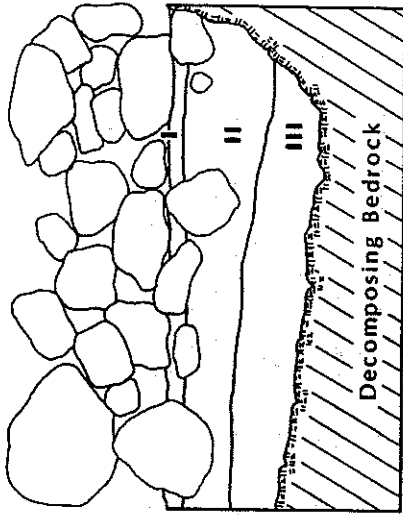


Figure 13

### TU-2, Northeast Face Section

The test unit was excavated to a maximum depth of c. 31 cm below surface. TU-2 contained marine shell midden, but no cultural remains were recovered, due to the excavation procedure.

The test excavations (TU-1, -2) revealed several soil layers representative of activity at Site T-120. Layer I represents recent deposition of decaying humus material and loose soil that comprises the surface organic layer. Layer II contains an apparently prehistoric cultural component that includes the structure foundation rocks, moderate to sparse amounts of marine shell midden, and artifacts. Layer III contains decomposing bedrock and represents the original ground surface predating site occupation. It contains material that probably resulted from initial site occupation or from intrusion of subsequently deposited materials. Excavation of TU-1 and TU-2 was terminated on the surface of sterile, decomposing bedrock.

Artifacts from TU-1 include flaked stone (basalt and volcanic glass), a perforated Conus sp. shell, a modified pearl shell, and an echinoid spine (H. mammillatus) abrader. A volcanic glass sample (PNU No. VC-283) was collected from TU-1 and was submitted to MCHLAB for hydration-rind



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III c. 125 cm thick; very pale brown (10YR 7/3 dry) sand; structureless, very fine, single grain structure; loose, loose, nonsticky and nonplastic; clear and smooth boundary

IV c. 55 cm thick; grey (10YR 5/1 dry) gravel and gravelly; structureless, fine to coarse, single grain structure; loose, loose, nonsticky and nonplastic

Beach Deposit Core 3

Auger Core 3 measured c. 10 cm in diameter and was excavated in a sand beach deposit at the base of a vertical bedrock bluff. The excavation revealed the following detailed stratigraphy:

| <u>LAYER</u> | <u>DESCRIPTION</u> |
|--------------|--------------------|
|--------------|--------------------|

|   |                                                                                                                                                                                                 |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I | c. 30 cm thick; dark yellowish-brown (10YR 3/4 dry) loamy sand; structureless, very fine, single grain structure; soft, very friable, slightly sticky and nonplastic; clear and smooth boundary |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    |                                                                                                                                                                                                 |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| II | c. 40 cm thick; light yellowish-brown (10YR 6/4 dry), very fine sand; structureless, very fine, single grain structure; soft, very friable, nonsticky and nonplastic; clear and smooth boundary |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|     |                                                                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| III | c. 30 cm thick; very dark brown (10YR 2/2 dry), very fine sandy loam; moderate, medium, crumb structure; slightly hard, firm, slightly sticky and slightly plastic |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Beach Deposit Core 4

Auger Core 4 measured c. 10 cm in diameter and was excavated in a sand beach deposit at the base of a steep rise. The excavation revealed the following detailed stratigraphy:

| <u>LAYER</u> | <u>DESCRIPTION</u> |
|--------------|--------------------|
|--------------|--------------------|

|   |                                                                                                                                                                                            |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I | c. 40 cm thick; dark yellowish-brown (10YR 4/4 dry), very fine sandy loam; weak, very fine, crumb structure; loose, loose, slightly sticky and slightly plastic; clear and smooth boundary |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    |                                                                                                                                                                 |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| II | c. 250 cm thick; light yellowish brown (10YR 6/4 dry), very fine sand; structureless, very fine, single grain structure; loose, loose, nonsticky and nonplastic |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

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dating. The results indicated a calendar date range of AD 1602-1638. A second volcanic glass sample (PHI No. VG-284) indicated a calendar date range of AD 1662-1672. Although charcoal flecking is present in TU-1, the amount was not sufficient for a radiocarbon sample.

Beach Deposit Core 1

Auger Core 1 measured c. 10 cm in diameter and was excavated in a sand beach deposit at the base of a steep rise. The excavation revealed the following detailed stratigraphy:

| <u>LAYER</u> | <u>DESCRIPTION</u> |
|--------------|--------------------|
|--------------|--------------------|

|   |                                                                                                                                                                |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I | c. 35 cm thick; brown (10YR 5/3 dry) sand; structureless, very fine, single grain structure; loose, loose, nonsticky and nonplastic; clear and smooth boundary |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    |                                                                                                                                                                                            |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| II | c. 35 cm thick; brown to dark brown (7.5YR 4/4 dry) sandy loam; weak, fine to medium, crumb structure; soft, very friable, slightly sticky and slightly plastic; clear and smooth boundary |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|     |                                                                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| III | c. 10 cm thick; dark yellowish-brown (10YR 4/4 dry) loamy sand; structureless, very fine, single grain structure; loose, loose, nonsticky and nonplastic; clear and smooth boundary |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    |                                                                                                                                                |
|----|------------------------------------------------------------------------------------------------------------------------------------------------|
| IV | c. 10 cm thick; dark brown (10YR 3/3 dry) loamy sand; structureless, very fine, single grain structure; loose, loose, nonsticky and nonplastic |
|----|------------------------------------------------------------------------------------------------------------------------------------------------|

Beach Deposit Core 2

Auger Core 2 measured c. 10 cm in diameter and was excavated in a sand beach deposit at the base of a vertical bedrock bluff. The excavation revealed the following detailed stratigraphy:

| <u>LAYER</u> | <u>DESCRIPTION</u> |
|--------------|--------------------|
|--------------|--------------------|

|   |                                                                                                                                                                                                                           |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I | c. 10 cm thick; brown (10YR 5/3 dry) loamy sand; structureless to moderate, very fine to fine, single grain to crumb structure; loose to soft, loose to very friable, nonsticky and nonplastic; clear and smooth boundary |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|    |                                                                                                                                                                                            |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| II | c. 10 cm thick; dark yellowish-brown (10YR 3/4 dry) sandy loam; moderate, medium, crumb structure; slightly hard, friable, slightly sticky and slightly plastic; clear and smooth boundary |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The four subsurface reconnaissance auger core tests revealed several natural layers that probably resulted from aeolian and/or alluvial forces, but no cultural remains or deposit are present. All auger cores were terminated on solid, impenetrable bedrock surfaces.

## DATA ANALYSES

## AGE DETERMINATIONS

Due to the paucity of charcoal, no carbon samples suitable for radio-carbon dating were submitted for analysis. However, three volcanic glass samples suitable for hydration-rind analysis were submitted to MOHLAB. Prior to submission, volcanic glass specimens were sorted and analyzed by PHRI Laboratory Technician Rodney T. Fujii, under the direct supervision of Dr. Joseph B. Halbig, professor of geology at the University of Hawaii at Hilo. Samples submitted for hydration-rind analysis represent trachytic glass and probably originated (source) from Puuwaawa cinder cone, North Kona, Hawaii Island. Results of the volcanic glass hydration-rind age determinations are presented in Table 3.

Examination of the volcanic glass dating results indicates three distinct date ranges spanning the period AD 1550-1672. The volcanic glass date ranges appear to indicate a late prehistoric (16th-17th century) date for site occupation; however, due to the limited sample and to the absence of additional absolute dates (radiocarbon), this interpretation must be considered tentative.

Table 3.

## SUMMARY OF VOLCANIC GLASS HYDRATION-RIND AGE DETERMINATIONS

| PHRI<br>Lab. No.<br>VG- | MOHLAB<br>Lab. No.<br>318- | PHRI<br>Site<br>No. | Provenience                           | Hydration<br>Rind<br>(microns) | *Calendric<br>Date Yrs.<br>AD | Calendric<br>Range Yrs.<br>AD |
|-------------------------|----------------------------|---------------------|---------------------------------------|--------------------------------|-------------------------------|-------------------------------|
| 282                     | T-104A-1                   | T-104<br>(Fea. A)   | TU-2, Layer II<br>55/69-68/97<br>cmbd | 4.68±0.08                      | 1560±10                       | 1550-1570                     |
| 283                     | T-120-2                    | T-120               | TU-1, Layer I<br>27/36-30/37<br>cmbd  | 4.33±0.10                      | 1620±18                       | 1602-1638                     |
| 284                     | T-120-7a                   | T-120               | TU-1, Layer II<br>30/37-41/46<br>cmbd | 4.04±0.03                      | 1667±5                        | 1662-1672                     |

\*Hydration rate based upon experimentally derived hydration constants for Puuwaawa trachytic glass (MOHLAB Technical Report No. 11 [Michels, 1982]), recently revised utilizing an effective hydration temperature computed from air temperature data for Kona Airport, Hawaii Island. The rate is 51.50 microns/1,000 years (Michels, 1985).

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## MIDDEN REMAINS

Midden recovered from Site T-104, Feature A (TU-1, -2), and from Site T-120 (TU-1) was retained for laboratory analysis. (Field methods used for recovery of these remains have already been summarized under Excavations.) Midden recovered from Site T-104 (Feature A) was processed on a qualitative basis, while that from Site T-120 was processed quantitatively.

Material recovered from Site T-120 (TU-1) was processed in the laboratory through 1/4- and 1/8-inch screens. All material retained in the 1/4-inch screen, plus a 100 g sample of material in the 1/8-inch screen, was completely sorted. Subsequent comparison of 1/4- and 1/8-inch midden weights did not reveal substantial differences in species frequency; therefore, the weights were combined for analysis purposes. Material recovered from Site T-104 (Feature A) was simply recorded on a presence/absence basis. Kay (1979), Tinker (1978), Goshine and Brock (1965), and Edmondson (1946) were used as references for mollusc, echinoderm, and fish identifications. Diagnostic fish remains were analyzed and identified by FRI Laboratory Technician Deborah Hay. The variety and distribution of midden remains recovered during test excavations at Sites T-104 (Feature A) and T-120 are summarized in Table 5.

A cursory analysis of quantitative midden remains recovered from Site T-120 (TU-1) indicates Cypraeidae to be the predominant marine shell, followed by *Callana* spp., *N. pices* and Thaididae. Examination of midden weights by layer indicates a significantly greater weight for Layer II deposits--an increase of 77.4% over Layer III deposits and a 69.9% increase over Layer I. The variety and quantity of marine shell suggest intensive exploitation of the marine littoral zone. However, the presence of kuku (*Aleurites moluccana*), probably transported from an inland area, indicates some degree of terrestrial exploitation.

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## PORTABLE ARTIFACTS

Sixteen indigenous portable artifacts were recovered during test excavations conducted at Sites T-104 (Feature A) and T-120. Recent historic artifacts (metal) were also present at Site T-120, but they were not collected. The indigenous artifacts include fishing gear (N=1), flaked stone (N=1), personal adornment (N=1), tools (N=2), and modified shell (N=1), comprised of lithic, bone, and marine shell material (Table 4). The recovered artifacts do not appear to represent unusual or early Hawaiian type artifacts. A cursory inspection of artifact distribution by depth indicates Layer II contained the greatest number, accounting for 12 (75%) of the total assemblage recovered. Due to the paucity of recovered artifacts, no further analysis was attempted.

Table 4.

## DISTRIBUTION OF INDIGENOUS PORTABLE ARTIFACTS

| Category           | T-104A   |          | T-120     |          | Surface  | Total     |
|--------------------|----------|----------|-----------|----------|----------|-----------|
|                    | TU-2     | II       | TU-1      | I        |          |           |
| INDIGENOUS         |          |          |           |          |          |           |
| Fishing gear       |          |          |           |          |          |           |
| Tab (pearl shell)  | -        | -        | -         | -        | 1        | 1         |
| Flaked stone       |          |          |           |          |          |           |
| Flakes/Cores       |          |          |           |          |          |           |
| Basalt             | -        | 1        | 1         | 2        | -        | 3         |
| Volcanic glass     | 1        | 1        | 1         | 6        | -        | 8         |
| Personal adornment |          |          |           |          |          |           |
| Ornament (shell)   | -        | -        | -         | 1        | -        | 1         |
| Tools              |          |          |           |          |          |           |
| Abrader (echinoid) | -        | 1        | 1         | 1        | -        | 2         |
| Misc./Other        |          |          |           |          |          |           |
| Modified:          |          |          |           |          |          |           |
| Pearl shell        | -        | -        | -         | 1        | -        | 1         |
| <b>TOTAL</b>       | <b>1</b> | <b>3</b> | <b>11</b> | <b>1</b> | <b>1</b> | <b>16</b> |

Table 5.  
QUANTITATIVE AND QUALITATIVE SUMMARY  
OF HIDDEN REMAINS FOR SITES T-120 AND T-104A

| CATEGORY                          | QUANTITATIVE |               |              | QUALITATIVE |          |          |          | TOTAL    |               |
|-----------------------------------|--------------|---------------|--------------|-------------|----------|----------|----------|----------|---------------|
|                                   | T-120        |               | TU-1         | T-104A      |          | TU-2     |          |          |               |
|                                   | I            | II            |              | I           | II       | I        | II       |          |               |
| <b>MARINE INVERTEBRATES</b>       |              |               |              |             |          |          |          |          |               |
| <b>GASTROPODA</b>                 |              |               |              |             |          |          |          |          |               |
| <i>Callina</i> spp.               | 3.79         | 39.24         | 8.06         | -           | -        | -        | +        | +        | 51.09         |
| <i>Nerita</i> picea               | 4.89         | 36.09         | 2.91         | +           | -        | -        | +        | +        | 43.89         |
| <i>Littorina</i> pintado          | 0.93         | 2.29          | -            | -           | +        | -        | -        | -        | 3.22          |
| <i>Strombidae</i>                 | 1.90         | 3.01          | -            | -           | +        | -        | +        | +        | 4.91          |
| <i>Cypraeidae</i>                 | 52.84        | 354.14        | 19.44        | -           | -        | -        | +        | +        | 426.42        |
| <i>Hipponicidae</i>               | 0.47         | -             | -            | -           | -        | -        | -        | -        | 0.47          |
| <i>Thaididae</i>                  | 1.39         | 9.25          | 0.01         | -           | -        | -        | -        | -        | 10.65         |
| <i>Drupa</i> morum                | -            | 13.96         | -            | -           | -        | -        | -        | -        | 13.96         |
| <i>Drupa</i> ricina               | 0.79         | 12.84         | -            | +           | -        | -        | +        | +        | 13.63         |
| <i>Morula</i> granulata           | -            | 0.55          | -            | -           | -        | -        | -        | -        | 0.55          |
| <i>Purpura</i> sperta             | 0.33         | 3.88          | -            | -           | -        | -        | -        | -        | 4.41          |
| <i>Conidae</i>                    | 0.43         | 4.46          | -            | -           | -        | -        | -        | -        | 4.89          |
| <i>Operculia</i>                  | 0.05         | 0.21          | 0.01         | -           | -        | -        | -        | -        | 0.27          |
| Unident. gastropods               | -            | 0.46          | -            | +           | -        | -        | -        | -        | 0.46          |
| <b>SUBTOTAL GASTROPODA</b>        | <b>68.01</b> | <b>479.92</b> | <b>30.89</b> | <b>+</b>    | <b>+</b> | <b>+</b> | <b>+</b> | <b>+</b> | <b>578.82</b> |
| <b>BIVALVIA</b>                   |              |               |              |             |          |          |          |          |               |
| <i>Isognomonidae</i>              | -            | -             | -            | -           | -        | -        | +        | +        | +             |
| <i>Isognomon</i> Californicum     | 3.32         | 18.58         | -            | -           | -        | -        | -        | -        | 21.90         |
| <i>Tellina</i> Palatum            | -            | 0.24          | -            | -           | -        | -        | -        | -        | 0.24          |
| <b>SUBTOTAL BIVALVIA</b>          | <b>3.32</b>  | <b>18.82</b>  | <b>-</b>     | <b>-</b>    | <b>-</b> | <b>-</b> | <b>+</b> | <b>+</b> | <b>22.14</b>  |
| <b>OTHER</b>                      |              |               |              |             |          |          |          |          |               |
| Echinoidae                        | 4.62         | 75.71         | 4.23         | +           | -        | -        | +        | +        | 94.56         |
| Non-marine gastropods             | 0.95         | -             | -            | -           | -        | -        | -        | -        | 0.95          |
| <b>SUBTOTAL OTHER</b>             | <b>15.57</b> | <b>75.71</b>  | <b>4.23</b>  | <b>+</b>    | <b>-</b> | <b>-</b> | <b>+</b> | <b>+</b> | <b>95.51</b>  |
| <b>TOTAL MARINE INVERTEBRATES</b> | <b>86.90</b> | <b>574.45</b> | <b>35.12</b> | <b>+</b>    | <b>+</b> | <b>+</b> | <b>+</b> | <b>+</b> | <b>696.47</b> |
| <b>VERTEBRATES</b>                |              |               |              |             |          |          |          |          |               |
| <b>FISH</b>                       |              |               |              |             |          |          |          |          |               |
| Labridae (Wrasses)                | -            | 1.05          | -            | -           | -        | -        | -        | -        | +             |
| Scaridae (Parrot fish)            | 0.10         | 0.39          | 0.20         | -           | -        | -        | -        | -        | 1.05          |
| Unidentified                      | 0.22         | 4.46          | 0.24         | -           | -        | -        | -        | -        | 0.69          |
| MAMMAL                            | 0.15         | -             | -            | -           | -        | -        | -        | -        | 4.92          |
| <b>TOTAL VERTEBRATES</b>          | <b>0.47</b>  | <b>5.90</b>   | <b>0.44</b>  | <b>-</b>    | <b>-</b> | <b>-</b> | <b>-</b> | <b>-</b> | <b>6.81</b>   |
| <b>TOTAL VEGETAL</b>              | <b>1.78</b>  | <b>3.20</b>   | <b>-</b>     | <b>+</b>    | <b>+</b> | <b>+</b> | <b>+</b> | <b>+</b> | <b>4.98</b>   |

CONCLUSION

DISCUSSION

Archaeological reconnaissance, intensive survey, and testing in the southernmost portion of South Kohala Resort project area confirmed the presence of archaeological sites and features of prehistoric as well as historic-period occupation and exploitation. The range of functional feature types identified includes temporary and permanent habitation features, a foot trail, a historic road, boundary features (cairns), and recent historic recreational features. The overall physical condition and integrity of archaeological remains varies from poor to good, with several structural features being in quite good condition.

Excavations at Sites T-104 (Feature A) and T-120, both of which had moderate excavation potential, revealed the presence of midden and artifactual remains. The midden remains consisted primarily of various marine shell species; in contrast, the artifactual remains were limited in number and type. Dating of recovered volcanic glass specimens indicated a calendar date range of AD 1550-1672, which generally corresponds with the lower end of volcanic glass date ranges reported by Kaschko and Rosendahl (1983:82) for coastal sites in the Land of Oahu.

The distribution of sites within the present project area conforms to the general pattern of aboriginal Hawaiian settlement reconstructed on the basis of archaeological, ethnohistoric, and ethnographic sources for the dry, leeward environmental setting of South Kohala (Rosendahl 1972). This local environmental setting is characterized by three major zones: "a narrow coastal zone of sand and boulder beaches and strand vegetation; an arid intermediate or transition zone of shallow volcanic soils, restricted xerophytic vegetation, and eroded topography and; a fertile upland zone in which agriculture was conducted" (Rosendahl 1972:83). Sites and features identified within the southernmost portion of the South Kohala Resort project area evidence occupation of the narrow coastal zone. This occupation can be summarized as follows:

Coastal Occupation--scattered residential settlements along the shore; people engaged principally in marine exploitation--fishing, strand gathering of shellfish and seaweed, and production of salt; marginal agricultural activity, principally sweet potatoe cultivation and possibly some taro, in sandy coastal soils, along the courses of seasonally flowing streams, and on the relatively fertile alluvial soil deposits that fanned out from the mouths of such intermittent streams in the inland area between Kawaihae and Pauoa Bay (Rosendahl 1972:85-86).

Findings of the archaeological reconnaissance, intensive survey, and testing project have provided additional information useful for reconstructing local environmental conditions and resource exploitation patterns of the Oahu coastal zone.

## EVALUATIONS AND RECOMMENDATIONS

The significance of archaeological remains can be defined in terms of potential scientific research, interpretive, and/or cultural values. Research value refers to the potential of archaeological resources for producing information useful in the understanding of culture history, past lifeways, and cultural processes at the local, regional, and interregional levels of organization. Interpretive value refers to the potential of archaeological resources for public education and recreation. Cultural value, within the framework for significance evaluation used here, refers to the potential of archaeological resources for the preservation and promotion of cultural and ethnic identity and values.

To attempt definitive evaluation of the significance of archaeological resources, on the basis of a preliminary assessment such as a reconnaissance survey, is generally premature. Occasionally it is possible, even at a preliminary level of study such as that of a reconnaissance survey, to evaluate the significance of specific sites or features when their scientific research, interpretive, and/or cultural values are obvious. However, in many instances it is necessary first to conduct an intensive survey, often including test excavations, to determine and substantiate the significance of specific archaeological remains.

The basic objective of intensive survey is to collect archaeological data sufficient to determine and document the significance of specific archaeological resources. Intensive survey also permits definition of the nature and scope of any subsequent mitigation that might be necessary or appropriate. For an archaeological resource, the significance of which is based primarily on the scientific research value of information contained within the resource, a program of data recovery--generally extensive research excavations--is often the appropriate form of mitigation. This conclusion is true in instances where preservation--by means of data recovery activities--of significant scientific data contained within a site is more important than continued physical preservation of the site itself.

Upon completion of the field work, survey findings and preliminary conclusions--including tentative evaluations and recommendations--were discussed (September 16, 23, 1985) with Virginia Goldstein (staff planner and historic sites specialist in the Hawaii County Planning Department). Ms. Goldstein concurred with the preliminary conclusions and tentative recommendations presented here regarding further archaeological work to be done within the project area at the South Kohala Resort.

With few specific exceptions, archaeological sites identified within the present South Kohala Resort project area are of minimal significance in terms of research, interpretive, or cultural values (see Table 1, at end). For most of the sites, the reconnaissance survey has accomplished an adequate and appropriate level of data recovery, and no further archaeological work of any kind is believed necessary or justified. Although they are of minimal archaeological significance, a variety of these sites could be considered for preservation and incorporation into the landscape design of any development.

An overall archaeological evaluation of Sites T-104 (Feature A) and T-120 finds them generally to be of moderate significance in terms of scientific research value, but very limited in terms of interpretive and cultural values. The beach deposit along the base of the steep bedrock bluff at the back (inland) of Hapuna Beach is believed to have no scientific research, interpretive, or cultural value.

Based on the intensive survey and test excavations, it is believed that archaeological data recovered from Sites T-104 (Feature A), T-120, and the specified beach deposit area are adequate and sufficient, and that no additional archaeological field work of any kind is necessary or justified. Furthermore, continued physical preservation of Sites T-104 (Feature A) and T-120 is not believed to be essential. This recommendation is based on the following conclusions: (1) Sites T-104 (Feature A) and T-120 contain little subsurface deposit, while the specified beach deposit contains no subsurface deposit; (2) there are few recovered artifacts and midden remains and; (3) Sites T-104 (Feature A) and T-120 have been thoroughly documented.

Previously identified Site 50-10-11-5629 (Kaunaoa Point Complex) has already been determined to have high research and interpretive values, and a program of short-term preservation, research excavations, and interpretive development has previously been recommended (Rosendahl and Kaschko 1983). With regard to Features F, H, and I, which are situated within the present project area, the immediate appropriate course of action recommended would be to conduct intensive survey test excavations; however, such testing could be postponed until further work on the entire site complex is undertaken.

Furthermore, previously identified Trail 9 (Site 5666) (Kaschko and Rosendahl 1982), a coastal foot trail, was believed to have moderate research and cultural values, as well as high interpretive value, in connection with the Kaunaoa Point Complex (Site 5629) and other sites and complexes located along the trail within the Ouli coastal lands. Preservation of the trail has been recommended in light of these values, as well as in the likelihood that preservation of the trail will be required for the purpose of public shoreline access.

The above evaluations and recommendations have been made with the general qualification that archaeological testing is by necessity a sampling procedure, and there is always the possibility, however remote, that previously unidentified subsurface sites or features may be discovered within the project area during development activity. Should such a discovery occur, work in the immediate area of such remains must be suspended and a professional archaeologist notified. Development activity should not resume until the archaeologist has had an opportunity to inspect and evaluate the significance of any newly discovered remains.

**SUMMARY OF GENERAL SIGNIFICANCE ASSESSMENTS  
AND RECOMMENDED GENERAL TREATMENTS**

To facilitate state and county reviews of the evaluations and recommendations presented here, general significance assessments and recommended general treatments for all archaeological sites identified within the southernmost portion of the South Kohala Resort project area are summarized in Table 6. Twenty-three of the 25 identified archaeological sites have been determined to be significant solely for their information content. Sufficient data were collected from 23 of these 25 sites during reconnaissance, intensive survey, and testing, and they no longer contain endangered significant information (Significance Category X); therefore, no further data collection or other mitigative measures can be justifiably recommended for these sites at this time (Recommended Treatment NFW). The 23 sites included in this category are the following:

Road 10, T-101, T-102, T-103, T-104, T-105, T-106, T-107, T-108, T-109, T-110, T-111, T-112, T-113, T-114, T-115, T-116, T-117, T-118, T-119, T-120, T-121, and T-122.

One site (5629) was determined to be significant for its information content and as an excellent example of a site type (Significance Categories A and B). This site is recommended for preservation, with some level of interpretive development (Recommended Treatment PID). As part of any interpretive development, appropriate further data collection (data recovery excavations) has been recommended for the site (Recommended Treatment FDC).

One site (Trail 9) was determined to be significant for its information content, as an excellent example of a site type, and for its cultural value (Significance Categories X, B, and C). This site is recommended for preservation, with some level of interpretive development (Recommended Treatment PID). No further data collection is necessary for this site.

Table 6.

**SUMMARY OF GENERAL SIGNIFICANCE ASSESSMENTS  
AND RECOMMENDED GENERAL TREATMENTS**

| Site or<br>Feature No. | Significance Category |   |     | Recommended Treatment |     |         |
|------------------------|-----------------------|---|-----|-----------------------|-----|---------|
|                        | A                     | X | B C | EDC                   | NFW | PID PAI |
| 5629                   | +                     | - | +   | -                     | +   | -       |
| Subtotal: 1            | 1                     | 0 | 1   | 0                     | 1   | 0       |
| Trail 9                | -                     | + | +   | -                     | -   | +       |
| Subtotal: 1            | 0                     | 1 | 1   | 1                     | 0   | 0       |
| Road 10                | -                     | + | -   | -                     | -   | +       |
| T-101                  | -                     | + | -   | -                     | -   | +       |
| T-102                  | -                     | + | -   | -                     | -   | +       |
| T-103                  | -                     | + | -   | -                     | -   | +       |
| T-104                  | -                     | + | -   | -                     | -   | +       |
| T-105                  | -                     | + | -   | -                     | -   | +       |
| T-106                  | -                     | + | -   | -                     | -   | +       |
| T-107                  | -                     | + | -   | -                     | -   | +       |
| T-108                  | -                     | + | -   | -                     | -   | +       |
| T-109                  | -                     | + | -   | -                     | -   | +       |

**General Significance Categories:**

- A=Important for information content, further data collection necessary (PHRI=research value);
- X=Important for information content, no further data collection necessary (PHRI=research value, SHPO=not significant);
- B=Excellent example of site type at local, region, island, state, or national level (PHRI=interpretive value); and
- C=Culturally significant (PHRI=cultural value).

**Recommended General Treatments:**

- FDC=Further data collection necessary (intensive survey, test excavations, and/or data recovery [mitigation excavations]);
- NFW=No further work of any kind necessary, sufficient data collected, archaeological clearance recommended, minimal preservation potential (possible inclusion into landscaping suggested for consideration);
- PID=Preservation, with some level of interpretive development recommended (including appropriate related data recovery work); and
- PAI=Preservation "as is," with no further work (possible inclusion into landscaping suggested for consideration).

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Table 6. (Cont.)

| Site or Feature No. | Significance Category |    |   | Recommended Treatment |     |     |     |     |
|---------------------|-----------------------|----|---|-----------------------|-----|-----|-----|-----|
|                     | A                     | X  | B | C                     | FDC | NFW | PID | PAT |
| T-110               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-111               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-112               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-113               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-114               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-115               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-116               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-117               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-118               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-119               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-120               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-121               | -                     | +  | - | -                     | -   | +   | -   | -   |
| T-122               | -                     | +  | - | -                     | -   | +   | -   | -   |
| Subtotal: 23        | 0                     | 23 | 0 | 0                     | 0   | 23  | 0   | 0   |
| Total: 25           | 1                     | 24 | 2 | 1                     | 1   | 23  | 2   | 0   |

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Table 1.

SUMMARY OF IDENTIFIED SITES AND FEATURES  
SOUTHERNMOST PORTION OF SOUTH KOHALA RESORT  
(TMS:3-6-6-02:37; 3-6-2-02:12)

| Site & Feature Number        | Formal Site/Feature Type                  | Tentative Functional Interpretation | *Significance Evaluation |   |   | Recommended Action | Comments                                                                                                                             |
|------------------------------|-------------------------------------------|-------------------------------------|--------------------------|---|---|--------------------|--------------------------------------------------------------------------------------------------------------------------------------|
|                              |                                           |                                     | R                        | I | C |                    |                                                                                                                                      |
| <u>Previously Identified</u> |                                           |                                     |                          |   |   |                    |                                                                                                                                      |
| 5629 F                       | Complex (3) Platform/enclosure            | Habitat                             | H                        | H | L | Int. Sur. Testing  | Portable remains include marine shell midden, coral, water-worn basalt, and volcanic glass artifacts; excellent excavation potential |
| H                            | L-shaped terrace                          |                                     |                          |   |   |                    |                                                                                                                                      |
| I                            | Surface artifact and midden concentration |                                     |                          |   |   |                    |                                                                                                                                      |
| Trail 9                      | Foot trail                                | Transportation                      | M                        | H | M | Preserve           | Preserve for shoreline access; presently utilized by hikers and fishermen                                                            |
| Road 10                      | Road                                      | Transportation                      | L                        | L | L | None               | Historic Kawaihae-Puako Road                                                                                                         |
| T-113                        | Cairn                                     | Boundary marker                     | L                        | L | L | None               | Located near ahupua'a boundary                                                                                                       |
| T-114                        | Cairn                                     | Boundary marker                     | L                        | L | L | None               | Located near ahupua'a boundary                                                                                                       |
| T-115                        | Cairn                                     | Boundary marker                     | L                        | L | L | None               | Located near ahupua'a boundary                                                                                                       |
| <u>Newly Identified</u>      |                                           |                                     |                          |   |   |                    |                                                                                                                                      |
| T-101                        | Terrace wall                              | Building Foundation                 | L                        | L | L | None               | Recently constructed; associated with recreation facilities                                                                          |
| T-102                        | Terrace wall                              | Road foundation                     | L                        | L | L | None               | Recently constructed; associated with recreation facilities                                                                          |

\*Significance Evaluation--Nature: R = scientific research, I = interpretive, C = cultural;  
Degree: H = high, M = moderate, L = low.

#Number of component features within complex.

Table 1. (Cont.)

| Site & Feature Number | Formal Site/Feature Type   | Tentative Functional Interpretation | Significance Evaluation |   |   | Recommended Action | Comments                                                                        |
|-----------------------|----------------------------|-------------------------------------|-------------------------|---|---|--------------------|---------------------------------------------------------------------------------|
|                       |                            |                                     | R                       | I | C |                    |                                                                                 |
| T-103                 | Terrace wall               | Barbecue area foundation            | L                       | L | L | None               | Recently constructed; associated with recreation facilities                     |
| T-104 A               | Complex (2) Double C-shape | Habitation                          | M                       | L | L | None               | Central wall divides Fea. A into two "rooms"; shell midden                      |
| T-105                 | L-shaped wall              | Shelter                             | L                       | L | L | None               | Partially altered by bulldozing; very sparse shell midden                       |
| T-106                 | Rectangular mound          | Habitation                          | L                       | L | L | None               | Partially altered by bulldozing; very sparse shell midden                       |
| T-107                 | C-shape                    | Shelter                             | L                       | L | L | None               | Recently constructed military shelter                                           |
| T-108                 | Collapsed C-shape          | Shelter                             | L                       | L | L | None               | No shell midden                                                                 |
| T-109                 | C-shape                    | Shelter                             | L                       | L | L | None               | No shell midden                                                                 |
| T-110                 | Cairn                      | Boundary marker                     | L                       | L | L | None               | Located near ahupua'a boundary                                                  |
| T-111                 | Cairn                      | Undetermined                        | L                       | L | L | None               | No portable remains or trail visible in area                                    |
| T-112                 | Cairn                      | Boundary marker                     | L                       | L | L | None               | Recently constructed on property boundary; contains wood pole and wire supports |
| T-116                 | Cairn                      | Undetermined                        | L                       | L | L | None               | No portable remains or trail visible in area                                    |
| T-117                 | Boulder alignment          | Undetermined                        | L                       | L | L | None               | Stacked boulders form short north-south alignment                               |

Table 1. (Cont.)

| Site & Feature Number | Formal Site/Feature Type | Tentative Functional Interpretation | Significance Evaluation |   |   | Recommended Action | Comments                                         |
|-----------------------|--------------------------|-------------------------------------|-------------------------|---|---|--------------------|--------------------------------------------------|
|                       |                          |                                     | R                       | I | C |                    |                                                  |
| T-118                 | Cairn                    | Undetermined                        | L                       | L | L | None               | No portable remains or trail visible in area     |
| T-119                 | Wall segment             | Shelter                             | L                       | L | L | None               | No portable remains                              |
| T-120                 | Enclosure                | Habitation                          | M                       | L | L | None               | Interior soil area has shell midden              |
| T-121                 | Historic refuse          | Habitation                          | L                       | L | L | None               | Historic glass, ceramic, and metal items present |
| T-122                 | Historic structure       | Habitation                          | L                       | L | L | None               | Wood and corrugated iron platform and animal pen |

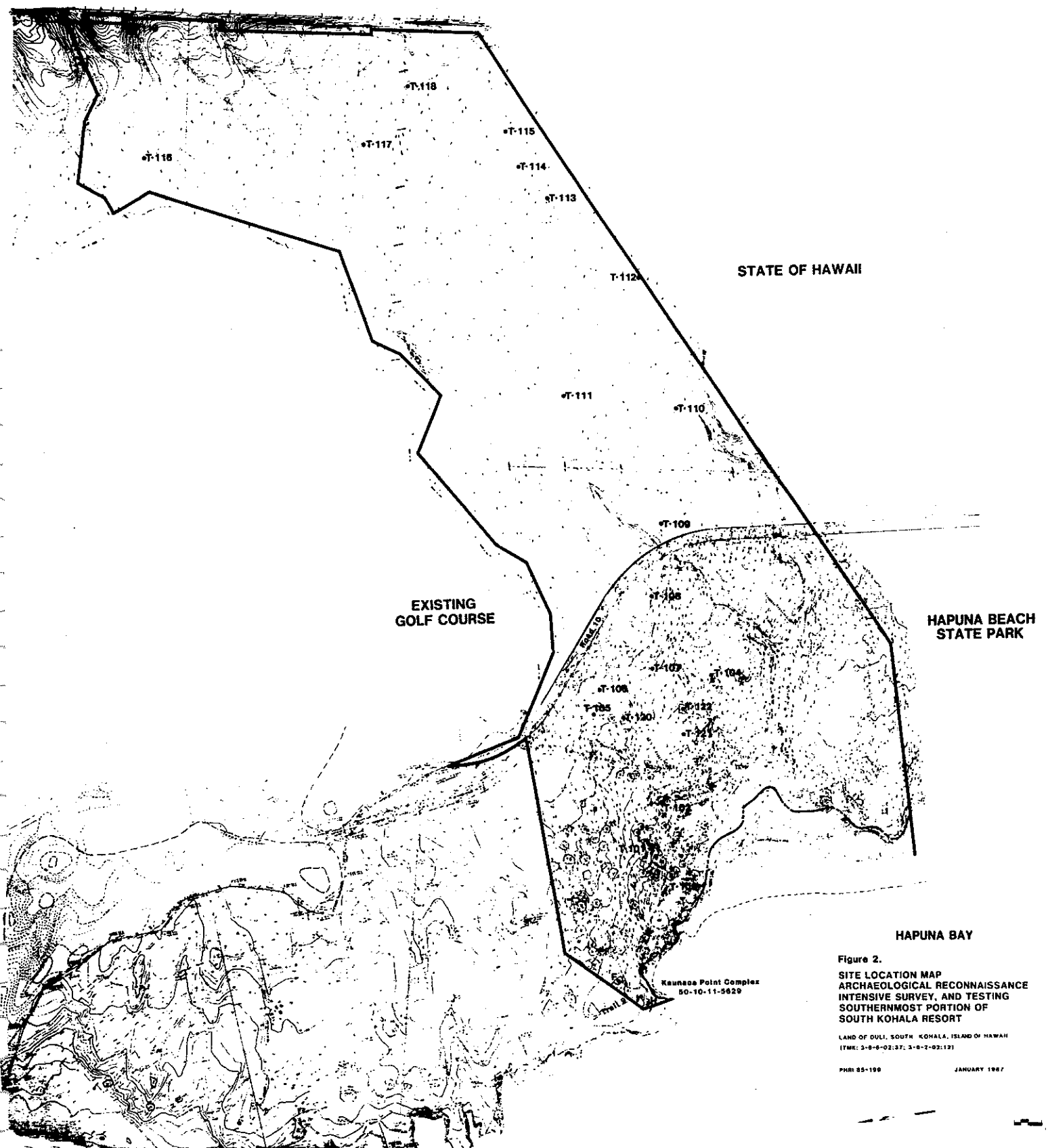


Figure 2.  
 SITE LOCATION MAP  
 ARCHAEOLOGICAL RECONNAISSANCE  
 INTENSIVE SURVEY, AND TESTING  
 SOUTHERNMOST PORTION OF  
 SOUTH KOHALA RESORT  
 LAND OF OULI, SOUTH KOHALA, ISLAND OF HAWAII  
 (TME: 3-8-8-02:37; 3-8-2-02:12)  
 PHRI 85-190                      JANUARY 1987

# APPENDIX H

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June 1, 1987

## SUMMARY

1. The proposed South Kohala Resort will involve site preparation and construction of a self-contained oceanfront resort including a luxury class hotel, tennis complex, and 18 hole golf course on approximately 500 acres of land adjacent to the existing Mauna Kea Resort on the island of Hawaii. Portions of the property to be developed are located both mauka and makai of Queen Kaahumanu Highway and a new project entry road with an underpass to the portion of the site on the mauka side of the highway will be constructed.

2. Present air quality in the project area is estimated to be almost pristine.

3. Except for short term dust emissions during the construction phase of the development, no significant direct air quality impacts are expected. Adequate control measures exist to limit the scope of this impact, but special care will have to be exerted to insure that the Mauna Kea Resort is not subjected to excessive levels of particulate pollution from construction activities.

4. Indirect air quality impacts are expected to result from new demands for electrical energy. This impact is most likely to occur in the vicinity of existing power plants elsewhere on the island of Hawaii where increased levels of particulates, sulfur dioxide and nitrogen dioxide can be expected. Maximum use of solar energy designs in project development can at least partially mitigate the magnitude of this impact. New methods of generating electrical power such as wind or ocean thermal energy conversion may eventually also play a mitigative role in this regard.

5. Increased traffic generated by the proposed South Kohala Resort will increase emissions of carbon monoxide and nitrogen dioxide in the project area. Detailed carbon monoxide modeling carried out as a part of this study indicates that current levels of carbon monoxide near the proposed project entry road intersection are very low, even under worst case traffic and meteorological dispersion conditions. Construction of the new intersection and the addition of project related traffic will substantially increase these worst case carbon monoxide levels, but even after project construction all applicable State of Hawaii and National air quality standards will be met.

6. Other than paving and landscaping project grounds as early in the development process as possible, no other specific mitigative measures are proposed.

## 1. PROJECT DESCRIPTION

Mauna Kea Properties, Inc., proposes to develop an oceanfront resort at South Kohala on approximately 500 acres of land located adjacent to the existing Mauna Kea Resort as shown in Figure 1. Lands to be developed are located both makai and mauka of Queen Kaahumanu Highway. The 100 acres makai of the highway are in the Special Management Area. The South Kohala Resort would be developed as a separate entity from the existing Mauna Kea Resort. The focus of the resort will be a luxury class hotel with a tennis complex and an 18-hole championship golf course and clubhouse. A beach club, recreation community center, and support and maintenance facilities are also planned. Roadway access to the proposed project would be via a new entry road to be constructed from Queen Kaahumanu Highway as shown in Figure 2, with an underpass to lands mauka of the highway as indicated.

The purpose of this study is to describe existing ambient air quality in the project area and to estimate the magnitude of any increase in air pollutant concentrations resulting from actions related to the proposed project.

## 2. AIR QUALITY STANDARDS

State of Hawaii and National Ambient Air Quality Standards (AQS) have been established for six classes of pollutants as shown in Table 1. An AQS is a pollutant concentration not to be exceeded over a specified sampling period which varies for each pollutant depending upon the type of exposure necessary to cause adverse effects. Each of the regulated pollutants has the potential to cause some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration.

National AQS have been divided into primary and secondary levels. Primary AQS are designed to prevent adverse health impacts while secondary AQS refer to welfare impacts such as decreased visibility, diminished comfort levels, damage to vegetation, animals or property, or a reduction in the overall aesthetic quality of the atmosphere. State of Hawaii AQS have been set at a single level which is in most cases significantly more stringent than the lowest comparable national limit. In particular, the State of Hawaii one hour standard for carbon monoxide is four times more stringent than the National standard.

National AQS are based on 40 CFR Part 50, while State of Hawaii AQS are set in Chapter 11-59, Hawaii Administrative Rules. This chapter was recently amended (March 25, 1986) to make Hawaii AQS for particulates and sulfur dioxide essentially the same as the most stringent National limits.

## 3. PRESENT AIR QUALITY

A summary of air pollutant measurements from State of Hawaii long term monitoring stations located nearest to the project is presented in Table 2. Data from several different sampling stations are included in the tabulation.

There are no long term sampling stations located in the immediate vicinity of the project, but particulate and sulfur dioxide monitoring has been conducted at several locations on the Island of Hawaii over the past several years. Particulate data in Table 2 from 1980 to 1982 is from Honokaa, located about 26 miles east of the project site. Measurements for 1983 and 1984 are from Hilo, about 55 miles to the southeast. In August, 1985, a particulate monitoring station was established at Kona, about 27 miles south southwest, but this station was disestablished in August, 1986. Sulfur dioxide measurements from 1980 through 1984 are from Hilo, while those for 1985 and 1986 are from Kona.

Statewide monitoring for other regulated pollutants has been confined to the island of Oahu. During 1981 carbon monoxide was measured at Fort DeRussy in Waikeiki, and in 1982 and 1983 carbon monoxide was monitored at Leahi Hospital in Kaimuki. Carbon monoxide readings from 1984 onward are from the DOH building in urban Honolulu.

Ozone levels were also measured at the Department of Health building until December 1980, when the monitor was relocated to Sand Island. During 1981 nitrogen dioxide was also monitored at the Sand Island location, but all nitrogen dioxide monitoring has since been discontinued. Lead measurements are from Kalia Street in Kalihi.

From the data presented in Table 2 it appears that State of Hawaii ambient air quality standards for particulates, sulfur dioxide, nitrogen dioxide, and lead are currently being met at nearest monitoring stations to the project area.

On the other hand, carbon monoxide and ozone readings from urban Honolulu indicate that allowable State of Hawaii standards for these vehicle-related air pollutants are being violated at a rate of about once or twice a year. Ozone is an indicator of the formation of photochemical pollutants in the air, a condition which tends to develop if the air mass over the islands has been fairly stable with little wind flow for a period stretching over several days.

Concentrations of carbon monoxide are more directly related to vehicular emissions and tend to be highest during periods of rush hour traffic. Carbon monoxide would thus be the pollutant most likely to cause difficulty in meeting allowable State of Hawaii AQS as a result of new development on any of the islands.

#### 4. DIRECT AIR QUALITY IMPACT OF PROJECT CONSTRUCTION

During the site preparation and construction phases of this project it is inevitable that a certain amount of fugitive dust will be generated. Field measurements of such emissions from apartment and shopping center construction projects has yielded an estimated emission rate of 1.2 tons of dust per acre of construction per month of activity. This figure assumes medium level activity in a semi-arid climate with a moderate soil silt content. Actual emissions of fugitive dust from this project can be expected to vary greatly depending upon the type of activity being conducted on any given day. Since there is essentially no existing soil cover, excavation will require blasting and landscaping will require a significant amount of dirt hauling. Both of these activities have a high likelihood of creating significant fugitive dust emissions.

Another major generator of fugitive dust is heavy construction equipment moving over unpaved surfaces. This problem can be substantially mitigated by completing and paving roadways and parking areas as early in the development process as possible, but special care will have to be exercised to avoid creating a fugitive dust problem for the adjacent Mauna Kea Resort.

Heavy construction equipment will also emit some air pollutants in the form of engine exhausts. The largest equipment is usually diesel-powered. Carbon monoxide emissions from large diesel engines are generally about equal to those from a single automobile, but nitrogen dioxide emissions from this type of engine can be quite high. Fortunately, nitrogen dioxide emissions from other sources in the area should be relatively low and the overall impact of exhaust pollutant emissions from construction equipment should be minor.

#### 5. AIR QUALITY IMPACT OF INCREASED ENERGY UTILIZATION

Hotels are estimated to require about 26 million BTU of energy at the power plant for every square foot of floor space. At present the total annual energy requirements for the proposed South Kohala Resort are difficult to quantify, but it is safe to conclude that these requirements will be substantial.

At present electrical power on the island of Hawaii is generated primarily by the combustion of fuel oil, diesel oil, or bagasse at steam turbine plants. Recently coal has been tested as a potential substitute for oil, and a small amount of electricity is also being generated from geothermal sources.

Increasing geothermal development is likely to result in increased emissions of hydrogen sulfide in the Puna area, while combustion of increased amounts of bagasse or fossil fuels will result in increased levels of particulates, sulfur dioxide, and nitrogen oxides in the vicinity of existing power plants.

To a certain extent the potential air quality impact of increased energy utilization by the proposed South Kohala Resort can be mitigated by giving maximum consideration to the potential energy savings which can accrue from inclusion of solar energy technologies such as water heating or panels of solar energy cells on hotel roof tops, as well as architectural design features which minimize air conditioning needs.

It is also possible that larger scale, "clean" electrical generating systems such as wind farms and ocean thermal energy conversion may be providing some of the required energy needs of the project within the next few decades.

## 6. INDIRECT AIR QUALITY IMPACT OF INCREASED TRAFFIC

Once construction is completed the proposed project will not in itself constitute a major direct source of air pollutants. By serving as an attraction for increased motor vehicle traffic in the area, however, the project must be considered to be a potential indirect air pollution source.

Motor vehicles, especially those with gasoline-powered engines, are prodigious emitters of carbon monoxide. Motor vehicles also emit some nitrogen dioxide and those burning fuel which contains lead as an additive contribute some lead particles to the atmosphere as well. The major control measure designed to limit lead emissions is a Federal law requiring the use of unleaded fuel in most new automobiles. As older cars are removed from the vehicle fleet lead emissions should continue to fall. In fact, effective January 1, 1986, the Federal Environmental Protection Agency has revised the allowable lead amount in gasoline to 0.1 gram per gallon. At the beginning of 1985 the standard was 1.1 grams per gallon. The EPA is also advocating a total ban on lead in gasoline to take effect as early as 1988.

Federal control regulations also call for increased efficiency in removing carbon monoxide and nitrogen dioxide from vehicle exhausts. By 1999 carbon monoxide emissions from the vehicle fleet then operating should be little more than half the amounts now emitted. At present, however, no further reductions in vehicular emissions have been mandated for years following 1995, and increases in traffic levels after 1995 will result in directly proportional increases in vehicle-related pollutant emissions.

## 7. CARBON MONOXIDE DIFFUSION MODELING

In order to evaluate the air quality impact of projected increases in traffic associated with the proposed project a detailed carbon monoxide modeling study was carried out. The study was designed to yield carbon monoxide concentration values which could be compared directly to allowable State and National Ambient Air Quality Standards.

Just one critical intersection was selected for analysis. The traffic study for the project indicates that the major impact of new traffic associated with South Kohala Resort will be at the proposed new intersection of the resort entry road and Queen Kaahumanu Highway. With the addition of exclusive right and left turn lanes and an underpass to provide access to lands mauka of the highway, it is proposed that this intersection can remain unsignalized, thus providing adequate service to traffic entering and leaving the project with minimum disruption to through traffic on Queen Kaahumanu Highway. Peak hour volume at this location is during the afternoon rush rather than in the morning. Forecast peak hour traffic volumes at this intersection indicate that highest traffic-related levels of carbon monoxide would be most likely to occur along the north side of the project entry road (within the project boundaries).

Modeling was performed for a string of receptor sites located 10 meters from the edge of the resort entry road and highest levels (after project construction) occurred at a single receptor site located about 30 meters makai of Queen Kaahumanu Highway. This site is marked on Figure 2.

Computations were made for current peak hour conditions and for study year 1999 (after project completion). Calculations for 1999 included peak hour traffic volume scenarios with and without the proposed project.

Using an afternoon peak hour vehicle count taken on Monday, May 4, 1987, the existing peak hour vehicle mix in the project area is estimated to be 73% light duty gasoline-powered vehicles, 20% light duty gasoline-powered trucks and vans between 6000 and 8500 pounds, 4% heavy duty gasoline-powered vehicles, and 2% diesel-powered trucks and buses. The same vehicle mix was assumed for 1999 emission rate calculations. The relatively high percentage of trucks in the vehicle mix is largely because of the proximity of Kawaihae harbor just to the north of the project site.



Average vehicle speeds were assumed to be 1 mph upstream from the unsignalized intersection and 15 mph downstream from turns. For through traffic on Queen Kaahumanu Highway an average speed of 35 mph was assumed. An ambient temperature of 65 degrees F was used to simulate a cool winter afternoon with 20.6 percent of vehicles equipped with catalytic converters and 20.6 percent of vehicles without catalytic converters operating in the "cold start" mode and 27.3 percent of all vehicles operating in the hot start mode. The EPA computer model MOBILES3 was run using the above parameters to produce vehicular carbon monoxide emission estimates for each of the years studied.

The EPA computer model HIWAY 2 was used to calculate carbon monoxide concentrations at each of the selected receptor sites for each scenario studied. Stability category 4 was used for determining diffusion coefficients. This stability category represents the most stable (least favorable) atmospheric condition that would be likely to occur in the afternoon in a rural area such as this.

To simulate worst case wind conditions a uniform wind speed of one meter per second was assumed with the worst case wind direction from the southeast. For each receptor site concentrations were computed at a height of 1.5 meters in order to estimate levels that would exist within the normal human breathing zone.

Background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were assumed to be zero.

Results of the peak hour carbon monoxide study are presented in Table 3. Present peak hour carbon monoxide levels under the worst case assumptions used here are essentially negligible. Computed worst values for the 1999 scenario with project construction are significantly higher, but still well within the allowable State of Hawaii and National standards.

Eight hour carbon monoxide levels are estimated by multiplying the peak hour values by a "meteorological persistence factor" of 0.6 which is recommended in EPA modeling guidelines to account for the fact that average one hour traffic volumes over an eight hour period are lower than peak hour volume and the fact that meteorological dispersion conditions are more variable (and hence more favorable) over an eight hour period than they are for a one hour period. Multiplying projected peak hour carbon monoxide levels by this factor yields the values that are shown in Table 4.

As was the case for the peak hour situation, all eight hour worst case carbon monoxide levels are well within allowable State and National limits.

## 8. MITIGATIVE MEASURES

### A. SHORT TERM

As previously indicated the only direct adverse air quality impact that the proposed project is likely to create is the emission of fugitive dust during construction. State of Hawaii regulations stipulate the control measures that are to be employed to reduce this type of emissions. Primary control consists of wetting down loose soil areas. An effective watering program can reduce particulate emission levels from construction sites by as much as 50 percent. Other control measures include good housekeeping on the job site and pavement or landscaping of bare soil areas as quickly as possible.

### B. LONG TERM

Once completed, the proposed South Kohala Resort is expected to have little direct impact on the air quality of the surrounding region. Indirect long term impacts in the form of increased air pollutant emissions from power plants serving the project can be mitigated somewhat by planning and implementing solar energy design features to the maximum extent possible.

Other indirect long term air quality impacts are expected in those areas where traffic congestion can potentially be worsened by the addition of vehicles traveling to and from the proposed project.

Detailed carbon monoxide modeling at the major intersection impacted by the project indicates that present levels of carbon monoxide there, even under worst case traffic and meteorological conditions, are almost negligible. While the proposed project will increase these levels significantly, projected worst case levels after project completion are well within allowable State of Hawaii and National air quality standards. For that reason, no specific mitigative measures seem necessary in this regard. It is worth noting, however, that the planting and establishment of a stand of dense vegetation (trees and shrubs) near the major project intersection can help to decrease the levels of roadway-generated particulates which reach residents or resort-goers within the project boundaries.

Because the stringent national vehicular emissions reduction program now being pursued is entirely the product of ever changing government regulations, it is always possible that economic conditions or other factors could lead to an early abandonment of this program. If that were to occur, then the projected pollutant levels presented in this study could be too optimistic. On the other hand, this analysis did not consider the possibility that technological innovation may lead to new vehicular power systems that produce few or none of the currently regulated atmospheric pollutants.

REFERENCES

1. U.S. ENVIRONMENTAL PROTECTION AGENCY, User's Guide to MOBILE3: Mobile Source Emissions Model, June, 1984.
2. U.S. ENVIRONMENTAL PROTECTION AGENCY, User's Guide to HIWAY 2, A Highway Air Pollution Model, May, 1980.
3. U.S. ENVIRONMENTAL PROTECTION AGENCY, Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources, January, 1975, revised September, 1978.
4. CALIFORNIA DEPARTMENT OF TRANSPORTATION, Energy and Transportation Systems, December, 1978.
5. MORROW, J.W., Air Quality Impact Analysis, Kaupulehu Resort April, 1986.

TABLE 1

SUMMARY OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS  
(Micrograms per Cubic Meter)

| POLLUTANT        | SAMPLING PERIOD         | AMBIENT AIR QUALITY STANDARDS |        |
|------------------|-------------------------|-------------------------------|--------|
|                  |                         | NATIONAL                      | HAWAII |
| Particulates     | Annual Geometric Mean   | 75                            | 60     |
|                  | Maximum 24-Hour Average | 260                           | 150    |
| Sulfur Dioxide   | Annual Arithmetic Mean  | 80                            | 80     |
|                  | Maximum 24-Hour Average | 365                           | 365    |
|                  | Maximum 3-Hour Average  | 1300                          | 1300   |
| Nitrogen Dioxide | Annual Arithmetic Mean  | 100                           | 70     |
| Ozone            | Maximum 1-Hour Average  | 240                           | 100    |
| Carbon Monoxide  | Maximum 8-Hour Average  | 10                            | 5      |
|                  | Maximum 1-Hour Average  | 40                            | 10     |
| Lead             | Calendar Quarter        | 1.5                           | 1.5    |

- Notes: 1. Carbon monoxide standards are in milligrams per cubic meter.  
2. National standards based on 40 CFR Part 50; Hawaii standards based on Title 11, Administrative Rules, Chapter 59.

TABLE 2

SUMMARY OF AIR POLLUTANT MEASUREMENTS AT NEAREST MONITORING STATIONS

| POLLUTANT                       | 1980     | 1981   | 1982  | 1983   | 1984   | 1985   | 1986   |
|---------------------------------|----------|--------|-------|--------|--------|--------|--------|
| <b>PARTICULATE MATTER</b>       |          |        |       |        |        |        |        |
| No. of Samples                  | 50       | 52     | 21    | 47     | 55     | 34     | 40     |
| Range of Values                 | 11-49    | 12-66  | 10-25 | 7-50   | 7-27   | 6-22   | 4-28   |
| Average Value                   | 23       | 24     | 16    | 17     | 15     | 12     | 16     |
| No. of Times State AQS Exceeded | 0        | 0      | 0     | 0      | 0      | 0      | 0      |
| <b>SULFUR DIOXIDE</b>           |          |        |       |        |        |        |        |
| No. of Samples                  | 46       | 45     | 45    | 43     | 50     | 31     | 40     |
| Range of Values                 | <5-17    | <5-11  | <5-6  | <5-23  | <5-7   | <5-8   | <5-12  |
| Average Value                   | <5       | <5     | <5    | <5     | <5     | <5     | <5     |
| No. of Times State AQS Exceeded | 0        | 0      | 0     | 0      | 0      | 0      | 0      |
| <b>CARBON MONOXIDE</b>          |          |        |       |        |        |        |        |
| No. of Samples                  | 286      | 311    | 311   | 173    | 318    | 342    | 258    |
| Range of Values                 | 1.2-13.8 | 0-4.6  | 0-8.6 | 0-10.9 | 0-10.4 | 0-13.5 | 0-13.5 |
| Average Value                   | 5.1      | 1.2    | 2.3   | 2.4    | 1.5    | 2.2    | 2.2    |
| No. of Times State AQS Exceeded | 13       | 0      | 0     | 0      | 1      | 1      | 2      |
| <b>OXIDANT (OZONE)</b>          |          |        |       |        |        |        |        |
| No. of Samples                  | 295      | 314    | 335   | 349    | 296    | 341    | 294    |
| Range of Values                 | 10-84    | 10-104 | 0-151 | 0-123  | 0-104  | 8-198  | 10-88  |
| Average Value                   | 48       | 37     | 32    | 46     | 44     | 43     | 34     |
| No. of Times State AQS Exceeded | 0        | 1      | 2     | 2      | 1      | 3      | 0      |
| <b>OTHERS:</b>                  |          |        |       |        |        |        |        |
| <b>NITROGEN DIOXIDE</b>         |          |        |       |        |        |        |        |
| No. of Samples                  | 46       | 58     | 52    | 58     | 58     | 58     | 46     |
| Range of Values                 | 6-77     | 5-8    | 0.5   | 0.5    | 0.5    | 0.5    | 0.3    |
| Average Value                   | 25       | 0.6    | 0.2   | 0.1    | 0.1    | 0.1    | 0.1    |
| No. of Times State AQS Exceeded | 0        | 0      | 0     | 0      | 0      | 0      | 0      |

NOTES: See text for locations of monitoring stations. Carbon monoxide is reported in milligrams per cubic meter; other pollutants in micrograms per cubic meter. Carbon monoxide and ozone are daily peak one hour values; lead is quarterly; other pollutant values are for a 24 hour sampling period. Data for 1986 are for the first three quarters of the year.

SOURCE: State of Hawaii Department of Health

TABLE 3

RESULTS OF PEAK HOUR CARBON MONOXIDE ANALYSIS  
(Milligrams Per Cubic Meter)

AT CRITICAL RECEPTOR SITE NEAR QUEEN KAAHUMANU HIGHWAY AND NEW SOUTH KOHALA RESORT ENTRY INTERSECTION

| SCENARIO                    | YEAR | 1987 | 1989 |
|-----------------------------|------|------|------|
| Without South Kohala Resort |      | 0.3  | 0.6  |
| With South Kohala Resort    |      | 6.6  | 6.6  |

STATE OF HAWAII AQS: 10  
NATIONAL AQS: 40

Notes: See Figure 2 for location of critical receptor site. See text, Section 7, for models and assumptions used for producing these estimates. The 1989 scenario with South Kohala Resort includes traffic from other projects slated for completion in the area by that date.

TABLE 4

RESULTS OF EIGHT HOUR CARBON MONOXIDE ANALYSIS  
(Milligrams Per Cubic Meter)

AT CRITICAL RECEPTOR SITE NEAR QUEEN KAAHUMANU HIGHWAY AND NEW  
SOUTH KOHALA RESORT ENTRY INTERSECTION

| SCENARIO                    | YEAR | 1987 | 1999 |
|-----------------------------|------|------|------|
| Without South Kohala Resort |      | 0.2  | 0.4  |
| With South Kohala Resort    |      |      | 4.0  |

STATE OF HAWAII AQS: 5  
NATIONAL AQS: 10

Note: See notes for Table 3.

APPENDIX I

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UPDATED ACOUSTIC STUDY  
OF  
THE PROPOSED SOUTH KOHALA RESORT

PREPARED FOR  
BELT, COLLINS & ASSOCIATES

BY  
Y. EHSU & ASSOCIATES

JUNE, 1987

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## I. SUMMARY

This study was performed to update and expand upon the original acoustic study for the proposed South Kohala Resort, which was formerly called the Hapuna Beach Resort. The original study ("Traffic Noise Impacts Resulting from the Proposed Stone Bluffs Development at Mauna Kea Beach and from the Proposed Hapuna Beach Resort;" May 30, 1984; by Darby-Ebisu & Associates, Inc.), concluded that traffic noise along Queen Kaahumanu Highway will increase significantly by the Year 1995 as a result of the South Kohala Resort's traffic. For this reason, noise mitigation measures were recommended for the proposed High Bluffs development adjacent to the highway.

A reevaluation of the potential traffic noise impacts associated with the proposed South Kohala Resort was performed utilizing the most recent concept plans for the resort. Traffic volumes and noise level predictions were updated to include existing (Base Year) and future study years of 1987 and 1998, respectively. It was concluded that traffic noise along Queen Kaahumanu Highway will increase significantly by 1998 as a result of project and non-project traffic, with project traffic contributing to 30 percent of the increase. Traffic noise levels will rise by 3 Ldn units from Base Year noise levels, and noise exposure at existing homes near the project will increase from the "Minimal Exposure" to the "Moderate Exposure" category. The proposed High Bluffs development and the proposed multifamily Parcel "P" near the highway may be adversely impacted by traffic noise, and mitigation measures are recommended for affected units.

Additionally, expressed concerns regarding noise intrusion from hotel activities on users of Hapuna Beach, plus the potential for increased helicopter noise annoyance were also discussed. Recommendations for minimizing future noise impacts were provided when applicable.

## II. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY\*

A general consensus has developed for using the Day-Night Sound Level (Ldn) in describing environmental noise in general, and for relating the acceptability of the noise environment for various land uses. The Day-Night Sound Level represents the 24-hour average sound level for a given day, with nighttime noise levels (10:00 P.M. to 7:00 A.M.) increased by 10 decibels prior to computation of the 24-hour average.

TABLE 1, extracted from Reference 1, categorizes the various Ldn levels of outdoor noise exposure with severity classifications. TABLE 2, also extracted from Reference 1, presents the general effects of noise on people in residential use situations. FIGURE 1, extracted from Reference 2, presents suggested land use compatibility guidelines for residential and nonresidential land uses. A general consensus among federal agencies has developed whereby residential housing development is considered acceptable in areas where exterior noise does not exceed 65 Ldn. This value of 65 Ldn is used as a federal regulatory threshold for determining the necessity for special noise abatement measures when federal funding assistance is applied for.

Federal agencies (HUD, DOT, and EPA) recognize 55 Ldn as a desirable goal for exterior noise in residential areas for protecting the public health and welfare with an adequate margin of safety. Although 55 Ldn is significantly quieter than 65 Ldn, the lower level has not been adopted for regulatory purposes by federal agencies due to economic and technical feasibility considerations.

In Hawaii, where open living conditions prevail throughout the year, and where natural ventilation is a prevalent characteristic of residential housing, the more conservative level of 55 Ldn should be used to evaluate potential noise impacts. This is particularly true whenever relatively quiet areas, such as

\*A brief description of the acoustic terminology and symbols used are provided in APPENDIX B.

TABLE 1  
EXTERIOR NOISE EXPOSURE CLASSIFICATION  
(RESIDENTIAL LAND USE)

| Noise Exposure Class | Day-Night Sound Level             | Equivalent Sound Level            | Federal Standard (1)       |
|----------------------|-----------------------------------|-----------------------------------|----------------------------|
| Minimal Exposure     | Not Exceeding 55 Ldn              | Not Exceeding 55 Leq              | Unconditionally Acceptable |
| Moderate Exposure    | Above 55 Ldn But Not Above 65 Ldn | Above 55 Leq But Not Above 65 Leq | Acceptable (2)             |
| Significant Exposure | Above 65 Ldn But Not Above 75 Ldn | Above 65 Leq But Not Above 75 Leq | Normally Unacceptable      |
| Severe Exposure      | Above 75 Ldn                      | Above 75 Leq                      | Unacceptable               |

Note: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours.

Source: Reference 1.

TABLE 2  
EFFECTS OF NOISE ON PEOPLE  
(Residential Land Uses Only)

| General Community Attitude Towards Area | Average Community Reaction | Speech Interference |         | % Sentence Intelligibility | Distance in Feet for 95% Sentence Intelligibility                                             | % of Population Highly Annoyed | Very Severe | Severe | Significant | Moderate | Slight | Noise considered no more important than various other environmental factors. |
|-----------------------------------------|----------------------------|---------------------|---------|----------------------------|-----------------------------------------------------------------------------------------------|--------------------------------|-------------|--------|-------------|----------|--------|------------------------------------------------------------------------------|
|                                         |                            | Indoor              | Outdoor |                            |                                                                                               |                                |             |        |             |          |        |                                                                              |
| 75 and above                            | May Begin to Occur         | 98%                 | 0.5     | 37%                        | Noise is likely to be the most important of all adverse aspects of the community environment. | Very Severe                    | 37%         | 25%    | 15%         | 9%       | 4%     | Noise considered no more important than various other environmental factors. |
| 70                                      | Will Not Likely Occur      | 99%                 | 0.9     | 25%                        | Noise is one of the most important adverse aspects of the community environment.              | Severe                         | 25%         | 15%    | 9%          | 9%       | 4%     | Noise may be considered an adverse aspect of the community environment.      |
| 65                                      | Will Not Occur             | 100%                | 1.5     | 15%                        | Noise is one of the important adverse aspects of the community environment.                   | Significant                    | 15%         | 9%     | 9%          | 9%       | 4%     | Noise considered no more important than various other environmental factors. |
| 60                                      | Will Not Occur             | 100%                | 2.0     | 9%                         | Noise considered no more important than various other environmental factors.                  | Moderate                       | 9%          | 9%     | 9%          | 9%       | 4%     | Noise considered no more important than various other environmental factors. |
| 55 and below                            | Will Not Occur             | 100%                | 3.5     | 4%                         | Noise considered no more important than various other environmental factors.                  | Slight                         | 4%          | 9%     | 9%          | 9%       | 4%     | Noise considered no more important than various other environmental factors. |

1. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document": Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Sciences 1977 report, "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 67 on Evaluation of Environmental Impact of Noise."

2. Depends on attitudes and other factors.  
The percentages of people reporting annoyance to lesser extents are higher to each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. The reason is the difficulty all people have in integrating annoyance over a very long time.



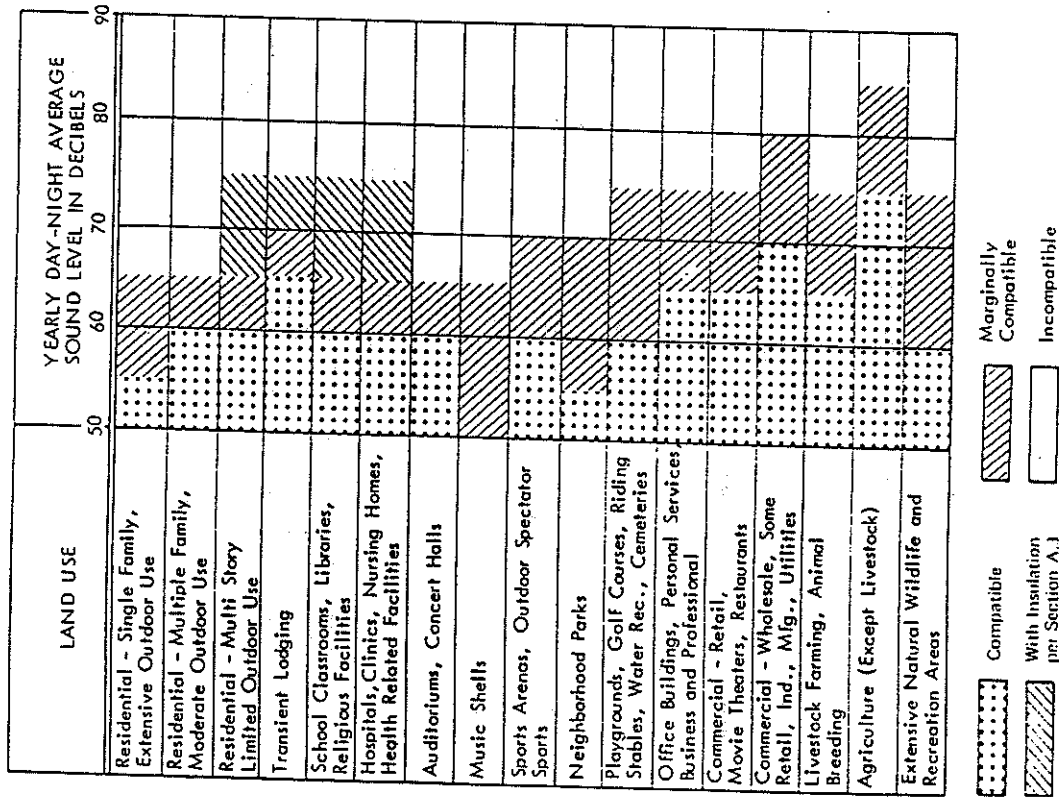


FIG. 1. Land use compatibility with yearly day-night average sound level at a site for buildings as commonly constructed. [For information only; not a part of American National Standard for Sound Level Descriptors for Determination of Compatible Land Use S3.23-1980.]

the Mauna Kea resort area, are under evaluation. Also, at an exterior noise level of 55 Ldn, the noise attenuation characteristics of typical naturally ventilated dwellings produce acceptable noise levels within the dwelling (approximately 46 Ldn).

For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 Ldn are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 Ldn.

For the purposes of this and the prior study of the project, exterior noise contours (lines of equal noise levels) from 50 Ldn to 70 Ldn, in 5 Ldn increments, were used to form the basis for the noise impact evaluations. Naturally ventilated residential units outside the 55 Ldn contour should be considered "Conditionally Acceptable," areas inside the 65 Ldn contour should be considered "Normally Unacceptable," and areas between the 55 Ldn to 65 Ldn should be considered "Acceptable."

noise from tour helicopter operations were also addressed. The unavoidable short term noise impacts during construction were discussed, and mitigation measures recommended.

### III. GENERAL STUDY METHODOLOGY

In the earlier 1984 traffic noise study of the project (see Reference 3), traffic noise contours were developed along Queen Kaahumanu Highway and along the entrance roadway to the Mauna Kea Beach Hotel. The Federal Highway Administration (FHWA) Noise Prediction Model (Reference 4) was used with model parameters adjusted to reflect terrain, ground cover, and local shielding conditions. Base Year noise contours representative of the period from 1982 thru 1984 were generated following on-site noise measurements and noise model calibration. The measured noise levels were compared with model predictions to determine differences between measured and calculated noise levels for the Base Year, and to refine predictions of future traffic noise levels.

In this current traffic noise study, relative changes to the original Base Year contours (FIGURE 3 of Reference 3) which occurred during the 1984 to 1987 period were identified. These relative changes were calculated for the roadway sections modeled in the 1984 study. A copy of the original 1984 noise contours is included in APPENDIX C of this report.

Future Year noise contours originally developed for the 1995 time period under the original development proposal (see FIGURE 4 of Reference 3) are also reproduced in APPENDIX C of this report. In this current study, future traffic projections (Reference 5) for the Year 1998 were used to calculate the relative noise contributions from project and non-project traffic, and to calculate the relative changes to the original 1995 noise contours developed in the prior study. Comparisons of future traffic noise levels with published noise standards and recommendations were also made to determine specific locations where noise abatement measures might be necessary. Noise abatement recommendations were also provided, as applicable, to minimize adverse noise impacts.

Concerns expressed regarding project noise impacts on the users of Hāpuna Beach and regarding the potential for additional

IV. 1987 (BASE YEAR) TRAFFIC NOISE LEVELS

Comparisons of 1984 traffic volumes with more recent 1987 traffic counts on Queen Kaahumanu Highway were made to determine the magnitude of the errors introduced by using the 1984 traffic noise contours to describe the Base Year (1987) traffic noise levels. These comparisons are summarized in TABLE 3. Traffic volumes on the highway have increased by approximately 50 percent during the three year period. Assuming no changes have occurred in vehicle speeds or traffic mix on the highway, a corresponding increase in traffic noise levels of approximately 2 Ldn units has probably occurred from 1984 to 1987. This increase of approximately 2 Ldn units is noted on the Base Year noise contours of FIGURE 3 in APPENDIX C. TABLE 4 presents the maximum setback distances of the 65, 60, and 55 Ldn noise contours from the centerline of Queen Kaahumanu Highway for the 1987 period. The calculations of maximum setback distances in TABLE 4 assumed unobstructed field-of-view to the highway, whereas the traffic noise contours incorporated the noise shielding effects from terrain and topographic features.

TABLE 3  
COMPARISON OF 1984 AND 1987 TRAFFIC VOLUMES AND NOISE LEVELS

| ROADWAY                 | LOCATION                                                    | --- DAILY TRAFFIC VOLUME / Ldn ---<br>1984 | 1987             | INCREASE FROM<br>1984 TO 1987 |
|-------------------------|-------------------------------------------------------------|--------------------------------------------|------------------|-------------------------------|
| Queen Kaahumanu Highway | Fronting the project and south of Mauna Kea Beach entrance. | 3,519 VPD/67 Ldn                           | 5,310 VPD/69 Ldn | + 1.8 Ldn                     |
| Queen Kaahumanu Highway | South of Kawahae Road Intersection (Station 1E, 4 & 8).     | 3,519 VPD/67 Ldn                           | 5,409 VPD/69 Ldn | + 1.9 Ldn                     |

- Notes: 1. Noise levels applicable at 50 FT from roadway's centerline, and for 180 degree field-of-view.
2. As noted in the 1984 traffic noise study, traffic noise model predictions along Queen Kaahumanu Highway may be as much as 5 Ldn units higher than actual values. This condition was based on comparisons of measured and predicted noise levels, which differed by as much as 7 db along the highway. Probable causes of the lower measured noise levels were: the greater mix of new automobiles and light trucks, and the low number of heavy diesel trucks.

TABLE 4  
EXISTING AND FUTURE DISTANCES TO  
65, 60, and 55 Ldn CONTOURS IN PROJECT ENVIRONS

| STREET SECTION                                     | 65 Ldn SETBACK (FT) |      | 60 Ldn SETBACK (FT) |      | 55 Ldn SETBACK (FT) |      |
|----------------------------------------------------|---------------------|------|---------------------|------|---------------------|------|
|                                                    | 1987                | 1998 | 1987                | 1998 | 1987                | 1998 |
| Queen Kaahumanu Highway:<br>S. of MKR Entrance Rd. | 88                  | 163  | 189                 | 351  | 407                 | 756  |
| S. of Kawaihae Rd.                                 | 89                  | 164  | 191                 | 354  | 412                 | 763  |
| S. of SKR Entrance Rd.                             | 89                  | 152  | 191                 | 328  | 412                 | 707  |
| SKR Entrance Road                                  | -                   | 71   | -                   | 154  | -                   | 331  |

Notes: 1. All setback distances are from the roadways' centerlines.  
 2. Ldn assumed to be equal to Peak Hour Leg plus 3.1 dB for Queen Kaahumanu Hwy.  
 3. Ldn assumed to be equal to Peak Hour Leg plus 4.7 dB for South Kohala Resort.  
 Entrance Road.

V. FUTURE TRAFFIC NOISE LEVELS

At the projected completion of the South Kohala Resort (by the Year 1998), traffic volume and noise level increases associated with project and non-project traffic are shown in TABLE 5. Projected increases in non-project traffic are significant, and will triple the Base Year traffic volumes shown in TABLE 3. Traffic noise levels at receptor locations along Queen Kaahumanu Highway are predicted to rise by 2 Ldn units from 1987 to 1998 as a result of non-project traffic. As indicated in TABLE 5, project traffic are predicted to increase non-project noise levels along the highway by approximately 1 Ldn unit. Approximately 30 percent of the total increases in traffic noise level from 1987 to 1998 are expected to be attributable to project traffic, with 70 percent associated with non-project traffic.

As tabulated in TABLE 6, future (1998) traffic noise levels are predicted to be 2 Ldn units greater than those previously projected for 1995 in the 1984 noise study (Reference 3). This increase is noted on the original 1995 noise contours of FIGURE 4, which are reproduced in APPENDIX C. In the 1984 study, the original FIGURE 4 was the future version of the Base Year noise contours of FIGURE 3. Due to the projected increases in traffic from 1984 to 1995, the 70 Ldn contour had been added and the 50 Ldn contour had been deleted when FIGURE 4 was originally constructed. Also, the influence of the proposed South Kohala Resort entrance roadway was included in FIGURE 4.

Under worst case, unobstructed line-of-sight conditions between the receptor and highway, calculated distances from the highway centerline to the future 65, 60, and 55 Ldn contours are shown in TABLE 4. The distances (or widths) of the noise contours are predicted to double by 1998, primarily as a result of non-project traffic.

The predicted traffic noise contours along Queen Kaahumanu Highway in the Year 1998 are shown in FIGURE 2. These future contours assume that existing terrain and topographical features

TABLE 5

PROJECTED YEAR 1998 TRAFFIC VOLUMES AND NOISE LEVELS  
FOLLOWING COMPLETION OF THE SOUTH KOHALA RESORT

| ROADWAY                          | LOCATION                                                              | --- DAILY TRAFFIC VOLUME / Ldn ---<br>NON-PROJ. TRAFFIC | TOTAL TRAFFIC     | INCREASE DUE<br>TO PROJECT |
|----------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------|-------------------|----------------------------|
| Q. Kaahumanu Highway             | South of Kawaihae Road intersection (Station 11E, 4 & 8).             | 18,715 VPD/71 Ldn                                       | 23,420 VPD/72 Ldn | + 1 Ldn                    |
| Q. Kaahumanu Highway             | Between Mauna Kea Beach Hotel and South Kohala Resort Entrance Roads. | 18,405 VPD/71 Ldn                                       | 23,110 VPD/72 Ldn | + 1 Ldn                    |
| Q. Kaahumanu Highway             | South of proposed South Kohala Resort Entrance Road intersection.     | 16,205 VPD/71 Ldn                                       | 20,910 VPD/72 Ldn | + 1 Ldn                    |
| South Kohala Resort Entrance Rd. | At Queen Kaahumanu Hwy. intersection.                                 | -                                                       | 9,410 VPD/67 Ldn  | +67 Ldn                    |

- Notes: 1. Noise levels applicable at 50 FT from roadways' centerlines, and for 180 degree field-of-view.
2. Equal project traffic volumes assumed north and south of South Kohala Resort entrance road.
3. On Queen Kaahumanu Highway, assumed average speed of 42 MPH used; with assumed traffic mix of 93.5% Autos/3.4% Medium Trucks/3.1% Heavy Trucks and Buses; and 3.1 dB peak hour Leq(h) to Ldn correction factor used.
4. On South Kohala Resort Entrance Road, assumed average speed of 35 MPH used; with assumed traffic mix of 93.5% Autos/3.4% Medium Trucks/3.1% Heavy Trucks and Buses; and 4.7 dB peak hour Leq(h) to Ldn correction factor used.

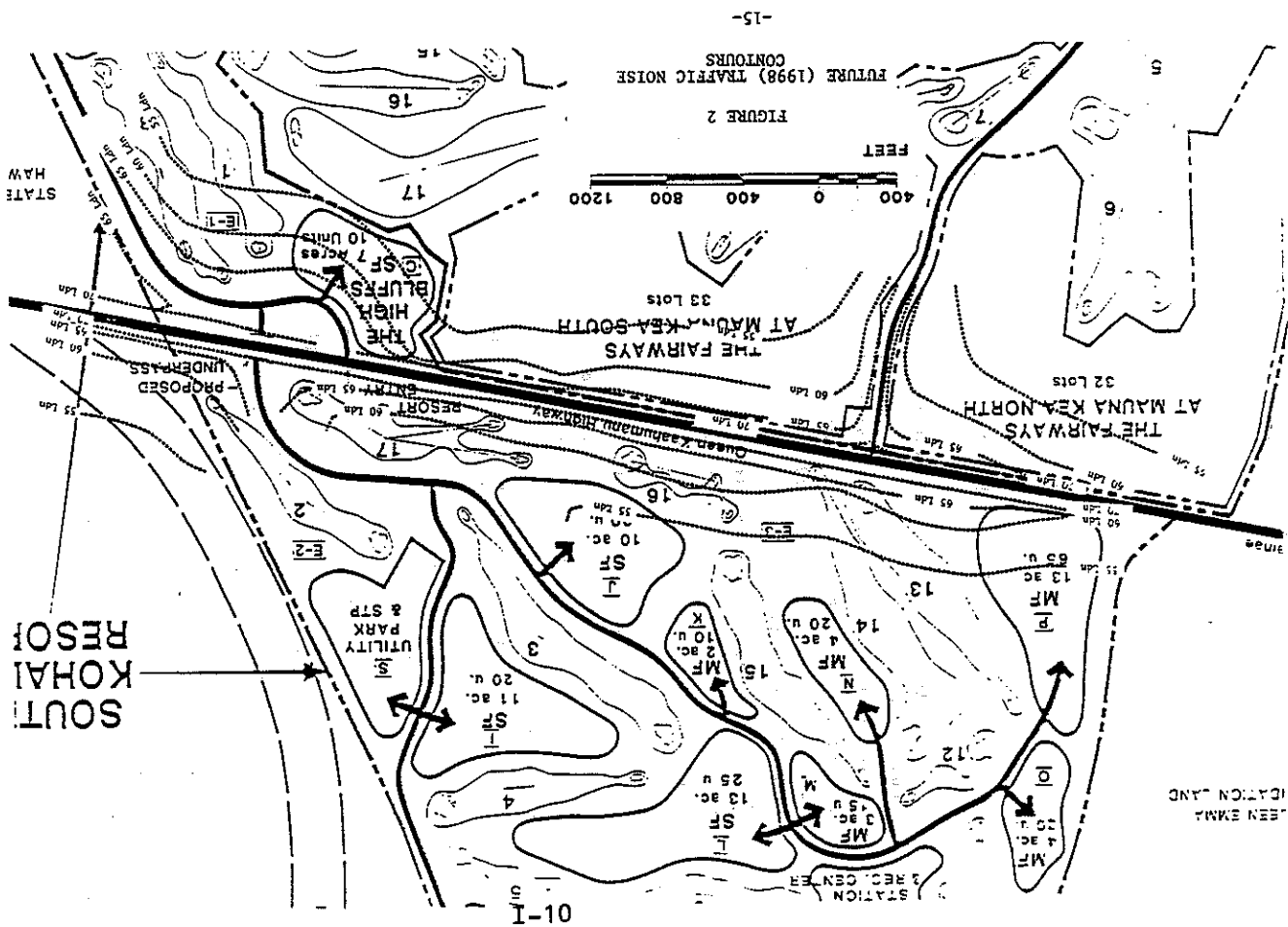
TABLE 6

COMPARISON OF 1995 AND 1998 TRAFFIC VOLUMES AND NOISE LEVELS

| ROADWAY                          | LOCATION                                                              | --- DAILY TRAFFIC VOLUME / Ldn ---<br>1995 | 1998              | INCREASE FROM<br>1995 TO 1998 |
|----------------------------------|-----------------------------------------------------------------------|--------------------------------------------|-------------------|-------------------------------|
| Q. Kaahumanu Highway             | South of Kawaihae Road intersection (Station 11E, 4 & 8).             | 7,693 VPD/70 Ldn                           | 23,420 VPD/72 Ldn | +2 Ldn                        |
| Q. Kaahumanu Highway             | Between Mauna Kea Beach Hotel and South Kohala Resort Entrance Roads. | 7,693 VPD/70 Ldn                           | 23,110 VPD/72 Ldn | +2 Ldn                        |
| Q. Kaahumanu Highway             | South of proposed South Kohala Resort Entrance Road Intersection.     | 7,693 VPD/70 Ldn                           | 20,910 VPD/72 Ldn | +2 Ldn                        |
| South Kohala Resort Entrance Rd. | At Queen Kaahumanu Hwy. Intersection.                                 | 5,522 VPD/65 Ldn                           | 9,410 VPD/67 Ldn  | +2 Ldn                        |

- Notes: 1. Noise levels applicable at 50 FT from roadways' centerlines, and for 180 degree field-of-view.
2. Refer to TABLE 5 for traffic noise modeling assumptions.

are not significantly altered. Because of the predicted 5 Ldn increase in traffic noise from 1984 to 1998 (2 Ldn from 1984 to 1987, plus 3 Ldn from 1987 to 1998), the original noise contours of FIGURE 3 (see APPENDIX C) were used to depict the future traffic noise at The Fairways at Mauna Kea North and South, after first increasing the original contour values by 5 Ldn units. For the area near the proposed South Kohala Resort Entrance Road, the future traffic noise contours were developed by interpolating between the 1995 contour lines of the original FIGURE 4 (see APPENDIX C).



## VI. PROBABLE NOISE IMPACTS AND POSSIBLE MITIGATION MEASURES

A. Traffic Noise: After increasing the traffic noise contour values of FIGURE 3 by 5 Ldn, it can be concluded that two existing homes (within The Fairways at Mauna Kea South) will experience traffic noise levels above 55 Ldn but below 65 Ldn. Their noise exposure class will change from "Minimal" to "Moderate Exposure" (see TABLE 1). Otherwise, other existing homes shown in FIGURE 3 are expected to remain in the "Minimal Exposure" noise category. It is not known whether new homes of The Fairways at Mauna Kea South have been constructed within the traffic noise contours since 1984.

The future High Bluffs development is predicted to be in the "Moderate" to "Significant Exposure" categories, with portions of the development within the "Significant Exposure" category. This expected situation is due to future traffic on Queen Kaahumanu Highway as well as projected traffic on the proposed South Kohala Resort Entrance Road.

On the mauka side of the highway, the planned golf course will be an adequate noise buffer for the majority of the planned noise sensitive uses on that side of the highway. Most of the residential lots should not be exposed to 65 Ldn noise contribution from the highway. The possible exception is the proposed multifamily development at Parcel "P"--portions of which are predicted to be exposed to levels between 60 and 65 Ldn.

At distances exceeding 1,000 FT mauka or makai of Queen Kaahumanu Highway, noise levels within the proposed resort complexes will be controlled by local traffic on the circulation roadways. At 35 MPH roadway speeds, setback distances of approximately 50 FT, 100 FT, and 250 FT are required to achieve 55 Ldn or less for roadway volumes of 300, 1,000, and 3,000 VPD respectively.

Traffic noise mitigation measures should be considered for reducing traffic noise at the proposed High Bluffs and Parcel "P" residential lots to at least 60 Ldn, or preferably, to 55 Ldn.

The use of walls or berms to shield the lots from highway and entrance road noise should be considered. Orientation of living and bedroom unit windows toward the direction opposite of living traffic sources should also be considered. If berm or wall construction is not feasible, other options such as alternate siting, sound attenuation treatment of ventilation openings, or air conditioning should be considered.

Although 1987 traffic noise at two existing homes at The Fairways at Mauna Kea South are predicted to increase by 3 Ldn units to values greater than 55 Ldn, their noise exposure category will be "Moderate." Also, because of a possible 5 Ldn unit bias toward higher-than-actual values, it is recommended that no mitigation measures be considered at this time.

B. Noise Impacts from Hotel Equipment: Typical ambient noise levels near shoreline areas are in the order of 50 to 65 dBA, depending on wave conditions and receptor distance from the shoreline. Concerns were expressed regarding the potential intrusion of the natural background noise levels at Hapuna Beach by fixed mechanical equipment and mobile maintenance equipment operations at the proposed Beach Hotel. Typical levels of these mechanical equipment are generally in the order of 65 to 75 dBA at 50 FT, particularly if the equipment is powered by an engine. The louder equipment may be audible when used within 100 FT of the beach area, particularly during days with little or no surf motion.

The preservation of the natural acoustical environment at Hapuna Beach is a desirable long term goal. It is not necessary to limit intrusive noise to levels as low as 25 dBA, since existing background noise levels are probably higher at 50 to 65 dBA on the beach. Typical setback distances from the hotel to the shoreline are estimated to be in the order of 200 FT or more, which should decrease the risks of excessive noise levels propagating from the hotel onto the beach areas. If necessary, fixed mechanical equipment which emit audible noise can be muffled or shielded from the beach by terrain features or man-made structures

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dBA at 50 FT distance), and due to the exterior nature of the work (grading and earth moving, trenching, concrete pouring, etc.). The use of properly muffled construction equipment should be required on the job site. State Department of Health construction noise regulations, curfews, and permit procedures have been successfully applied in order to minimize construction noise impacts. The early phasing of the construction of landscaped buffer/biems between noise sensitive receptors and the job sites of later phases of construction is another possible noise mitigation measure. These mitigation methods are generally adequate for minimizing the short term impacts resulting from construction noise.

which can serve as noise barriers. Noise impacts from mobile or portable ground maintenance equipment may be minimized by the use of landscaping which are designed to require minimal usage of powered equipment, by scheduling of maintenance operations during low beach occupancy periods, or by the installation of electrical outlets so that electric equipment may be substituted for engine powered equipment.

C. Noise Impacts from Helicopters: Concerns were expressed regarding helicopter noise impacts during direct overflights or flybys at short distances from residential and beach areas. Because tour helicopter facilities (landing pad, parking lot, etc.), are not planned within the South Kohala Resort, helicopter noise impacts would not normally be associated with the project. The practice of overflying the Mauna Kea Beach Resort area by tour helicopters (without landing) is a potential cause of concern to the South Kohala Resort because of the low background ambient noise of the area (40 to 50 dBA), and the desire to present visitors and residents with the natural acoustic environment. For these reasons, noise impacts from helicopters are not expected to be the direct result of the South Kohala Resort facilities or operations.

D. Short Term Construction Noise Impacts: Audible construction noise may be unavoidable due to the proximity of the project to the developed areas of Mauna Kea Resort and to the Hapuna Beach Park. Depending on the type of construction activity, distances at which outdoor construction noise are predicted to be audible range from 500 to 2,000 FT. The more intense (90 to 70 dBA) noise levels, however, are expected to be limited to receptor distances of 50 to 500 FT. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the surrounding area.





A. REFERENCES

- (1) "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise; June 1980.
- (2) American National Standard, "Sound Level Descriptors for Determination of Compatible Land Use;" ANSI S3.23-1980; Acoustical Society of America.
- (3) Darby-Ebisu & Associates, Inc.; "Traffic Noise Impacts Resulting From the Proposed Stone Bluffs Development at Mauna Kea Beach and From the Proposed Hapuna Beach Resort;" May 30, 1984.
- (4) Barry, T. and J. Reagan; "FHWA Highway Traffic Noise Prediction Model;" FHWA-RD-77-108; Federal Highway Administration; Washington, D.C.; December 1978.
- (5) Transmittal from Belt, Collins & Associates to Y. Ebisu & Associates; 24 Hour Traffic -- Queen Kaahumanu Highway; June 17, 1987.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor-Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E, ...). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the L<sub>eqdn</sub> with the L<sub>A</sub>dn.

Although not included in the tables, it is also recommended that "L<sub>EPN</sub>" and "L<sub>EPN</sub>" be used as symbols for perceived noise levels and effective perceived noise level, respectively. It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows: The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the

term "equivalent". Hence, Leg is designated the "equivalent sound level". For L<sub>g</sub>, L<sub>p</sub>, and L<sub>q</sub>, "equivalent" might not be stated since the concept of dB<sub>r</sub>, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important. "Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristic of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, dBA, dB(A), and dBA<sub>EPN</sub> are not to be used. Examples of this preferred usage are: the Perceived Noise Level (L<sub>PN</sub>) was found to be 75 dB. L<sub>PN</sub> = 75 dB. This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighted Loss of Hearing" (PHL) shall be used consistent with CHMRA Working Group 09 Report Guidelines for Preparing Environmental Impact Statements (1977).

TABLE I: A-Weighted Recommended Descriptor List

| Term                                    | Symbol             |
|-----------------------------------------|--------------------|
| 1. A-Weighted Sound Level               | L <sub>A</sub>     |
| 2. A-Weighted Sound Power Level         | L <sub>WA</sub>    |
| 3. Maximum A-Weighted Sound Level       | L <sub>max</sub>   |
| 4. Peak A-Weighted Sound Level          | L <sub>Apk</sub>   |
| 5. Level Exceeded x% of the time        | L <sub>x</sub>     |
| 6. Equivalent Sound Level               | L <sub>eq</sub>    |
| 7. Equivalent Sound Level over Time (T) | L <sub>eq(T)</sub> |
| 8. Day Sound Level                      | L <sub>d</sub>     |
| 9. Night Sound Level                    | L <sub>n</sub>     |
| 10. Day-Night Sound Level               | L <sub>dn</sub>    |
| 11. Yearly Day-Night Sound Level        | L <sub>dn(y)</sub> |
| 12. Sound Exposure Level                | L <sub>SE</sub>    |

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is L<sub>eq(1)</sub>). Time may be specified in non-quantitative terms (e.g., could be specified as L<sub>eq(MSD)</sub> to mean the weighting cycle meter for a washing machine)

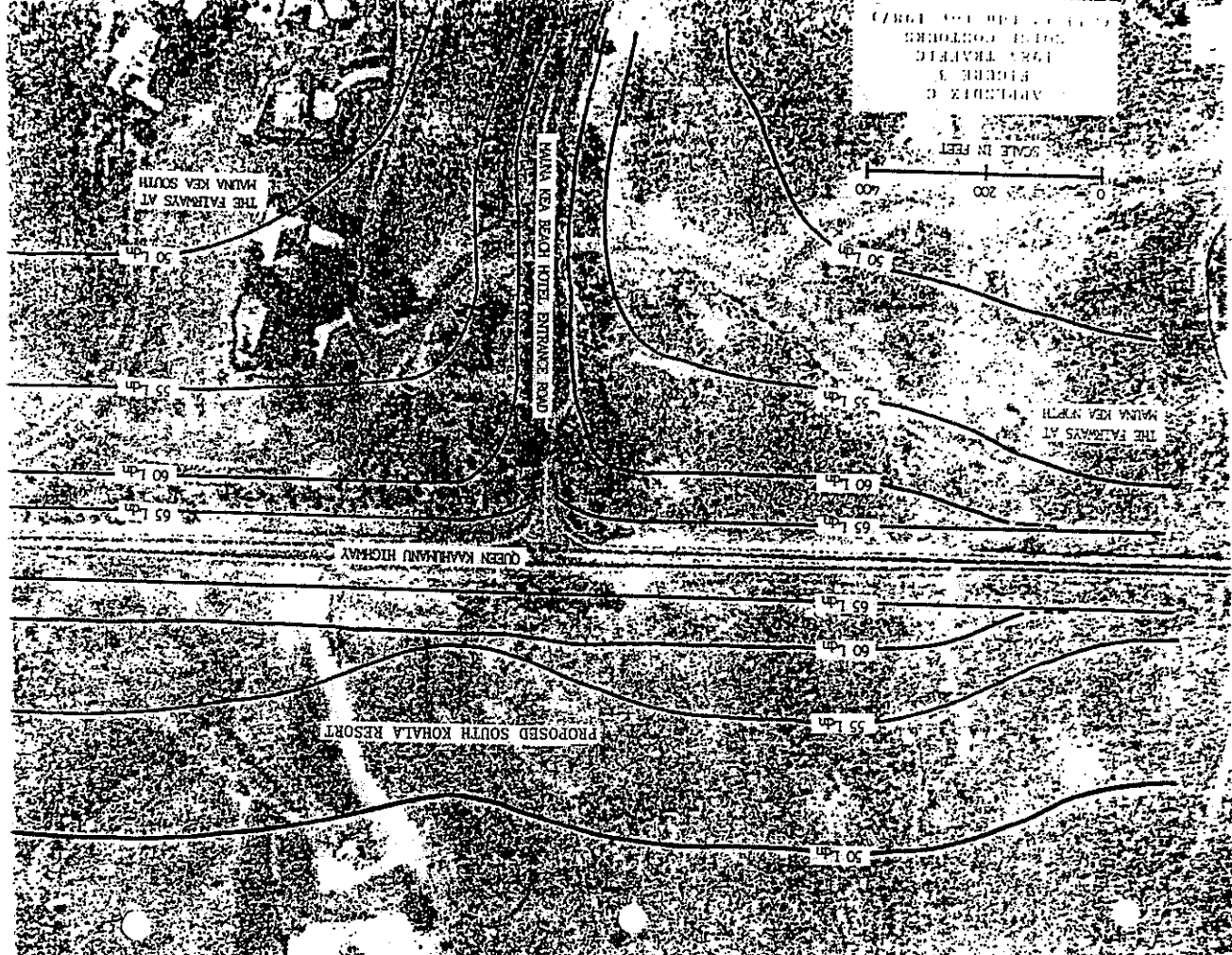
TEXT

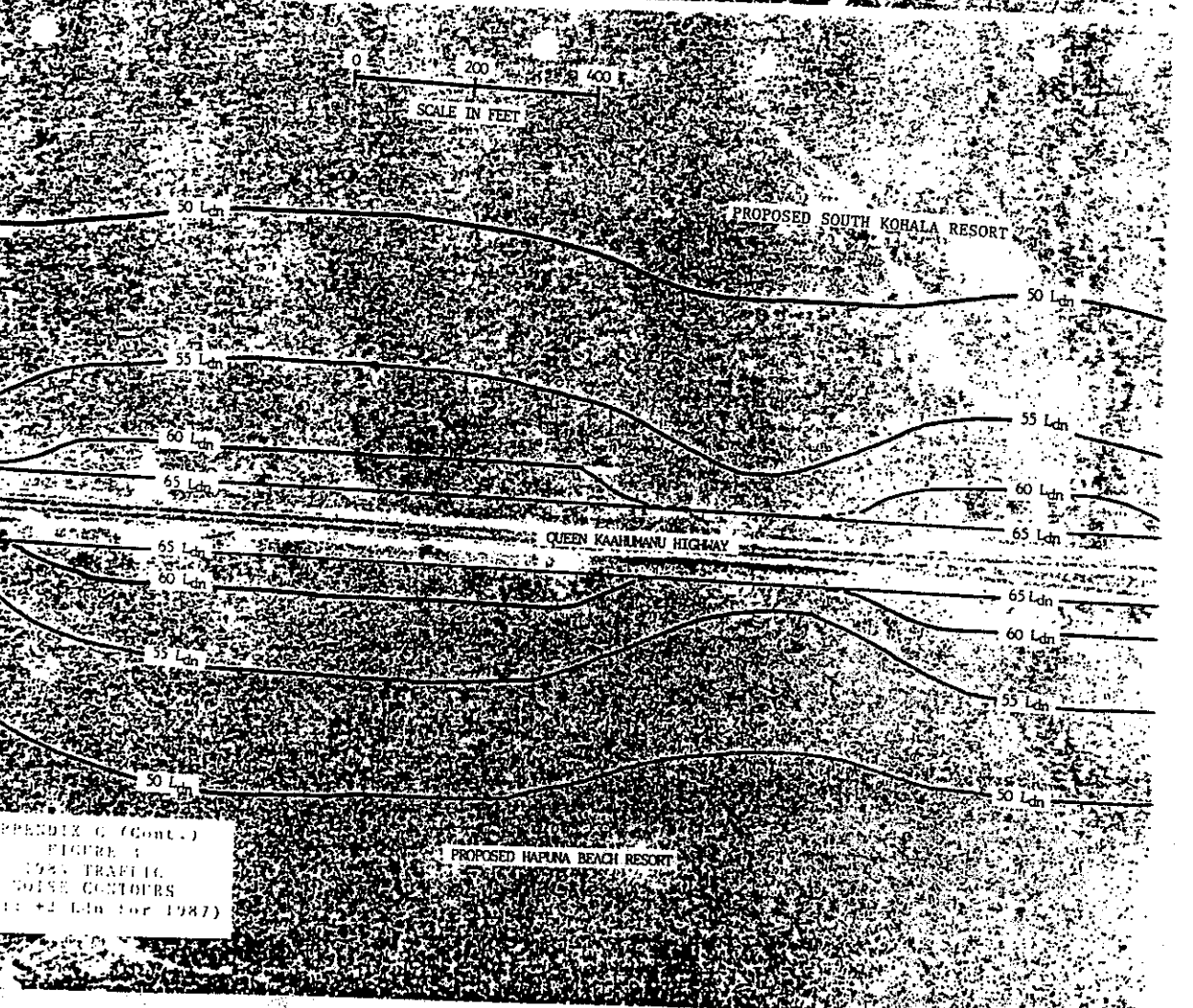
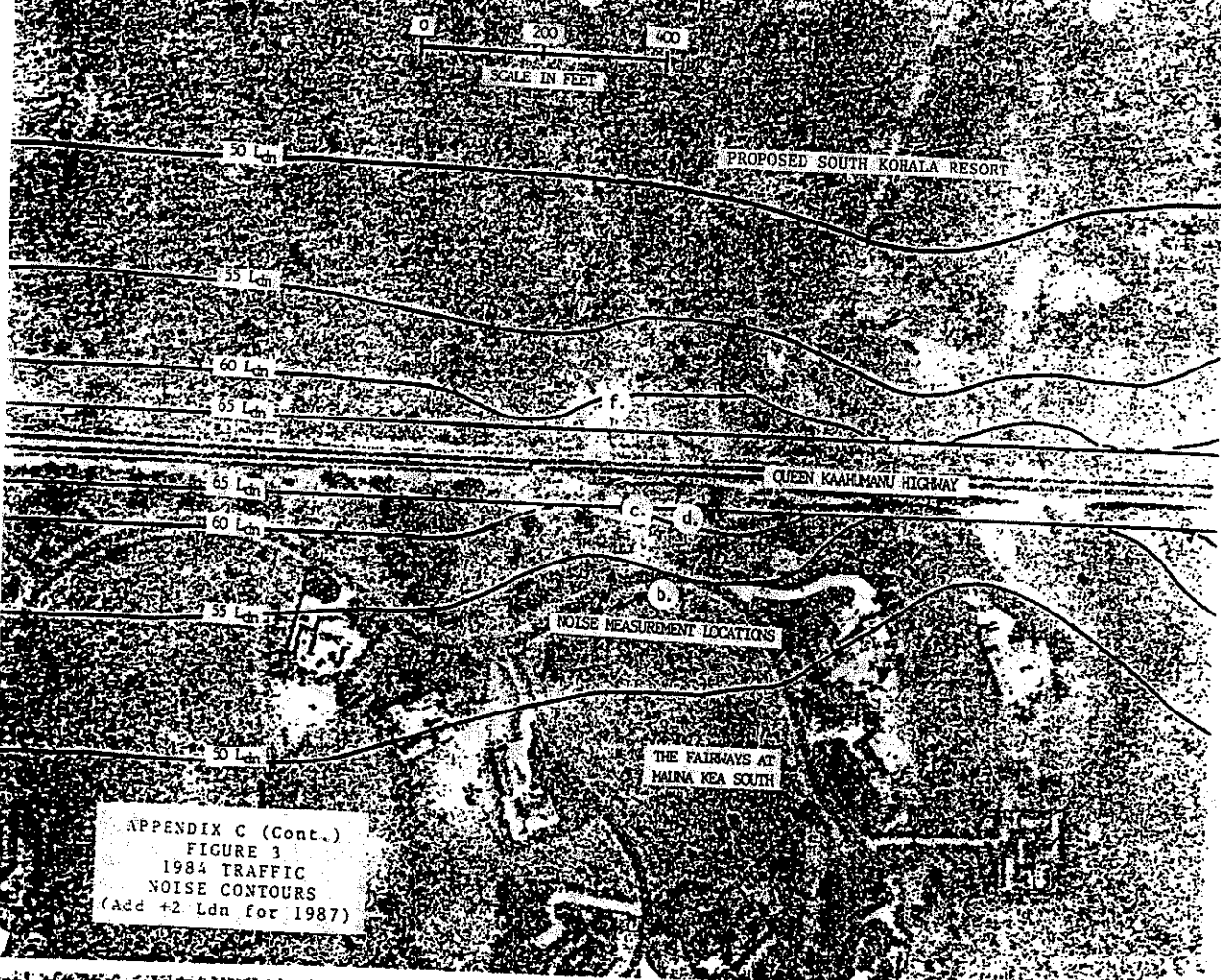
APPENDIX B (CONTINUED)

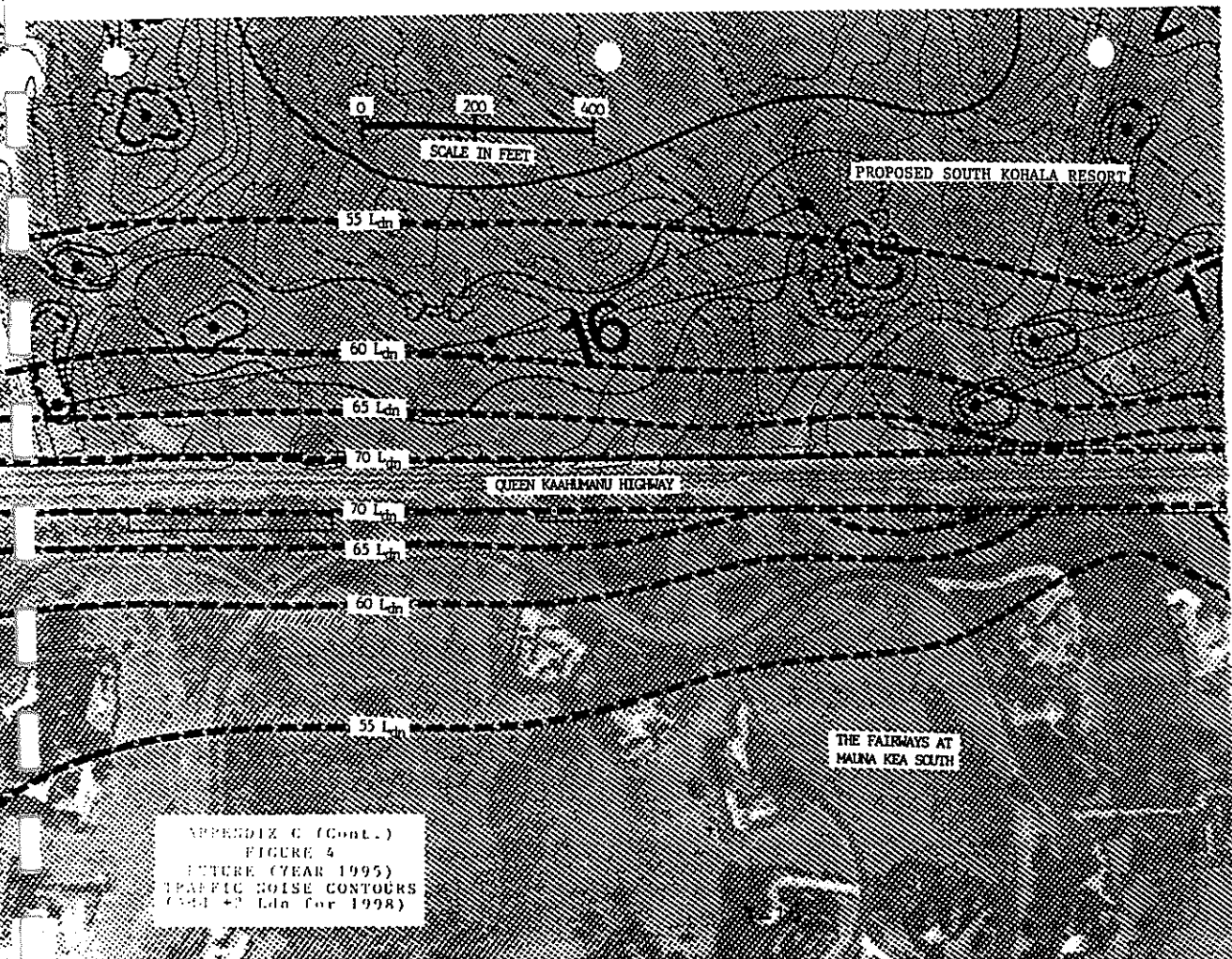
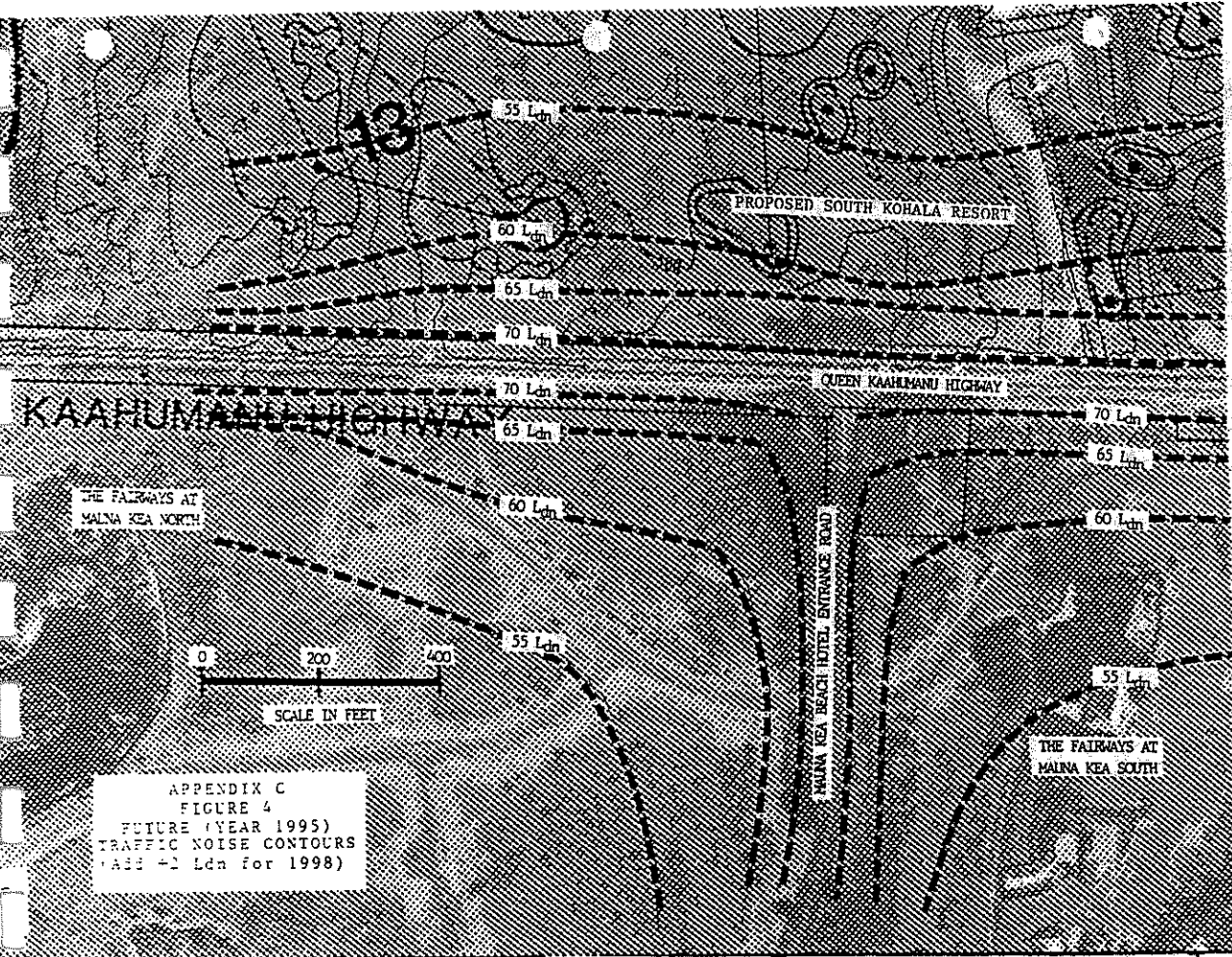
TABLE 11: Recommended Descriptor List

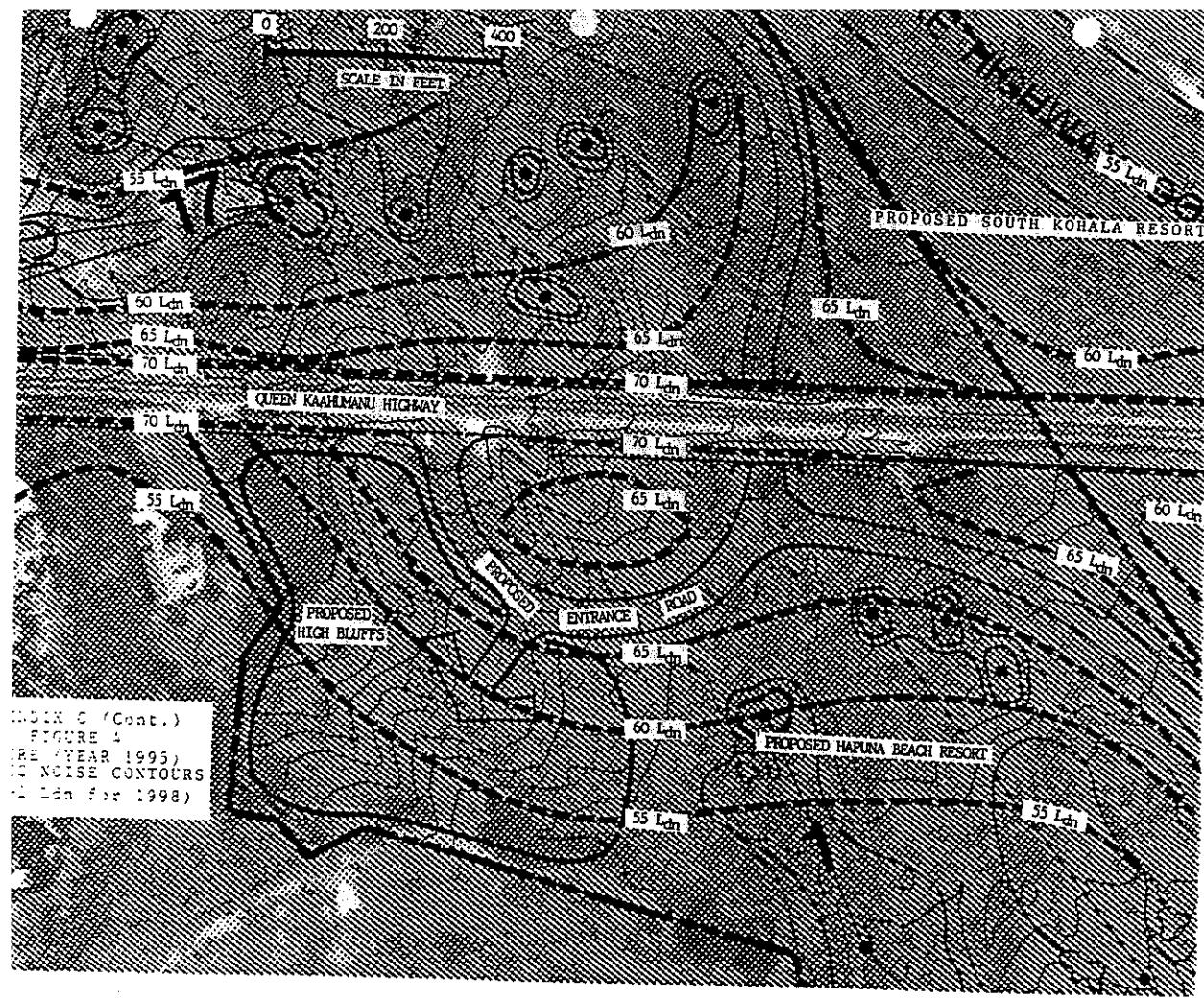
| TERM                                                                        | ALTERNATIVE (1) |              | OTHER WEIGHTING |              | (2)          |
|-----------------------------------------------------------------------------|-----------------|--------------|-----------------|--------------|--------------|
|                                                                             | A-WEIGHTING     | A-WEIGHTING  | OTHER WEIGHTING | UNWEIGHTED   |              |
| 1. Sound (Pressure) Level                                                   | $L_p$           | $L_{pA}$     | $L_p$           | $L_{pB}$     | $L_p$        |
| 2. Sound Power Level                                                        | $L_W$           | $L_{WA}$     | $L_W$           | $L_{WB}$     | $L_W$        |
| 3. Max. Sound Level                                                         | $L_{max}$       | $L_{max}$    | $L_{max}$       | $L_{max}$    | $L_{pmax}$   |
| 4. Peak Sound (Pressure) Level                                              | $L_{pk}$        | $L_{pk}$     | $L_{pk}$        | $L_{pk}$     | $L_{pk}$     |
| 5. Level Exceeded $x\%$ of the time                                         | $L_x$           | $L_x$        | $L_x$           | $L_x$        | $L_{px}$     |
| 6. Equivalent Sound Level                                                   | $L_{eq}$        | $L_{eq}$     | $L_{eq}$        | $L_{eq}$     | $L_{peq}$    |
| 7. Equivalent Sound Level Over Time (T)                                     | $L_{eq}(T)$     | $L_{eq}(T)$  | $L_{eq}(T)$     | $L_{eq}(T)$  | $L_{peq}(T)$ |
| 8. Day Sound Level                                                          | $L_d$           | $L_{Ad}$     | $L_d$           | $L_{dA}$     | $L_{pd}$     |
| 9. Night Sound Level                                                        | $L_n$           | $L_{An}$     | $L_n$           | $L_{nA}$     | $L_{pn}$     |
| 10. Day-Night Sound Level                                                   | $L_{dn}$        | $L_{Adn}$    | $L_{dn}$        | $L_{dnA}$    | $L_{pdn}$    |
| 11. Yearly Day-Night Sound Level                                            | $L_{dn}(y)$     | $L_{Adn}(y)$ | $L_{dn}(y)$     | $L_{dnA}(y)$ | $L_{pdn}(y)$ |
| 12. Sound Exposure Level                                                    | $L_S$           | $L_{SA}$     | $L_S$           | $L_{SA}$     | $L_{Sp}$     |
| 13. Energy Average value over (non-time domain) set of observations         | $L_{eq}(e)$     | $L_{Aeq}(e)$ | $L_{eq}(e)$     | $L_{Aeq}(e)$ | $L_{peq}(e)$ |
| 14. Level exceeded $x\%$ of the total set of (non-time domain) observations | $L_x(e)$        | $L_{Ax}(e)$  | $L_x(e)$        | $L_{Ax}(e)$  | $L_{px}(e)$  |
| 15. Average $L_x$ value                                                     | $L_x$           | $L_{Ax}$     | $L_x$           | $L_{Ax}$     | $L_{px}$     |

(1) "Alternative" symbols may be used to assure clarity or consistency.  
 (2) Only B-weighting shown. Applies also to C, D, E, etc., weighting.  
 (3) The term "pressure" is used only for the unweighted level.  
 (4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is  $L_{eq}(1)$ ). Time may be specified in non-quantitative terms (e.g., could be specified as  $L_{eq}(WASH)$  to mean the washing cycle noise for a washing machine).









NOISE G (Cont.)  
 FIGURE 1  
 YEAR 1995  
 NOISE CONTOURS  
 Ldn for 1998

APPENDIX J

REVENUE-COST AND ECONOMIC IMPACT ANALYSIS OF THE  
PROPOSED SOUTH KOHALA RESORT HOTEL

DESCRIPTION OF PROJECT

The proposed South Kohala Resort Hotel is located south of the Westin Mauna Kea Beach Hotel, on the island of Hawaii. The project is being envisioned as a self-contained, full-amenity resort containing a 350-unit luxury-class hotel, tennis complex and an 18-hole championship golf course.

Also planned to the northern portion of the subject property will be multi-family and single family residential units, unimproved lots and house and lot packages. These facilities are expected to provide housing for permanent residents and second home owners, and accommodations for transient guests. In addition, there will be a beach club adjacent to the proposed hotel and a recreation community center in the mauka lands.

REVENUE-COST AND ECONOMIC IMPACT ANALYSIS OF THE  
PROPOSED SOUTH KOHALA RESORT

PUBLIC REVENUE-COST ANALYSIS

Introduction

Any economic activity results in certain gains and losses to the economy. In particular, an economic activity provides the public sector with additional sources of revenues and simultaneously, increases the burden on the available public resources. In order to assess the impact of this project, an estimate of the incremental revenues and costs was made, and fully charged to the project in order to calculate the revenue-cost ratio.

The approach employed in conducting the revenue-cost analysis included:

- (1) Identification of the kinds of revenue and cost elements to consider;
- (2) Estimation of the dollar amount that should be associated with each revenue and cost element; and
- (3) Comparison of the discounted present values of the various revenue and cost totals.

The objective of this analysis was to determine whether the additional government revenues generated as a result of the project would be sufficient to offset the additional costs incurred.

PREPARED BY  
ENVIRONMENT CAPITAL MANAGERS, INC.

September 1987

#### Study Parameters

##### Study Time Period

Based upon the schedule provided by Belt Collins & Associates for the South Kohala development, the start year of the project will be 1991 and the end year will be 2006. For purposes of this study, the base period was set at 1987, to maintain comparability with any other base studies.

##### Discount Rate

A 10% discount rate was selected to convert all the revenue and cost flows estimated to occur during this study period into a common value. This rate represents the estimated average rate of return for private investments before taxes and after inflation, as prescribed by the U.S. Office of Management and Budget, under Circular No. A-94, dated March 27, 1972.

##### Time Schedule

The timing of the various flows of revenue and costs were based upon information provided by Belt Collins & Associates. It was assumed that the construction would begin in 1991, and that operations would commence in the year 1993.

For purposes of cash flow timing, multi-year activities, such as the hotel construction, were averaged among those years, unless otherwise specified by the project's development schedule.

##### Operational Employment

The direct employment created by the operation of these additional rooms was estimated by Community Resources, Inc. These estimates were adopted in this study. It was assumed that all positions would be in-place at the end of the construction period.

#### Revenue and Cost Variable Selection and Estimation

For purposes of this study, those financial impacts likely to occur as a result of this project were considered to be relevant variables. Of these, only those likely to produce a significant impact on public sector revenues and costs were estimated in this study.

Determination of which revenues and costs to consider was

made after examination of the financial reports and other data sources of the State of Hawaii and the County of Hawaii. Each category listed was considered to determine whether or not a significant change was likely to occur as a direct result of the project, all other things being equal. Since the activities in the South Kohala project would be new or additional to activities already taking place in the State of Hawaii and the County of Hawaii, if it was determined that a change was likely to occur and likely to produce a significant impact, its incremental amount was then estimated and fully charged to the project in order to calculate the revenue-cost ratio.

The values attached to each of the variables were calculated in a manner closely approximating the actual valuation approach. The actual application of these calculations can really only be determined on a case by case basis, under actual operating conditions. Because of this, certain assumptions had to be made for this analysis on a generalized basis. This was done after consultation with the respective agencies.

#### Present Value Estimation Procedure

Public revenue and cost estimates for each of the study variables were distributed over time according to the development schedule presented above. Each of these variables were estimated in constant 1987 dollars.

In order to evaluate the "flow" of dollars over time, a method of "compressing" or "reducing" these numbers was needed. Additionally, even without inflation, a dollar 10 years from now will not be worth the same as today. To account for this "time value of money", as well as to "compress" the flow of dollars, "discounting" must be used.

To accomplish this, a standard discounting technique, known as present value analysis, was used. Basically, the value at some time period in the future is "brought back" to a base period. In this case, 1987, by use of a "present worth factor". This can be represented mathematically as follows:

$$V_0 = V_t(1+r)^{-t}$$

where

$V_0$  = value of the variable at time 0 (base year)

$V_t$  = value of the variable at time t

r = discount rate (time value of money)

t = time (year)

Once all of these calculations are completed for each variable, the results for each variable are summed to represent

the cumulative effects of the project over time.

The revenue variables are added together as well as the cost variables. Then, the ratio of the total revenues to the total costs is calculated. This ratio is referred to as the "Revenue--Cost Ratio". This ratio of revenues to costs provides a relative measure of the dominance of either revenues or costs to the expected net effect of the project in total. A revenue-cost ratio of 2.0 to 1.0, for example, would imply that for every \$2.00 in public revenues generated by the project, there will be an additional public cost of \$1.00. A revenue-cost of 0.5 to 1.0, on the other hand, would imply that only 50¢ would be gained through public revenues for every dollar of public costs incurred. A ratio of 1.0 to 1.0 would indicate unity or a "breakeven" situation.

In its civil projects, the U.S. Army Corps of Engineers recommends proceeding with a project if there is unity or greater in the calculated revenue-cost ratio.

#### Study Variables

This section details the variables which this study assessed in detail which would produce financial impacts on public sector revenues and costs. Each of the revenue and cost variables are discussed as to the nature of the variable, the rationale for its inclusion or exclusion, estimation procedure and critical assumptions that were made.

#### Public Revenue Variables

General Excise/Development. This variable was included to reflect the revenue generation that would occur as a result of the development activities. The legal basis is derived from the Hawaii Revised Statutes, Chapter 237. Under HRS 237-13(3)(B), an outside contractor would be levied a 4% general excise tax. Should the developer wish to self-contract, the same 4% general excise tax assessment would be made under HRS 237-13(3)(D).

Development cost estimates were provided by Belt Collins and Associates. It was estimated that the total development would cost approximately \$328.5 million in 1987 dollars. This figure includes both infrastructure and construction activities.

General Excise/Operations. The rental income derived from the operations of the hotel and transient-use condominiums would be assessed general excise taxes under the Hawaii Revised Statutes, Chapter 237. The following assumption was made for this variable: all rental activity would be assessed the 4% tax.

General Excise/Personal Consumption. A portion of the wages earned would be spent on various goods and services. This variable was estimated to reflect these expenditures and their addition to the State's general revenue fund.

It was further assumed that the average employee would spend 60 percent of their gross income on consumable goods and services.

Corporate Income Tax/Development. The net taxable income derived by the development of the project would be subject to the corporate income tax under the Hawaii Revised Statutes, Chapter 235. Under the recently adopted Act 239, SLH 1987, Section 235-71 of Hawaii Revised Statutes was amended to provide a new rate structure. This structure was used in the study. Section 235-71 contains the following rate structure:

4.4% on the first \$25,000 of taxable income  
5.4% on the next \$75,000 of taxable income  
6.4% on all income over \$100,000.

It was assumed that 10% of the estimated income generated by this project would be subject to the corporate income tax.

Corporate Income Tax/Operations. The net taxable income derived from the hotel's operations would be subject to the corporate income tax under the Hawaii Revised Statutes, Chapter 235. The newly adopted rate structure was also used here to estimate the potential income tax revenue to be generated.

Based on Westin Mauna Kea's information, a composite profit margin was used to estimate the taxable income that would be subject to the corporate income tax.

Personal Income Tax. It was assumed that each employee represented individual households and that each was the sole wage-earner for that household. The average income used was based on information provided through Belt Collins by Community Resources, Inc.

The estimated taxable income was based on Act 239, SLH 1987 rates and standard deduction provisions. It was assumed that each household would claim an average of three exemptions and claim the standard deduction rather than itemize.

Real Property Tax. The reclassification and rebasing of the property would increase the relative value of the land. In addition, the improvements would also have value.



grounds that the "guests" at the hotel and condominiums may also require these services.

Estimates provided by Belt Collins & Associates indicated that the improvements would total \$328.5 million.

Using the 1987 assessed value of the land areas as the basis for estimating land value changes, the analysis utilized land values ranging from \$7,500 per acre for class 8 (unimproved residential) parcels to a high of \$479,169 per acre for class 1 (improved residential) parcels. The net change from the existing class was estimated and included in the analysis.

The land portion was taxed at the rate of \$10.00 per \$1,000 of assessed value. The improvements were taxed at \$8.50 per \$1,000 of assessed value.

Hotel Room Tax. Effective January 1, 1987, hotel room rentals are subject to a 5 percent hotel room tax. This source of revenue was incorporated into the analysis. The basic assumptions included a 70 percent occupancy rate and an average room rate of \$200 per night.

#### Public Cost Variables

Lower Education. The increase in employment population may increase public education costs if additional teachers, supplies, etc. are needed beyond the level currently being planned. Whether the incremental cost will rise proportionately with the additional population, is uncertain. If the majority of the direct labor required could be adequately absorbed through the local labor supply, then under such a scenario, it is expected that the actual cost increase realized will be much smaller. This is due to a premise that existing households would not necessarily move to a new area, but would commute to the new workplace. Therefore, total marginal increase in costs would be minimized. However, with in-migration of the labor force required to staff the operations a reasonable possibility, an average cost allocation to the project was made.

Higher Education. The increase in the number of additional households in the area will probably increase the demands on the higher education services. Although there is no concrete evidence to indicate the proper amount to be charged to the project, the average costs for the major elements for the Hilo Campus of the University of Hawaii, were charged to the project.

Health Services. This variable included the emergency medical service and the Honokaa, Kohala and Kona Hospital components.

The average cost was estimated to be \$104 per person, on the basis of the de facto population. This base was selected on the

Mass Transit Services. Although the resort guests and occupants will most likely rent or will own an automobile, the employees could conceivably use the mass transit services for commuting. However, since there is no basis for assuming a ratio of use, the average cost of this variable will be shared by the addition to the de facto population level.

The average variable cost per (de facto) person was estimated to be approximately \$5.

Police Services. Although the project site will probably contract or employ its own security, the employment created through the project, will potentially add to the workload for police services within the residential community. Therefore, the variable was included.

It was estimated that the average variable cost per person was \$101. This amount was assessed to the aggregate employee-household.

Fire Services. The employee's homes may require the services of the Fire Department. Thus, this variable was included. It was estimated that the average variable cost per person would be \$56.

#### Excluded Variables

Certain variables, such as highway construction & maintenance, airport expansion and utilities, were excluded from this analysis. Although these variables might be affected by the project, they are funded through user fees which are kept solvent. This also includes capital improvement projects, which are funded directly through bond issues, the costs are paid through these special fund. Therefore, the inclusion of these costs, along with the assessed user fees would result in a "wash".

#### Results of the Present Value Analysis

The revenue-cost analysis identified the kinds of revenue and cost elements, estimated the dollars associated with each revenue and cost element, and compared the discounted present value of the various revenue and cost totals.

For the South Kohala project, a revenue-cost ratio of 4.3 to 1.0 was attained. This indicates that an additional \$1.00 in public revenue benefits would accrue to the State of Hawaii and/or

the County of Hawaii for every dollar of public cost caused by the proposed development. This would be a definite financial gain to the State and to the County of Hawaii, should this project be implemented. As a standard for comparison, in its civil projects, the U.S. Army Corps of Engineers recommends proceeding with a project if there is unity (1.0 to 1.0) or greater. The summary of the itemized results of the present value analysis is presented in the table below:

|                       |              |
|-----------------------|--------------|
| General Excise        |              |
| Development           | \$ 6,406,828 |
| Operations            | 11,518,034   |
| Personal Consumption  | 864,506      |
| Corporate Income Tax  |              |
| Development           | 1,025,475    |
| Operations            | 5,529,042    |
| Personal Income Tax   | 832,812      |
| Real Property Tax     | 12,046,241   |
| Hotel Room Tax        | 3,440,963    |
|                       | -----        |
| PUBLIC REVENUES       | \$41,663,900 |
|                       |              |
| Education             |              |
| Lower                 | \$ 1,557,287 |
| Higher                | 1,026,908    |
| Health Services       | 731,861      |
| Mass Transit Services | 36,965       |
| Police Services       | 714,266      |
| Fire Services         | 396,758      |
|                       | -----        |
| PUBLIC COSTS          | \$ 4,464,044 |
|                       |              |
| REVENUE-COST RATIO    | 9.3 to 1.0   |

The cumulative discounted public revenues totalled \$41.7 million in constant 1987 dollars. Of these variables, the combined "general excise tax" variable contributed over \$18.8 million dollars. This was followed by the "real property tax" variable.

The cumulative discounted public costs totalled \$4.5 million in constant 1987 dollars. Over \$1.5 million was accounted for by the "lower education" variable, followed by "higher education", contributing \$1.0 million.

## IMPACT ANALYSIS

### Introduction

As with any economic activity, the injection of dollars into the economy will result in direct impacts through the purchases of various goods and services from the other industries. The additional purchases made will, in turn, cause these industries to purchase more goods and services from other industries. The result is a chain reaction of purchases, or a "multiplier" effect produced by the original increase in purchases.

### The Basic Theory

The simplest way to understand the multiplier effect is to consider what would happen if you were given a "brand new dollar". It is likely that you would spend part of it and save the rest. Let's say you spent \$.80 of that dollar. For simplicity, assume that individuals and businesses were equal entities in their economic behavior. This \$.80 then, was again partially spent with the remainder saved. If this ratio was assumed to remain constant, then \$.64 would be spent and the remaining \$.16 saved, and so on. If this process were to continue until all the money was either spent or saved in this proportion, the "injection" of this additional dollar would ultimately yield \$.50 in output for our simple economy. In other words, a multiplier effect of 5 had occurred. In essence, then, not only the direct effect of the additional dollar "injected" must be analyzed, but also the indirect effects.

### Hawaii's Input-Output Model

In 1972, the Department of Planning and Economic Development (DPED) published the State's updated Input-Output Model. This model summarized the economic activities of the State at a given moment in time, providing information on the inter-relationships between all sectors within the economy. Its most useful application was the formulation of output, income and employment multipliers. Type I multipliers provided information on the direct-plus-indirect impacts due to changes in final demand. Type II multipliers, on the other hand, described the direct-plus-indirect-plus-induced effects due to a change in final demand. The major assumption made in using these multipliers was that technology and factor prices remained relatively stable.

### Technical Considerations

The direct output dollars were presumed to be primary or "new" due to the following factors:

provide needed complementary services.

#### Analysis of Impacts

The sections below detail the various types of impacts that are expected to occur throughout the economy, as well as the relevant parameters used to calculate them. These results should be viewed as the relative magnitudes that may exist should this project be undertaken. This is due in part to the inherent assumptions built into the input-output model and various estimation errors, such as sampling errors, rounding errors, etc. As such, this is not a prediction. In addition, the effects analyzed in this section were made at the point in time when the project would be in full operation.

Output Effects. The impacts here represents the changes that could occur to the Gross State Product, that is, the effect on the total value of the goods and services produced within the State's economy.

Upon full operation, it was estimated that the 350-room hotel would generate an annual average of \$43.2 million, in constant 1987 dollars. The indirect and induced effects were calculated using the following multipliers for the hotel industry:

|               |       |
|---------------|-------|
| Indirect..... | 0.453 |
| Induced.....  | 0.779 |

Based on these multipliers, the various effects were estimated as follows:

|               |                |
|---------------|----------------|
| Direct.....   | \$43.2 million |
| Indirect..... | 19.6 million   |
| Induced.....  | 34.7 million   |
| TOTAL.....    | \$96.5 million |

Income Effects. This impact represents the income changes that could occur to the household sector of the economy. The various effects were calculated using the following multipliers for the hotel industry:

|               |       |
|---------------|-------|
| Direct.....   | 0.369 |
| Indirect..... | 0.167 |
| Induced.....  | 0.314 |

The income effects were calculated using these multipliers with the estimated direct output estimate of \$43.2 million.

Based on the above, the estimates of the various income effects were as follows:

1. During the development stages, the capital required to fund such a project will more than likely find its sources outside of the Hawaiian economy;
2. The expected operations of this resort development will find its clientele base largely from the westbound tourist traffic and from westcoast buyers.
3. The non-primary dollars that may flow into this project will likely to be small.

The "hotel" industry was selected for use in this analysis. Although it represents a composite of the entire industry, it is assumed to be adequate for this general analysis. The multipliers used in this analysis was based on the 1977 revised coefficients.<sup>1</sup>

#### Detailed Analysis

##### Definitions

There are three effects which are relevant: the direct effects, the indirect effects, and finally, the induced effects. The direct effect is the immediate and primary impact of a given project upon the economy. For this project, an example would be the hotel rental fees charged.

The indirect effect, on the other hand, is the secondary impact that would be felt within the economy. It is useful to think about indirect effects in the following manner: in order for the hotels to provide the various services and amenities to their guests, they must purchase various other goods and services such as water, electricity, transportation, etc. The changes that occur in these "support" industries and the employment it creates is the indirect effect.

Finally, the induced effect is the subsequent rounds of changes in the economy which is "time-compressed" into a single value. The "new" income received by the various households employed by the project will trigger increased spending. These increased purchases will deplete existing inventory, and thus, must be restocked by their various suppliers. This in turn, informs the various producers to increase their production through their own increases in orders. The sectors within the economy affected could include supermarkets, theaters, arcades, etc. Also, the effects would be found in the business sectors, influencing increased purchases of supplies and raw materials to

<sup>1</sup>Department of Planning and Economic Development. Research and Economic Analysis Division. unpublished estimates.

Direct..... \$15.9 million  
 Indirect..... 7.2 million  
 Induced..... 13.6 million  
 TOTAL..... \$36.7 million

ESTIMATE OF TOURIST EXPENDITURES

The following set of assumptions were used to estimate the expenditures that could be attributed to visitors at this project:

Occupancy.....70%  
 Average Party Size.....1.9  
 Average Daily Expenditures  
   Japanese.....\$230  
   Non-Japanese..... 90  
 Visitor Distribution  
   Japanese.....20%  
   Non-Japanese.....80%

Based on these assumptions, the 350-unit project will yield annual expenditures of \$20.1 million, in 1987 dollars.

If some or all of the single family and multi-family dwelling units are used by non-local transient households, i.e., outer island, mainland, Japanese, etc., and if they exhibit similar characteristics as the hotel users, then an additional tourist expenditures would be generated, with an estimated maximum of \$32.1 million.

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APPENDIX K

SUMMARY  
SOUTH KOHALA RESORT TRAFFIC STUDY  
ROADWAY LEVEL OF SERVICE ANALYSIS PM PEAK HOUR  
SCENARIO 1 & 4  
SOUTH KOHALA RESORT + EXISTING TRAFFIC

| ID | DESCRIPTION                                | 1987 |     |     | 1993 |    |     | 1998 |     |    | LOS | D   | E    |
|----|--------------------------------------------|------|-----|-----|------|----|-----|------|-----|----|-----|-----|------|
|    |                                            | LOS  | B   | C   | LOS  | B  | C   | LOS  | B   | C  |     |     |      |
| 1  | AKONI PULE HWY N OF KOHALA RANCH           | NB   | 223 | 223 | 278  | NB | 223 | 223  | 278 | NB | 496 | 591 | 670  |
|    |                                            | SB   | 362 | 362 | 448  | SB | 362 | 362  | 448 | SB | 798 | 946 | 1069 |
| 4  | AKONI PULE HWY S OF KOHALA RANCH           | LOS  | B   | C   | C    | NB | 223 | 278  | 320 | NB | 368 | 459 | 534  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 544 | 680 | 769  |
| 11 | KOHALA MOUNTAIN RD N OF KOHALA RANCH       | LOS  | B   | A   | A    | NB | 109 | 128  | 144 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 134 | 157 | 177  | SB | 134 | 157  | 177 | SB | 560 | 707 | 800  |
| 12 | KOHALA MOUNTAIN RD S OF KOHALA RANCH       | LOS  | B   | A   | A    | NB | 109 | 128  | 144 | NB | 153 | 218 | 267  |
|    |                                            | SB   | 134 | 157 | 177  | SB | 134 | 157  | 177 | SB | 382 | 502 | 570  |
| 13 | AKONI PULE HWY S OF KOHALA ESTATES         | LOS  | B   | C   | C    | NB | 223 | 285  | 323 | NB | 206 | 279 | 336  |
|    |                                            | SB   | 362 | 441 | 505  | SB | 362 | 441  | 505 | SB | 295 | 400 | 456  |
| 14 | WAI MEA-KAWAIHAE RD E OF QUEEN K HWY       | LOS  | C   | C   | C    | EB | 376 | 512  | 584 | EB | 231 | 315 | 380  |
|    |                                            | WB   | 168 | 248 | 309  | WB | 168 | 248  | 309 | WB | 281 | 392 | 448  |
| 15 | WAI MEA-KAWAIHAE RD WEST OF KOHALA MTN RD  | LOS  | B   | C   | C    | EB | 240 | 354  | 406 | EB | 264 | 354 | 424  |
|    |                                            | WB   | 192 | 276 | 341  | WB | 192 | 276  | 341 | WB | 282 | 395 | 451  |
| 17 | WAI MEA-KAWAIHAE RD EAST OF LINDSEY RD     | LOS  | C   | D   | D    | EB | 458 | 584  | 662 | EB | 298 | 445 | 512  |
|    |                                            | WB   | 469 | 584 | 676  | WB | 469 | 584  | 676 | WB | 282 | 399 | 488  |
| 18 | MAMALAHOA HWY NO OF LINDSEY RD             | LOS  | D   | D   | D    | NB | 513 | 633  | 715 | NB | 298 | 445 | 512  |
|    |                                            | SB   | 554 | 671 | 768  | SB | 554 | 671  | 768 | SB | 282 | 399 | 488  |
| 20 | MAMALAHOA HWY SO OF LINDSEY RD             | LOS  | B   | C   | C    | NB | 314 | 374  | 423 | NB | 298 | 445 | 512  |
|    |                                            | SB   | 275 | 330 | 372  | SB | 275 | 330  | 372 | SB | 282 | 399 | 488  |
| 38 | PALANI RD MAUKA OF QUEEN KAAHUMANU HWY     | LOS  | D   | D   | E    | EB | 749 | 885  | 994 | EB | 362 | 492 | 546  |
|    |                                            | WB   | 419 | 497 | 561  | WB | 419 | 497  | 561 | WB | 223 | 390 | 479  |
| 39 | QUEEN KAAHUMANU HWY SO OF PALANI RD        | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 41 | QUEEN KAAHUMANU HWY NO OF PALANI RD        | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 42 | QUEEN KAAHUMANU HWY SO OF PALISADES RD     | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 45 | QUEEN KAAHUMANU HWY SO OF KEAHOLE AIRPORT  | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 48 | QUEEN KAAHUMANU HWY SO OF WAIKOLOA BEACH   | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 51 | QUEEN KAAHUMANU HWY SO OF WAIKOLOA MAUKA   | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 54 | QUEEN KAAHUMANU HWY SO OF MAUNA LANI       | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 57 | QUEEN KAAHUMANU HWY SO OF SO KOHALA RESORT | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 60 | QUEEN KAAHUMANU HWY SO OF MAUNA KEA RESORT | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |
| 63 | QUEEN KAAHUMANU HWY SO OF WAI MEA-KAWAIHAE | LOS  | B   | C   | C    | NB | 275 | 358  | 424 | NB | 275 | 358 | 424  |
|    |                                            | SB   | 362 | 448 | 505  | SB | 362 | 448  | 505 | SB | 560 | 707 | 800  |

SUMMARY  
SOUTH KOHALA RESORT TRAFFIC STUDY  
ROADWAY LEVEL OF SERVICE ANALYSIS PM PEAK HOUR  
SCENARIO 2 & 5  
KOHALA RANCH, RITZ CARLTON, HYATT, HOTEL 'X' + EXISTING  
TRAFFIC W/O SOUTH KOHALA RESORT

1987 1993 1998

| NO | DESCRIPTION                               | 1987 |     |     | 1993 |     |     | 1998 |      |     |     |     |     |
|----|-------------------------------------------|------|-----|-----|------|-----|-----|------|------|-----|-----|-----|-----|
|    |                                           | LOS  | B   | C   | D    | LOS | B   | C    | D    | LOS | B   | C   | D   |
| 1  | AKONI PULE HWY N OF KOHALA RANCH          | NB   | 223 | 360 | 466  | NB  | 223 | 360  | 466  | SB  | 362 | 494 | 642 |
| 4  | AKONI PULE HWY S OF KOHALA RANCH          | LOS  | B   | C   | D    | NB  | 223 | 360  | 466  | SB  | 362 | 494 | 642 |
| 11 | KOHALA MOUNTAIN RD N OF KOHALA RANCH      | LOS  | B   | B   | B    | NB  | 109 | 128  | 144  | SB  | 134 | 157 | 177 |
| 12 | KOHALA MOUNTAIN RD S OF KOHALA RANCH      | LOS  | B   | B   | B    | NB  | 109 | 128  | 144  | SB  | 134 | 157 | 177 |
| 13 | AKONI PULE HWY S OF KOHALA ESTATES        | LOS  | B   | C   | D    | NB  | 223 | 360  | 466  | SB  | 362 | 494 | 642 |
| 14 | WAI MEA-KAWAIHAE RD E OF QUEEN K HWY      | LOS  | C   | D   | E    | EB  | 376 | 732  | 863  | WB  | 168 | 439 | 511 |
| 15 | WAI MEA-KAWAIHAE RD WEST OF KOHALA MTN RD | LOS  | B   | D   | D    | EB  | 240 | 574  | 683  | WB  | 192 | 467 | 543 |
| 17 | WAI MEA-KAWAIHAE RD EAST OF LINDSEY RD    | LOS  | C   | E   | E    | EB  | 458 | 798  | 980  | WB  | 469 | 729 | 922 |
| 18 | MAMALAHOA HWY NO OF LINDSEY RD            | LOS  | D   | E   | E    | NB  | 513 | 804  | 971  | SB  | 554 | 773 | 917 |
| 20 | MAMALAHOA HWY SO OF LINDSEY RD            | LOS  | B   | C   | C    | NB  | 314 | 389  | 448  | SB  | 275 | 350 | 400 |
| 38 | PALANI RD MAUKA OF QUEEN KAAHUMANU HWY    | LOS  | D   | E   | E    | EB  | 749 | 968  | 1108 | WB  | 419 | 572 | 641 |

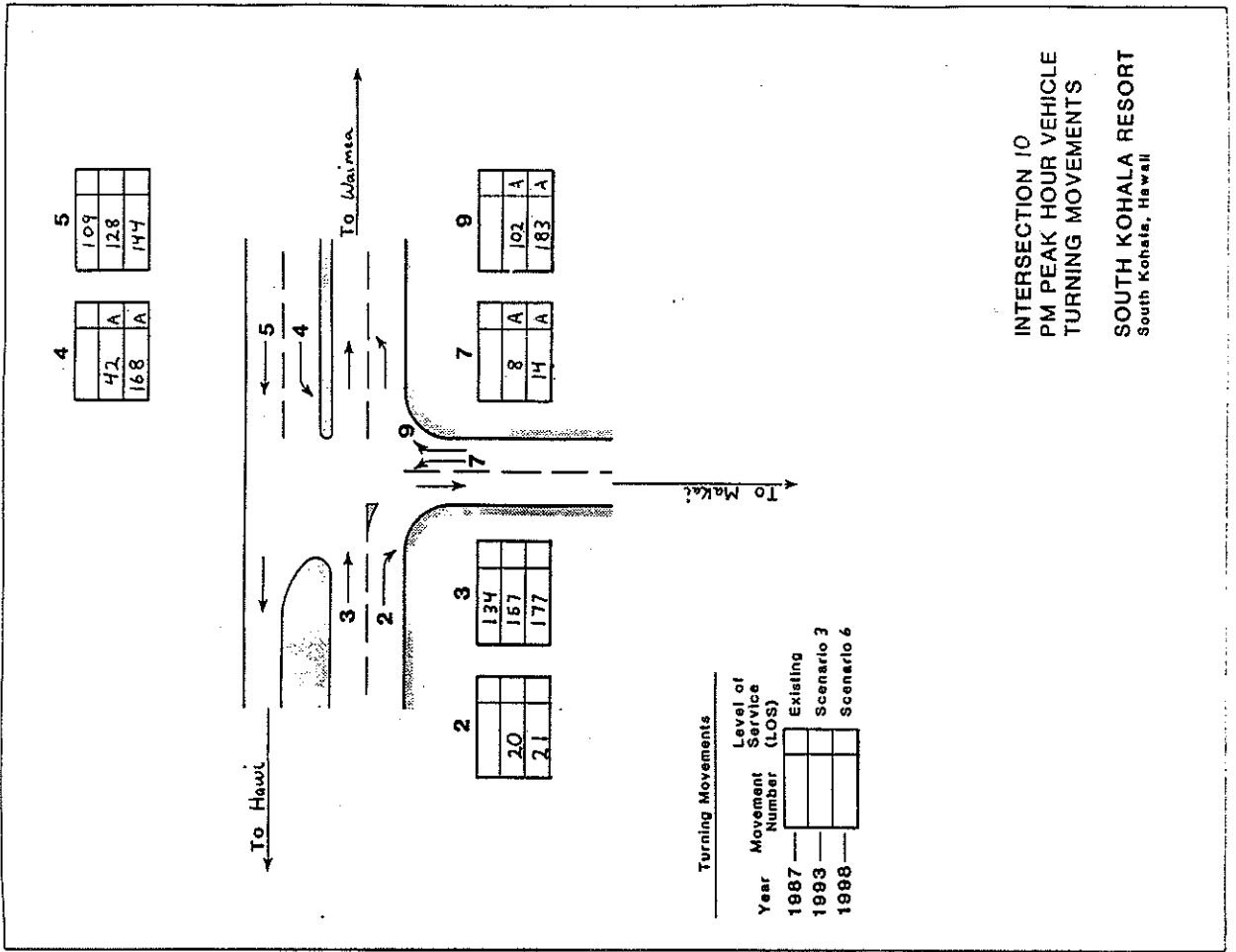
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|----|--------------------------------------------|-----|---|---|---|----|-----|-----|------|----|------|------|------|
| 39 | QUEEN KAAHUMANU HWY SO OF PALANI RD        | LOS | D | E | F | NB | 496 | 656 | 784  | SB | 793  | 1087 | 1228 |
| 41 | QUEEN KAAHUMANU HWY NO OF PALANI RD        | LOS | E | F | F | NB | 570 | 976 | 1101 | SB | 1155 | 1738 | 1967 |
| 42 | QUEEN KAAHUMANU HWY SO OF PALISADES RD     | LOS | C | E | E | NB | 366 | 737 | 834  | SB | 544  | 1045 | 1190 |
| 45 | QUEEN KAAHUMANU HWY SO OF KEAHOLE AIRPORT  | LOS | C | E | F | NB | 275 | 796 | 1045 | SB | 544  | 1244 | 1545 |
| 48 | QUEEN KAAHUMANU HWY SO OF WAIKOLOA BEACH   | LOS | B | E | E | NB | 153 | 666 | 899  | SB | 382  | 1001 | 1268 |
| 51 | QUEEN KAAHUMANU HWY SO OF WAIKOLOA MAUKA   | LOS | B | D | E | NB | 206 | 758 | 997  | SB | 295  | 760  | 1030 |
| 54 | QUEEN KAAHUMANU HWY SO OF MAUNA LANI       | LOS | B | D | E | NB | 231 | 736 | 980  | SB | 281  | 714  | 967  |
| 57 | QUEEN KAAHUMANU HWY SO OF SO KOHALA RESORT | LOS | B | D | E | NB | 254 | 515 | 1085 | SB | 282  | 703  | 956  |
| 60 | QUEEN KAAHUMANU HWY SO OF MAUNA KEA RESORT | LOS | B | D | E | NB | 293 | 559 | 1161 | SB | 282  | 754  | 1001 |
| 63 | QUEEN KAAHUMANU HWY SO OF WAI MEA-KAWAIHAE | LOS | B | E | E | NB | 360 | 904 | 1211 | SB | 223  | 749  | 995  |

\* LOS FOR FOUR LANE ROADWAY

SUMMARY  
SOUTH KOHALA RESORT TRAFFIC STUDY  
ROADWAY LEVEL OF SERVICE ANALYSIS PM PEAK HOUR  
SCENARIO 3 & 6  
RITZ CARLTON, SOUTH KOHALA RESORT, HYATT, HOTEL 'X', KOHALA  
RANCH + EXISTING TRAFFIC

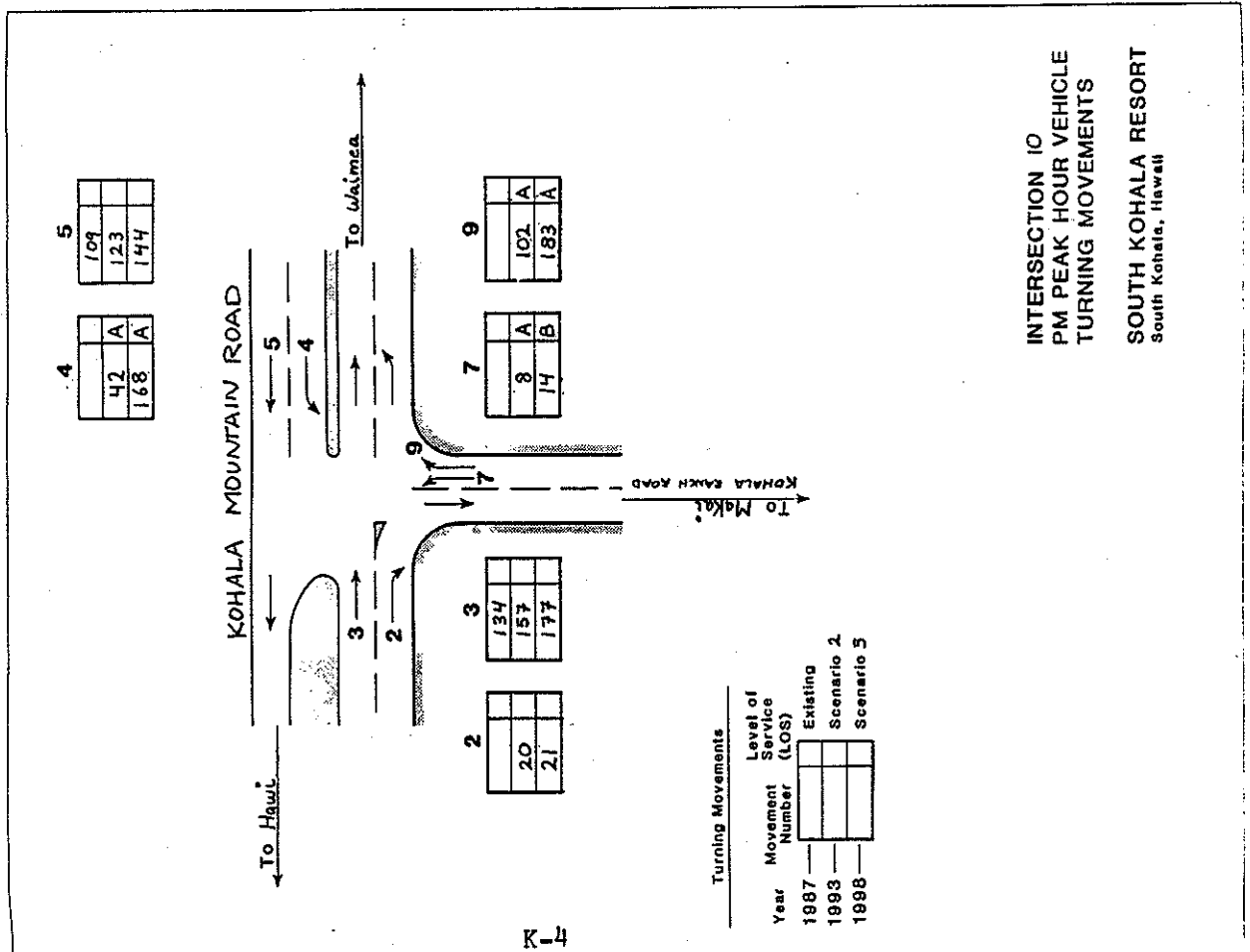
| ID | DESCRIPTION                              | 1987 1993 1998 |     |     |     | LOS | D   | E    |      |      |      |      |
|----|------------------------------------------|----------------|-----|-----|-----|-----|-----|------|------|------|------|------|
|    |                                          | B              | C   | D   | F   |     |     |      |      |      |      |      |
| 1  | AKONI PULE HWY N OF KOHALA RANCH         | 223            | 396 | 466 | 362 | 537 | 629 | 1135 | 1751 | 1973 | 1101 | 1228 |
| 4  | AKONI PULE HWY S OF KOHALA RANCH         | 109            | 136 | 158 | 134 | 177 | 198 | 275  | 781  | 1045 | 834  | 1196 |
| 11 | KOHALA MOUNTAIN RD N OF KOHALA RANCH     | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 12 | KOHALA MOUNTAIN RD S OF KOHALA RANCH     | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 13 | AKONI PULE HWY S OF KOHALA ESTATES       | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 14 | WAINEA-KAWAIHAE RD E OF QUEEN K HWY      | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 15 | WAINEA-KAWAIHAE RD WEST OF KOHALA MTN RD | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 17 | WAINEA-KAWAIHAE RD EAST OF LINDSEY RD    | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 18 | MAMALAOA HWY NO OF LINDSEY RD            | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 20 | MAMALAOA HWY SO OF LINDSEY RD            | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |
| 38 | PALANI RD MAUKA OF QUEEN KAHUMANU HWY    | 109            | 170 | 312 | 134 | 259 | 360 | 206  | 742  | 997  | 1018 | 1275 |





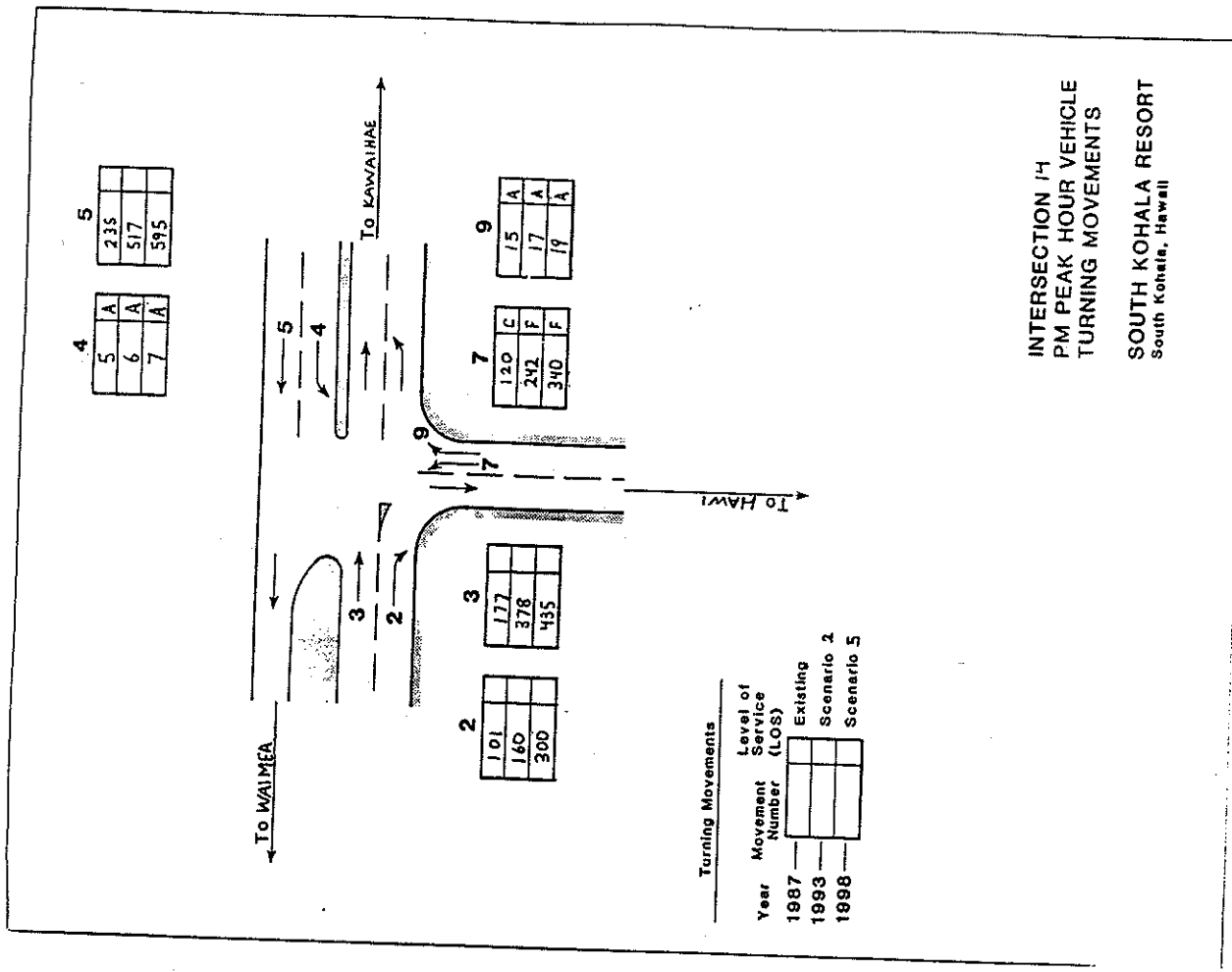
INTERSECTION 10  
PM PEAK HOUR VEHICLE  
TURNING MOVEMENTS

SOUTH KOHALA RESORT  
South Kohala, Hawaii

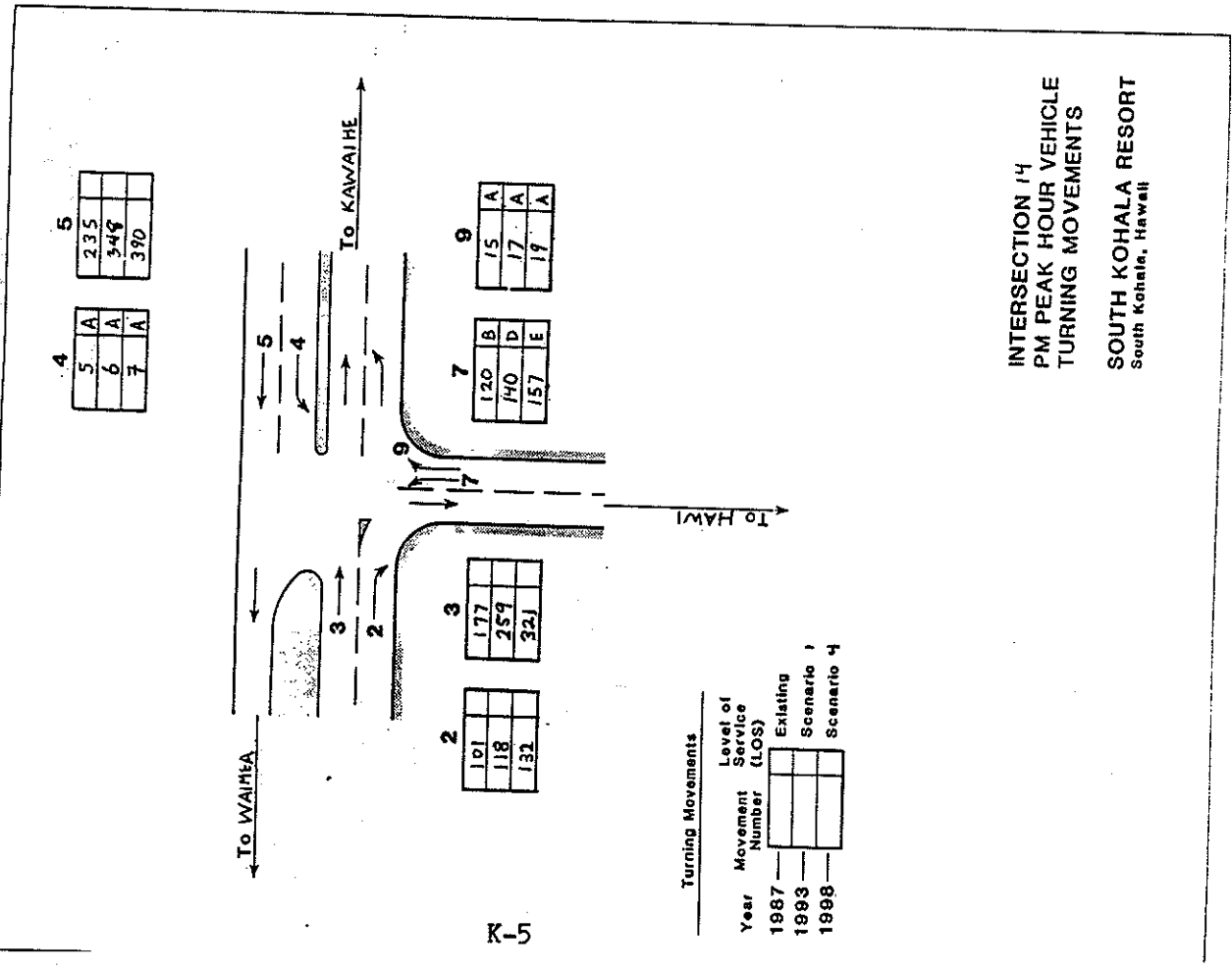


INTERSECTION 10  
PM PEAK HOUR VEHICLE  
TURNING MOVEMENTS

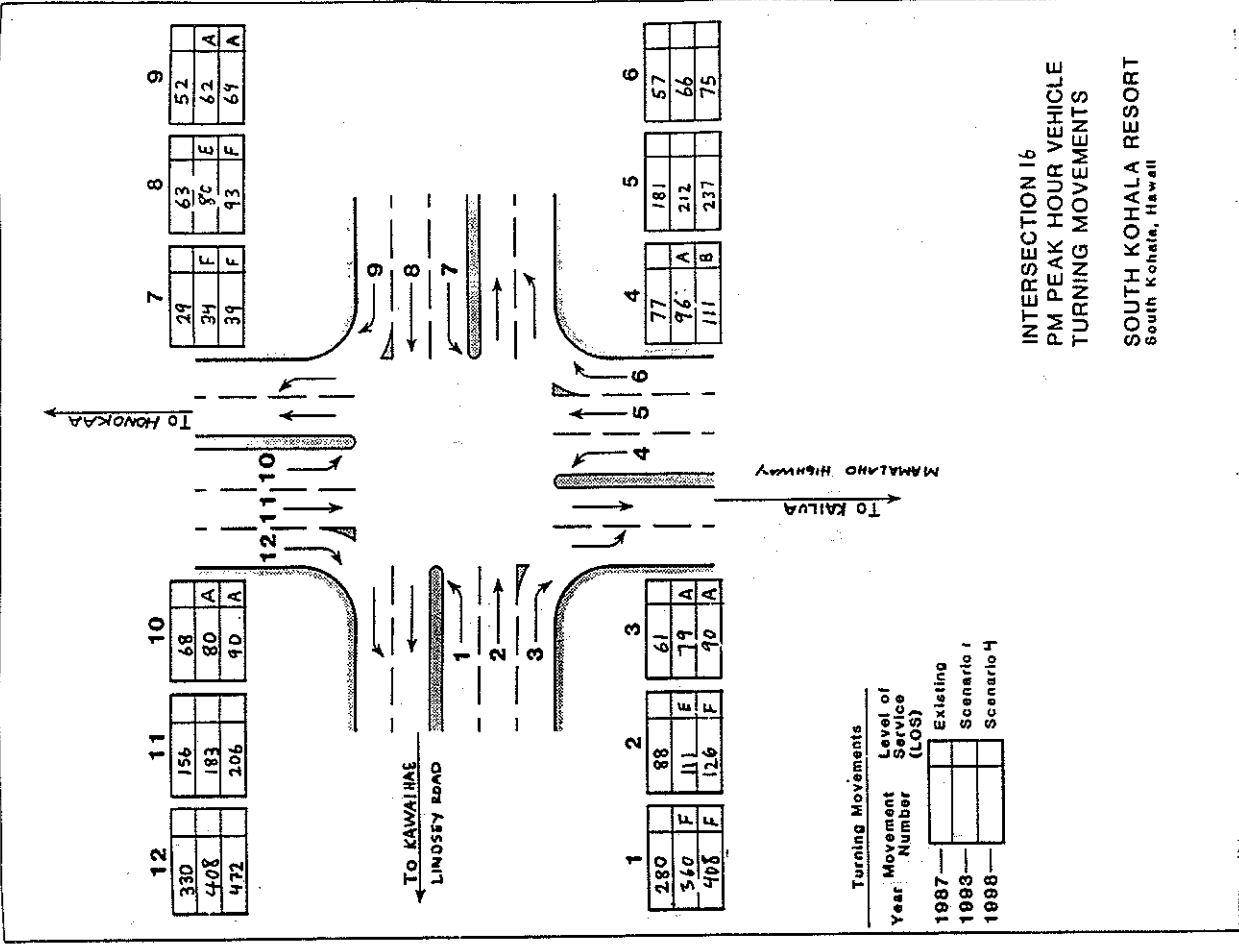
SOUTH KOHALA RESORT  
South Kohala, Hawaii



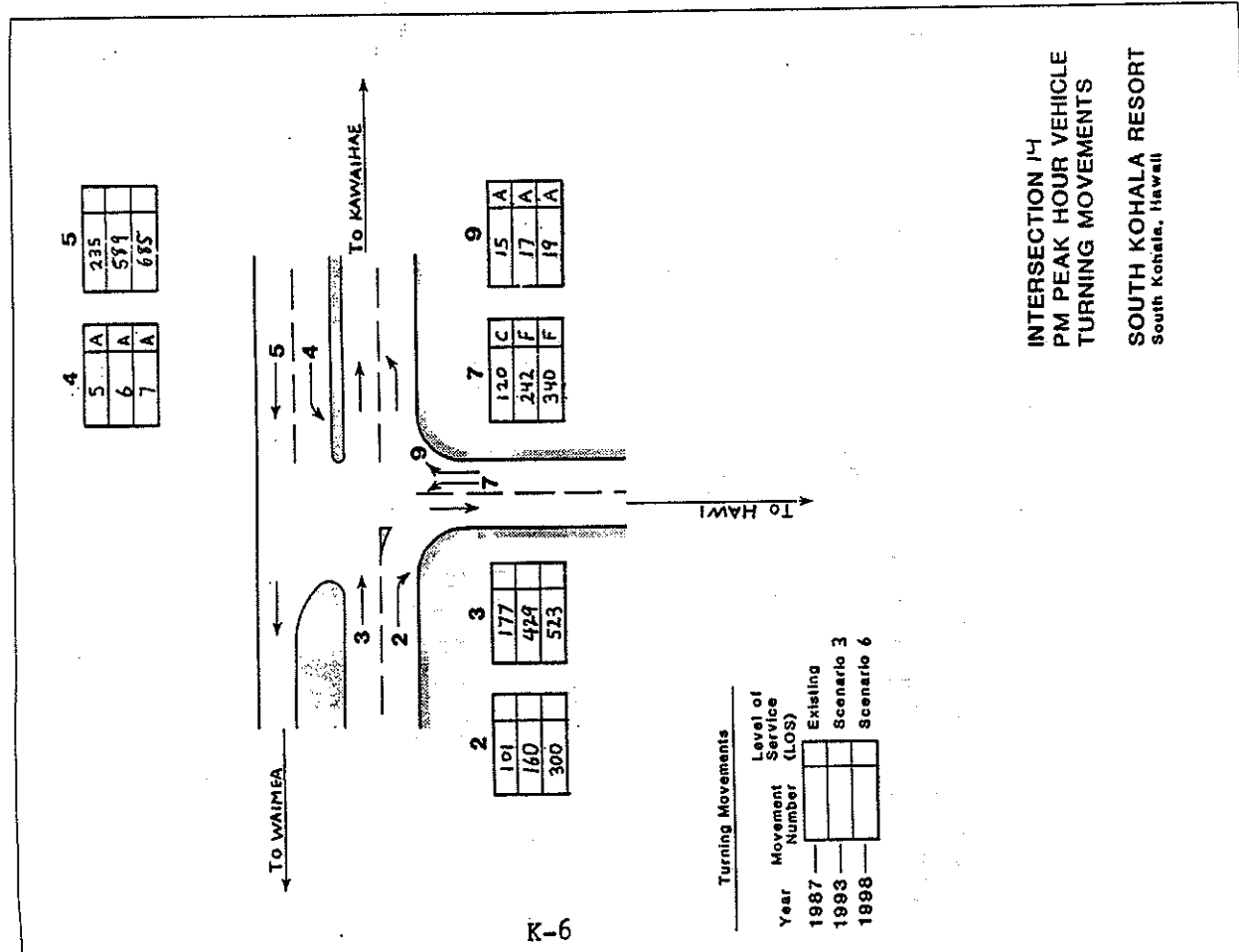
INTERSECTION 14  
 PM PEAK HOUR VEHICLE  
 TURNING MOVEMENTS  
 SOUTH KOHALA RESORT  
 South Kohala, Hawaii



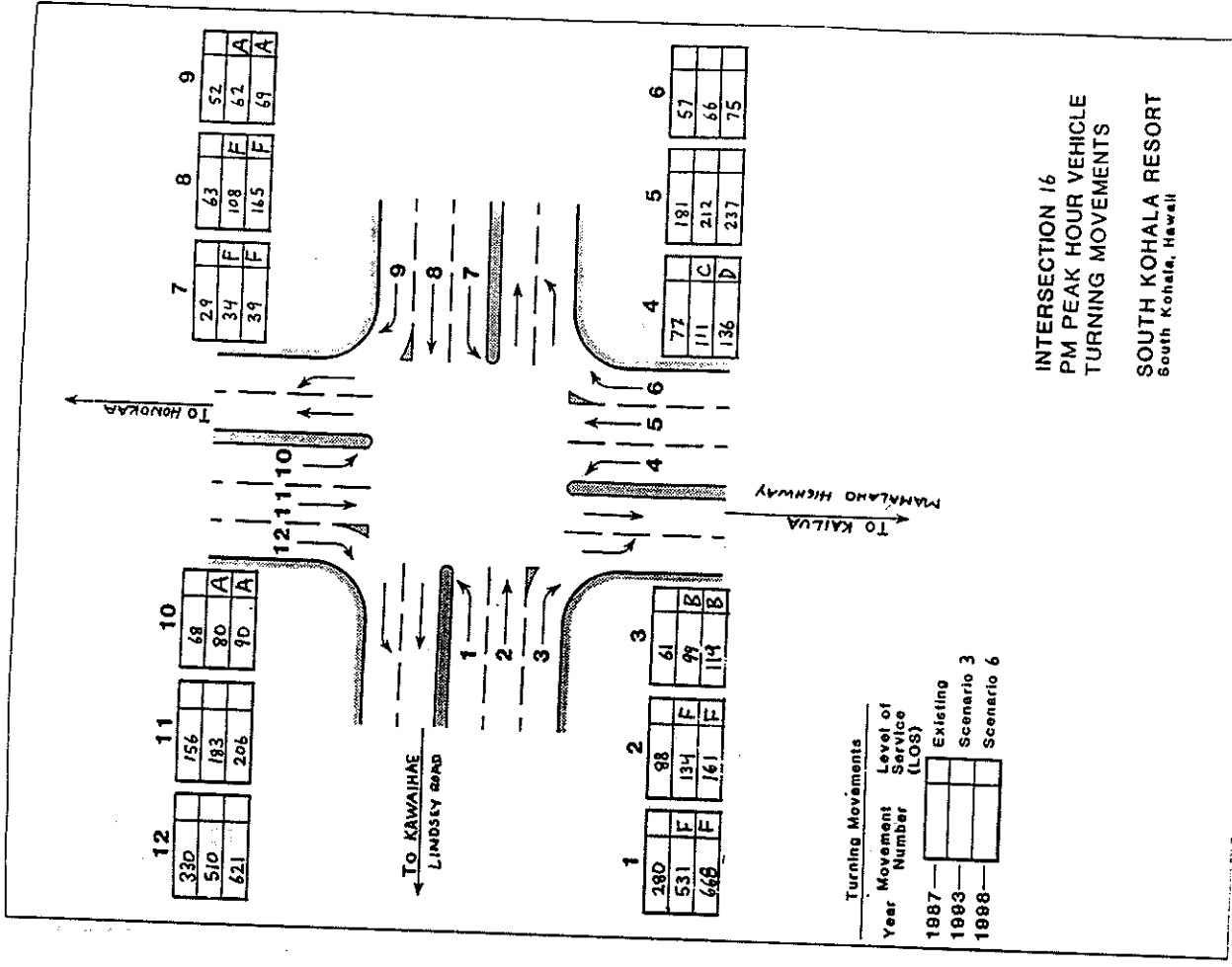
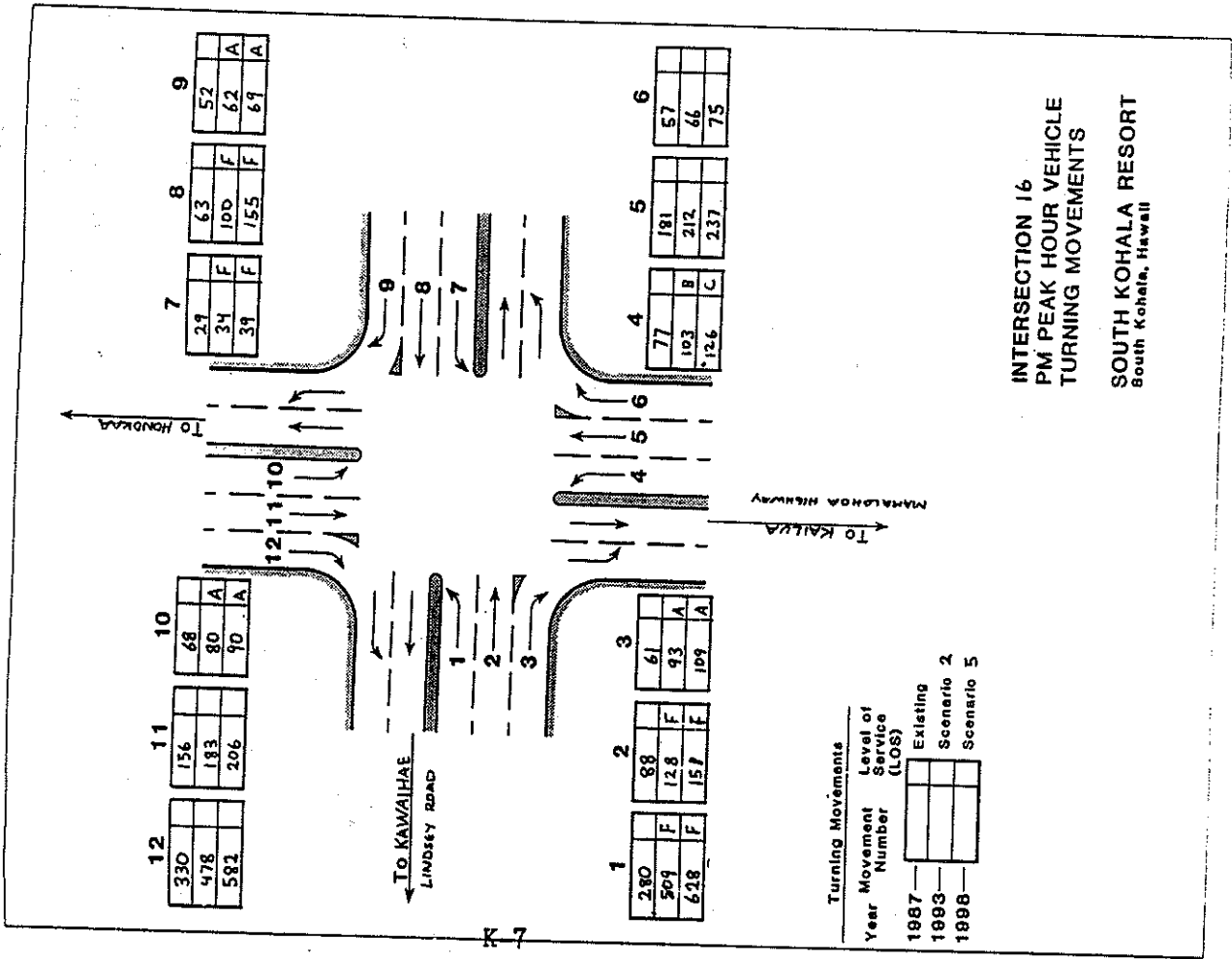
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 PM PEAK HOUR VEHICLE  
 TURNING MOVEMENTS  
 SOUTH KOHALA RESORT  
 South Kohala, Hawaii

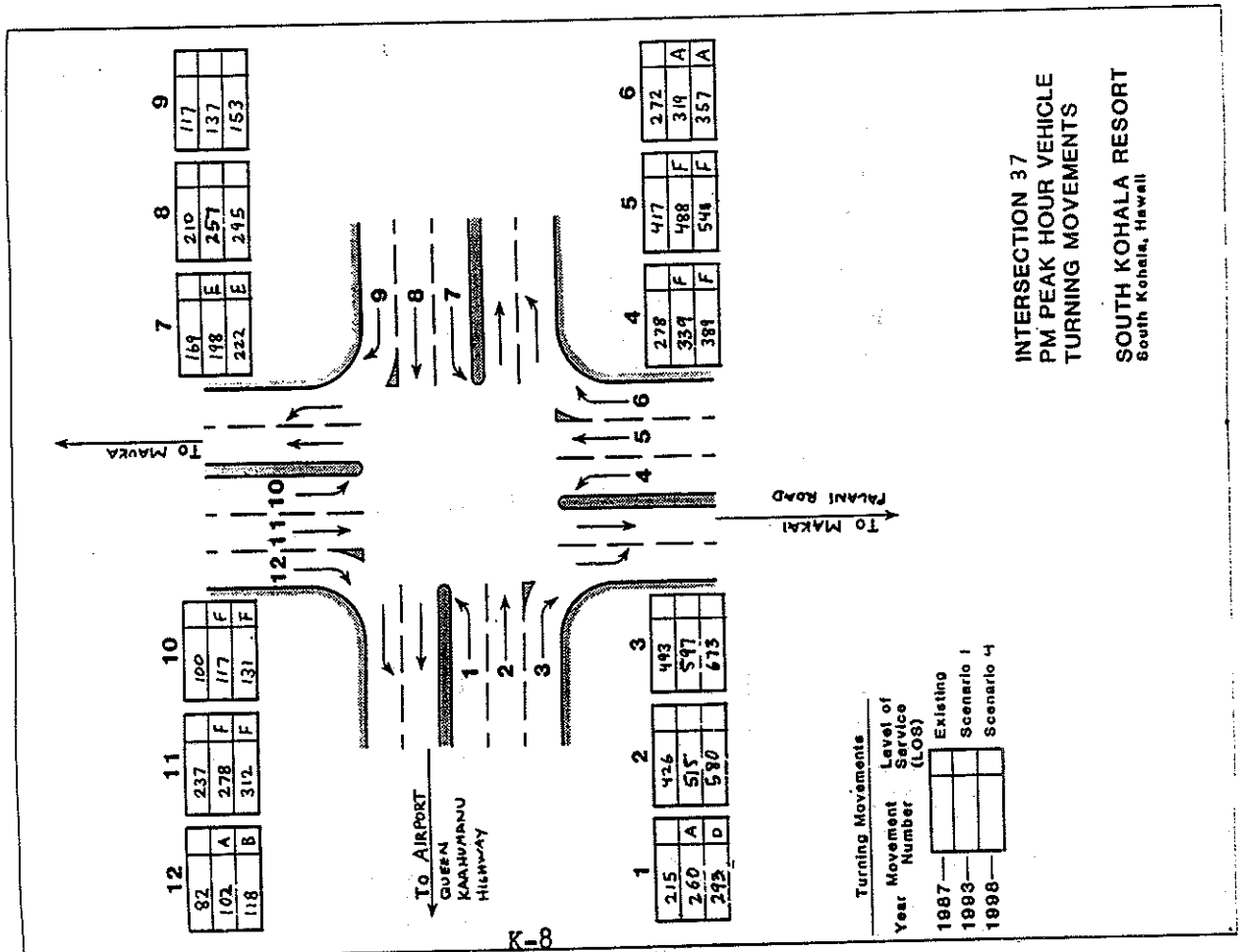
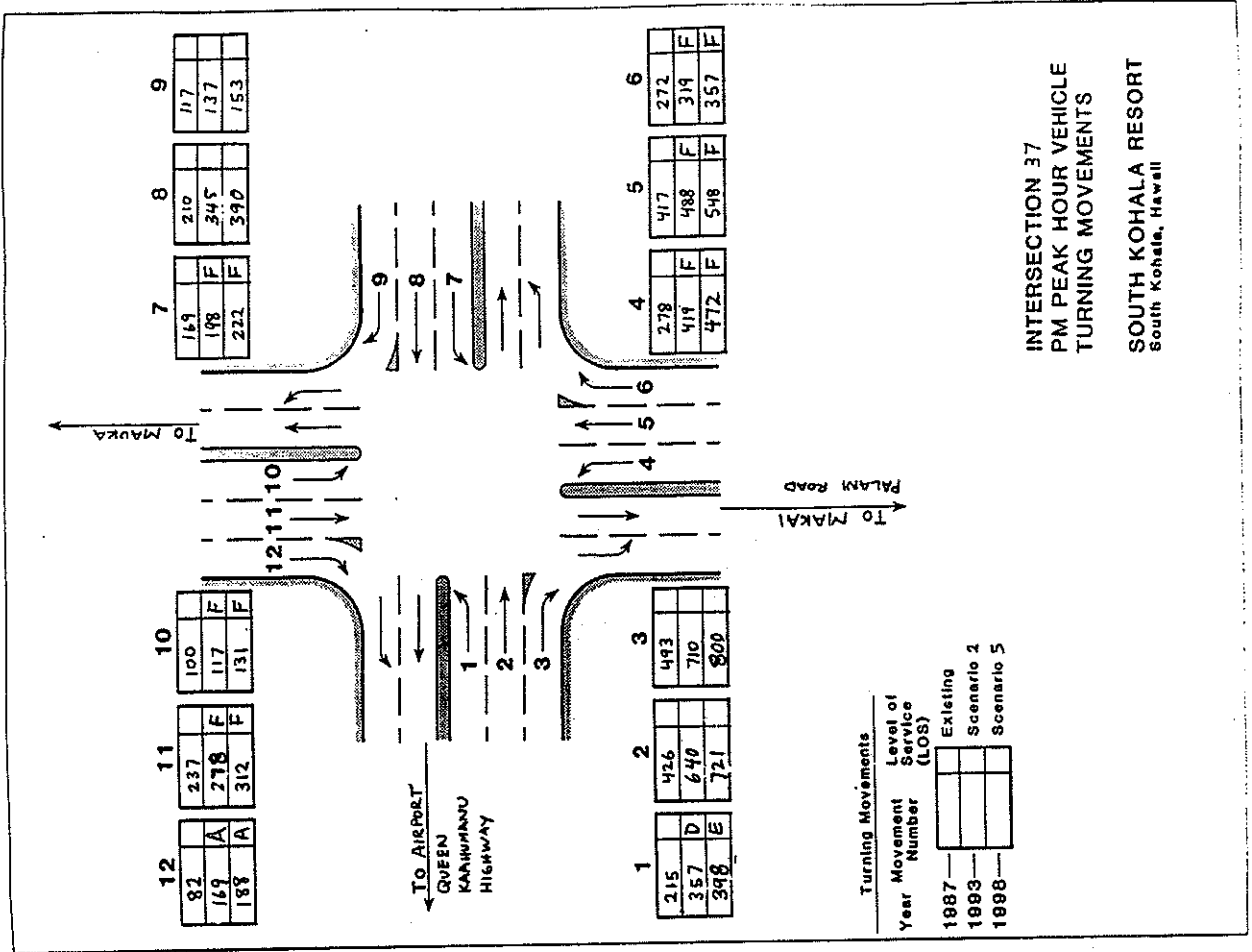


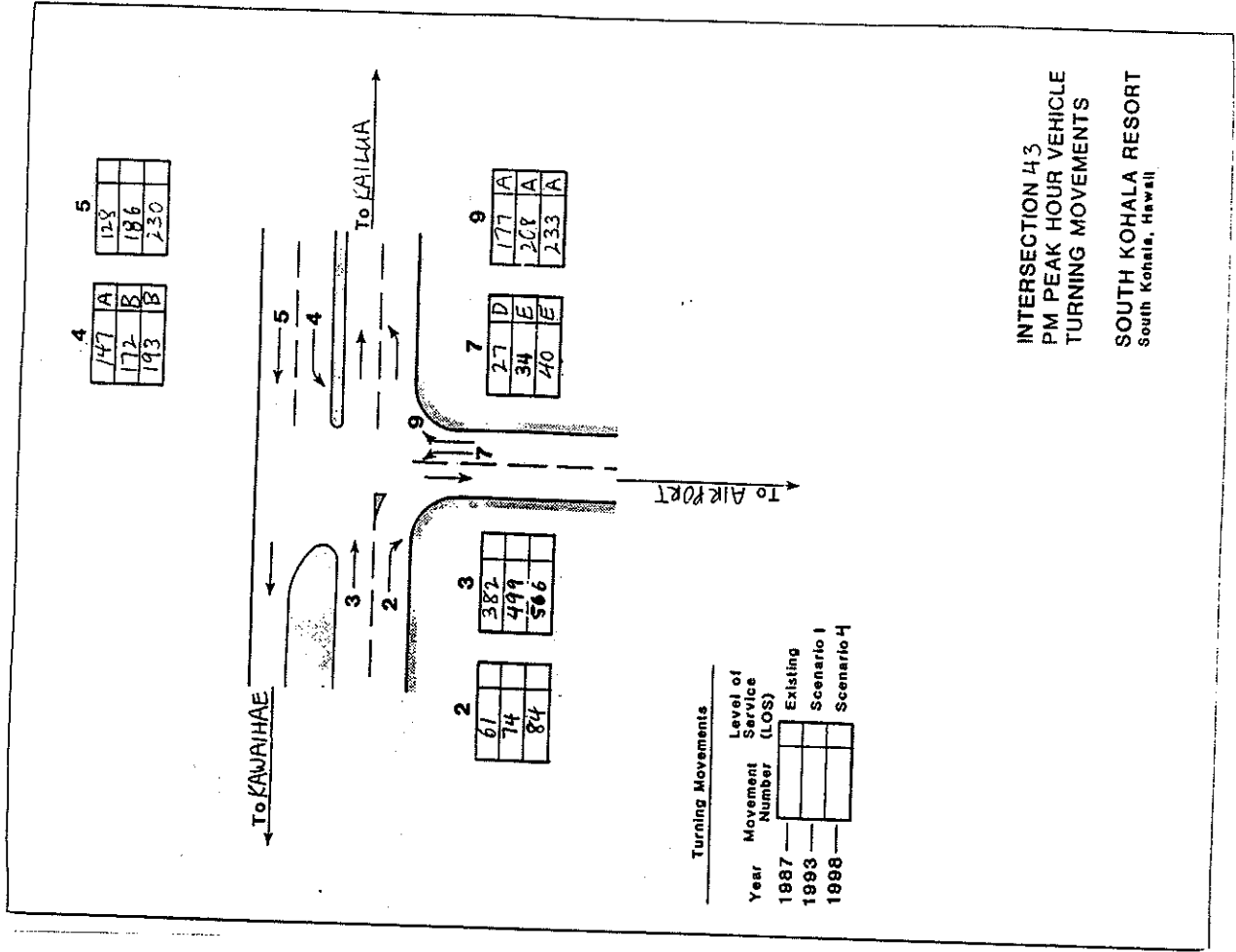
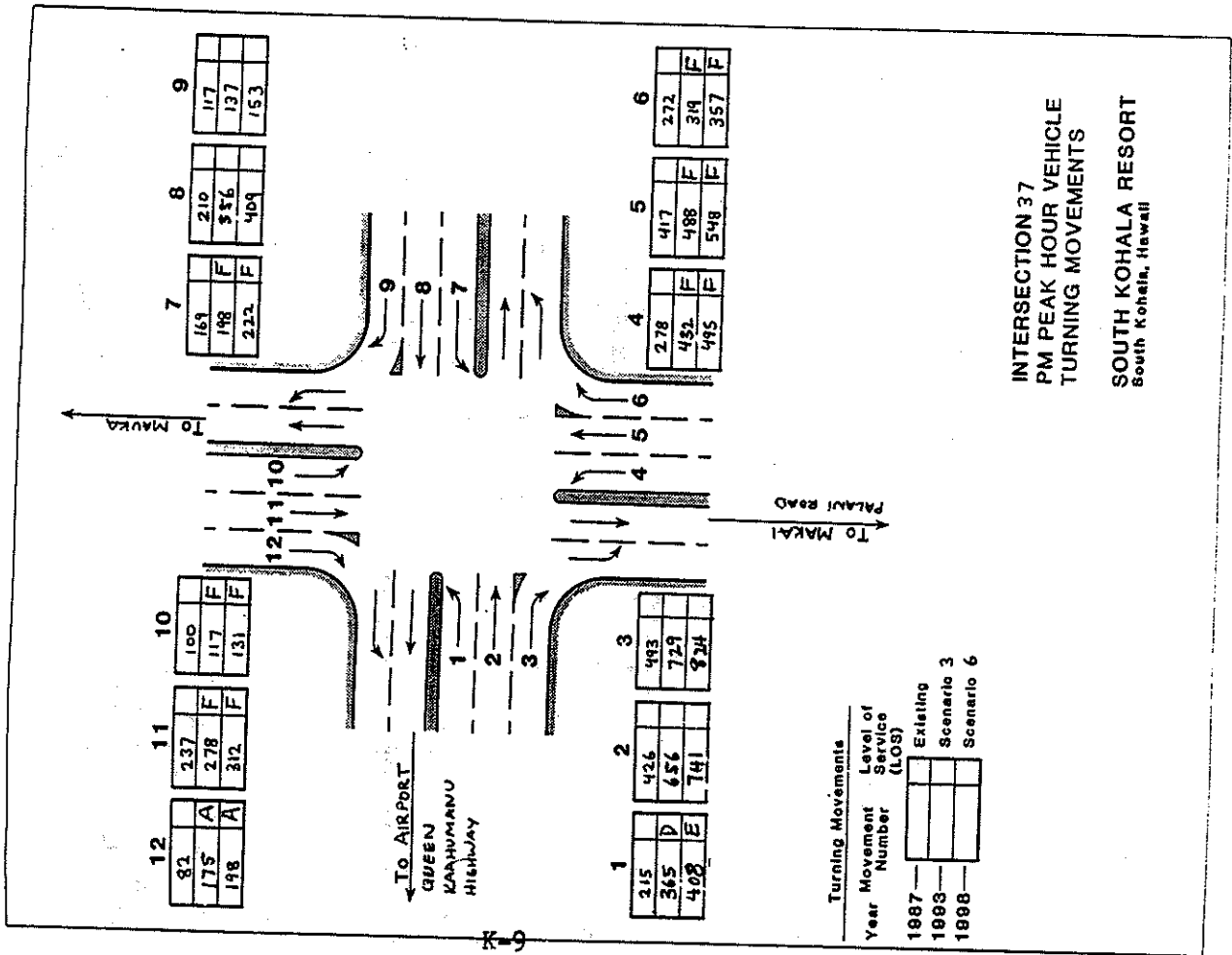
INTERSECTION 16  
 PM PEAK HOUR VEHICLE  
 TURNING MOVEMENTS  
 SOUTH KOHALA RESORT  
 South Kohala, Hawaii

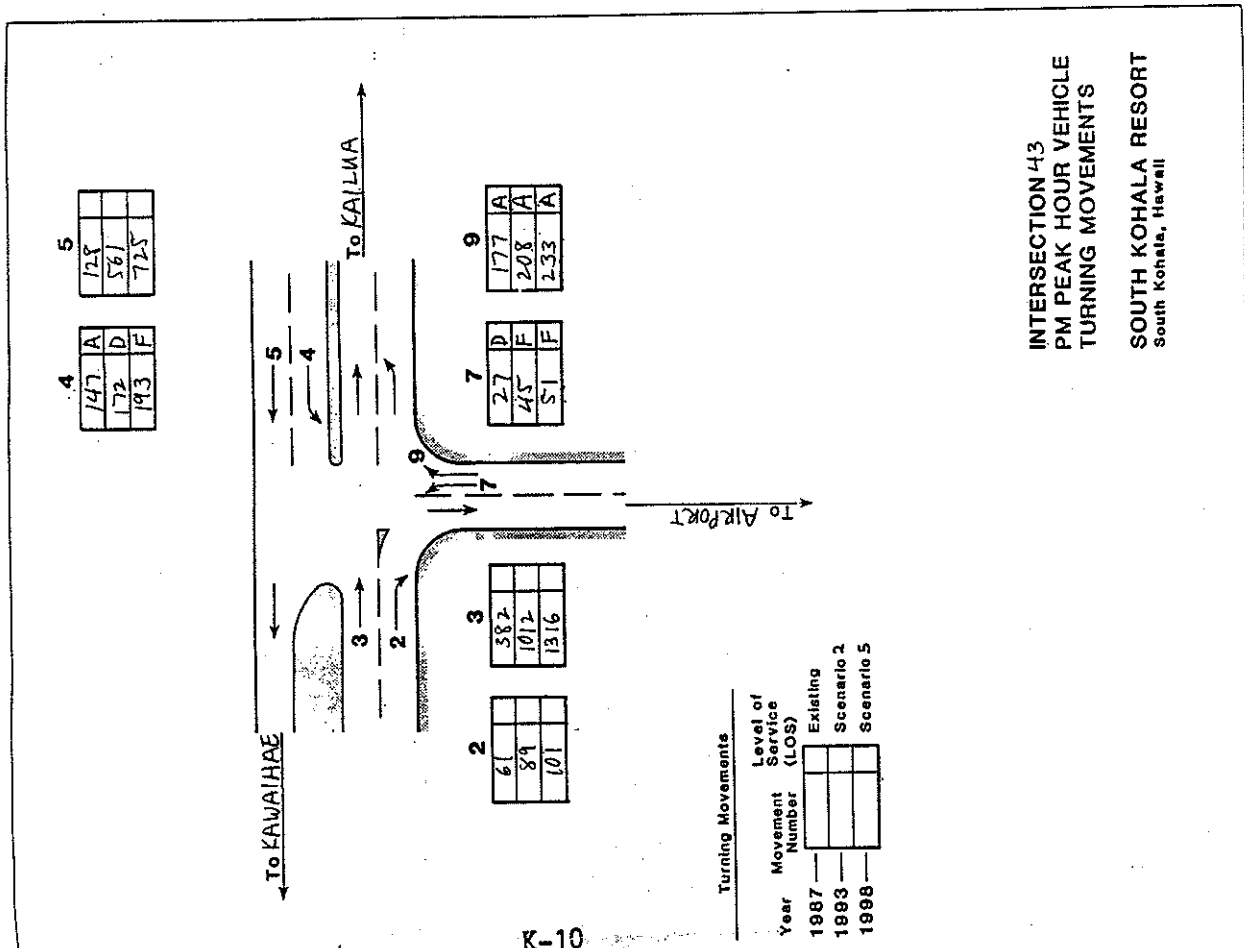
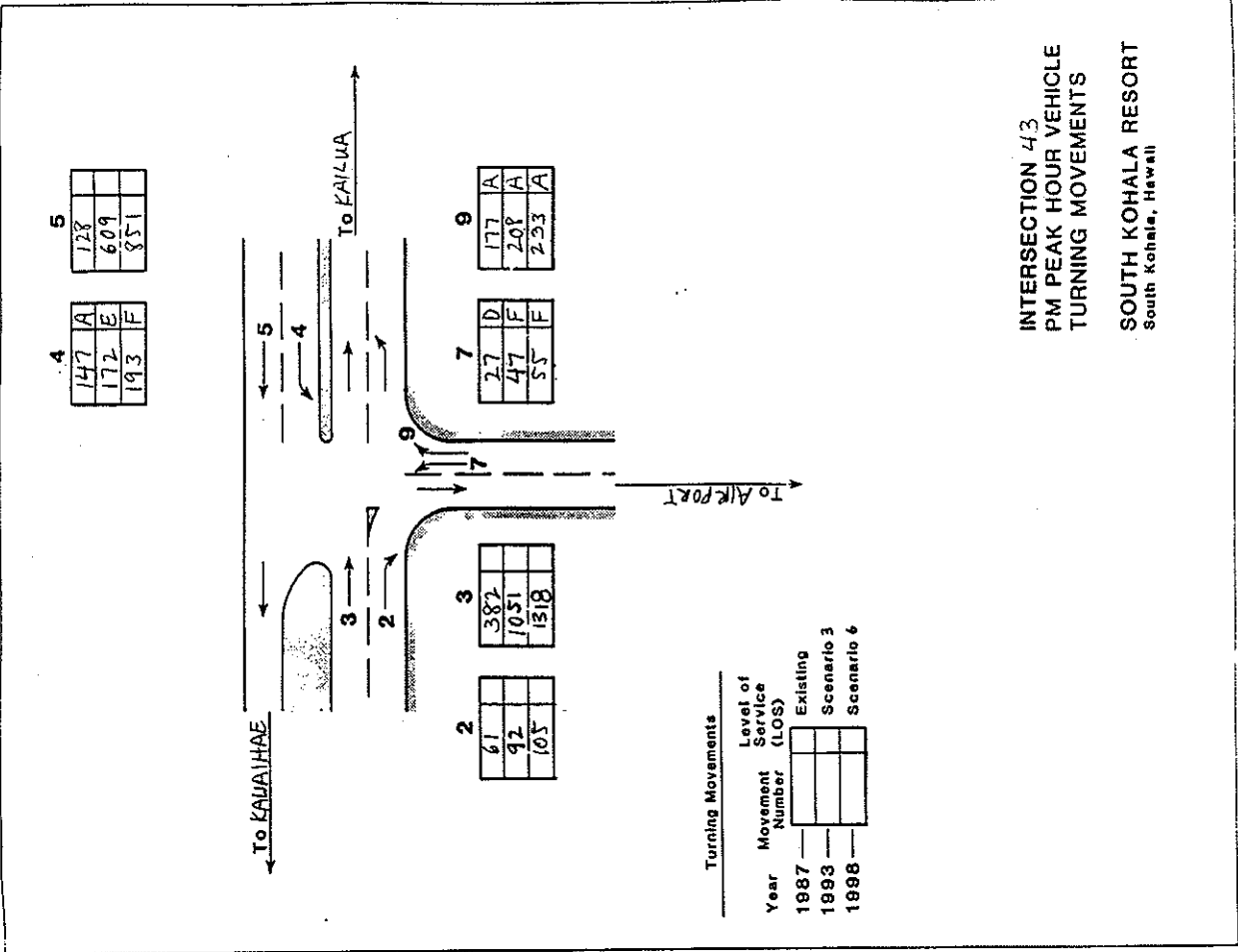


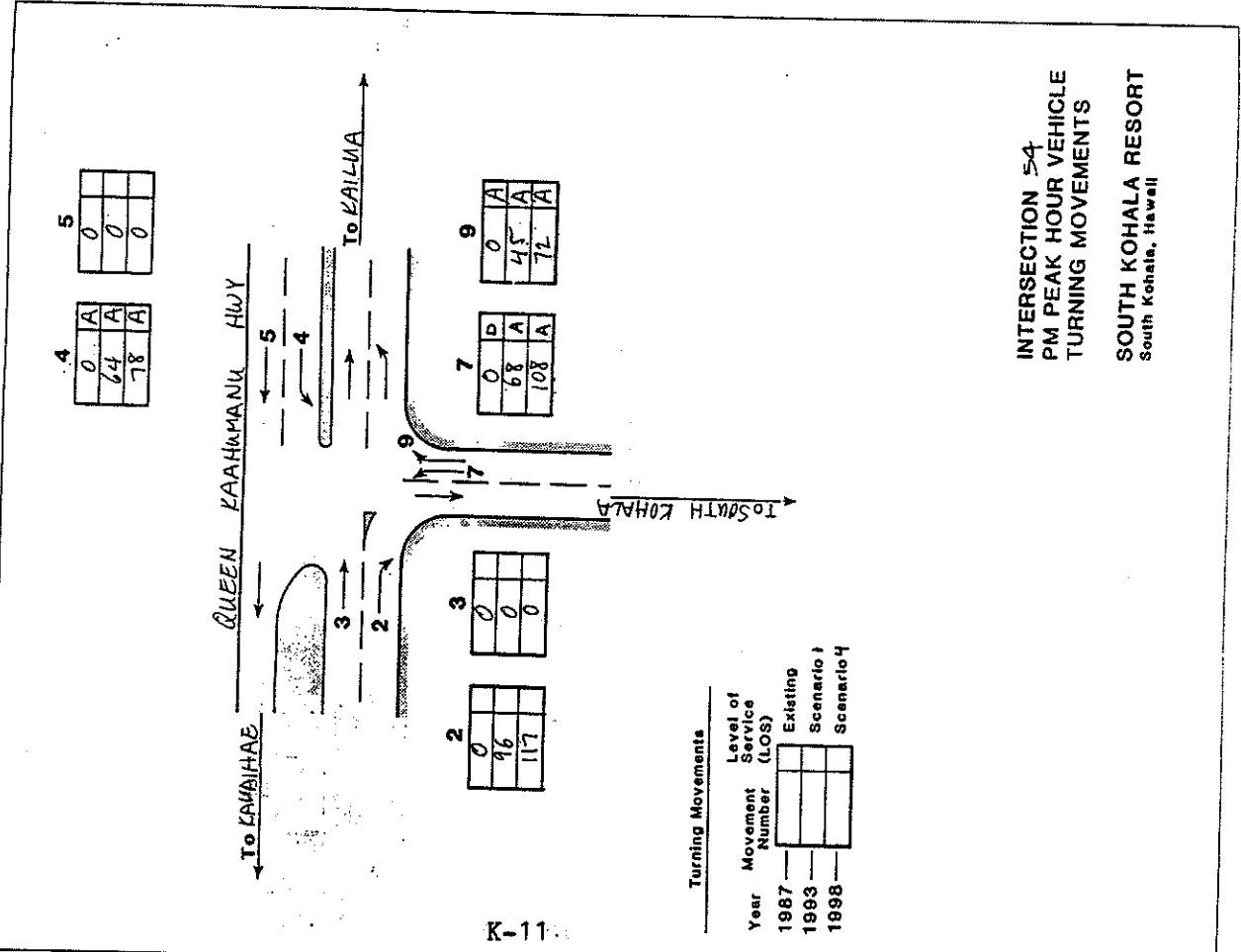
INTERSECTION 14  
 PM PEAK HOUR VEHICLE  
 TURNING MOVEMENTS  
 SOUTH KOHALA RESORT  
 South Kohala, Hawaii



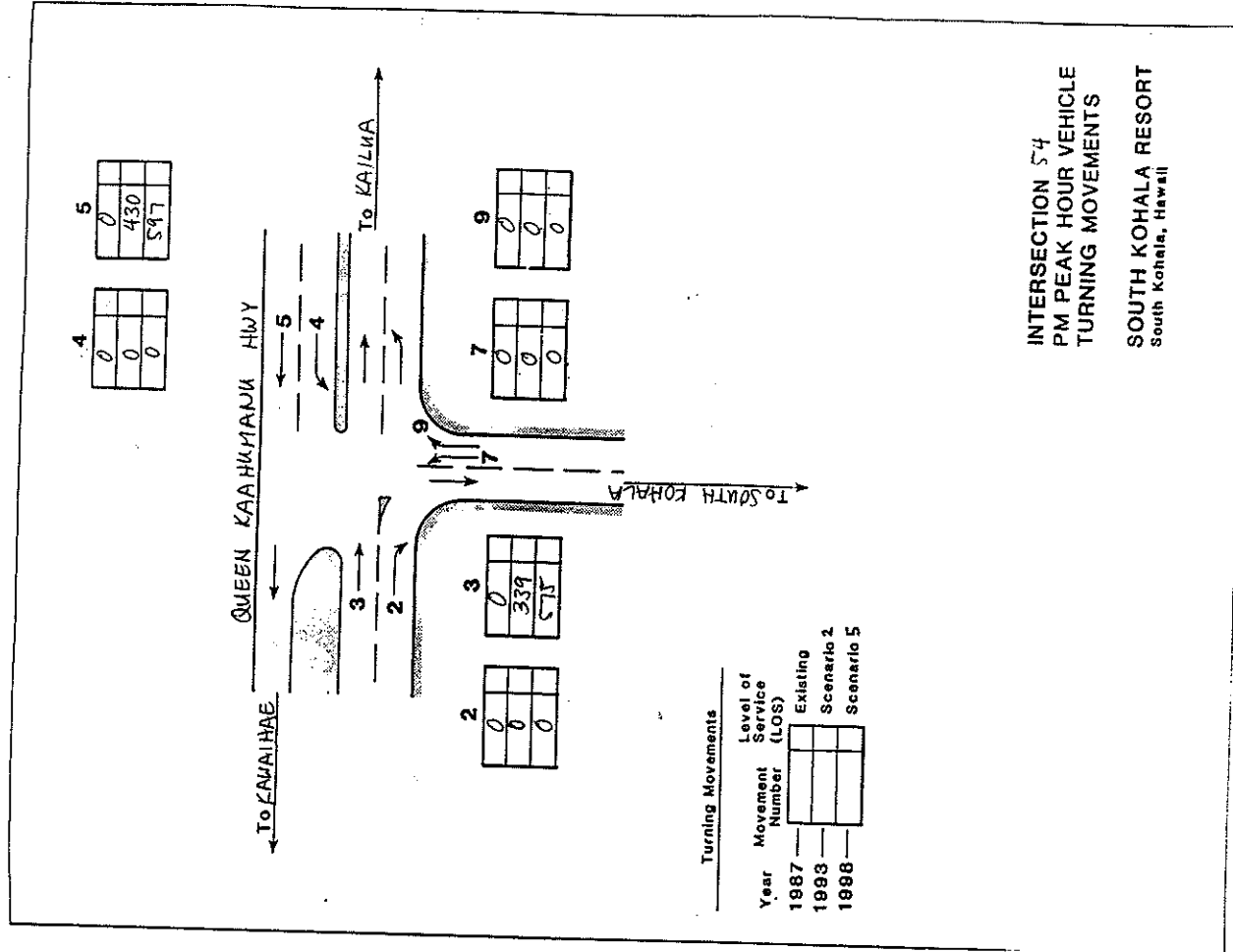






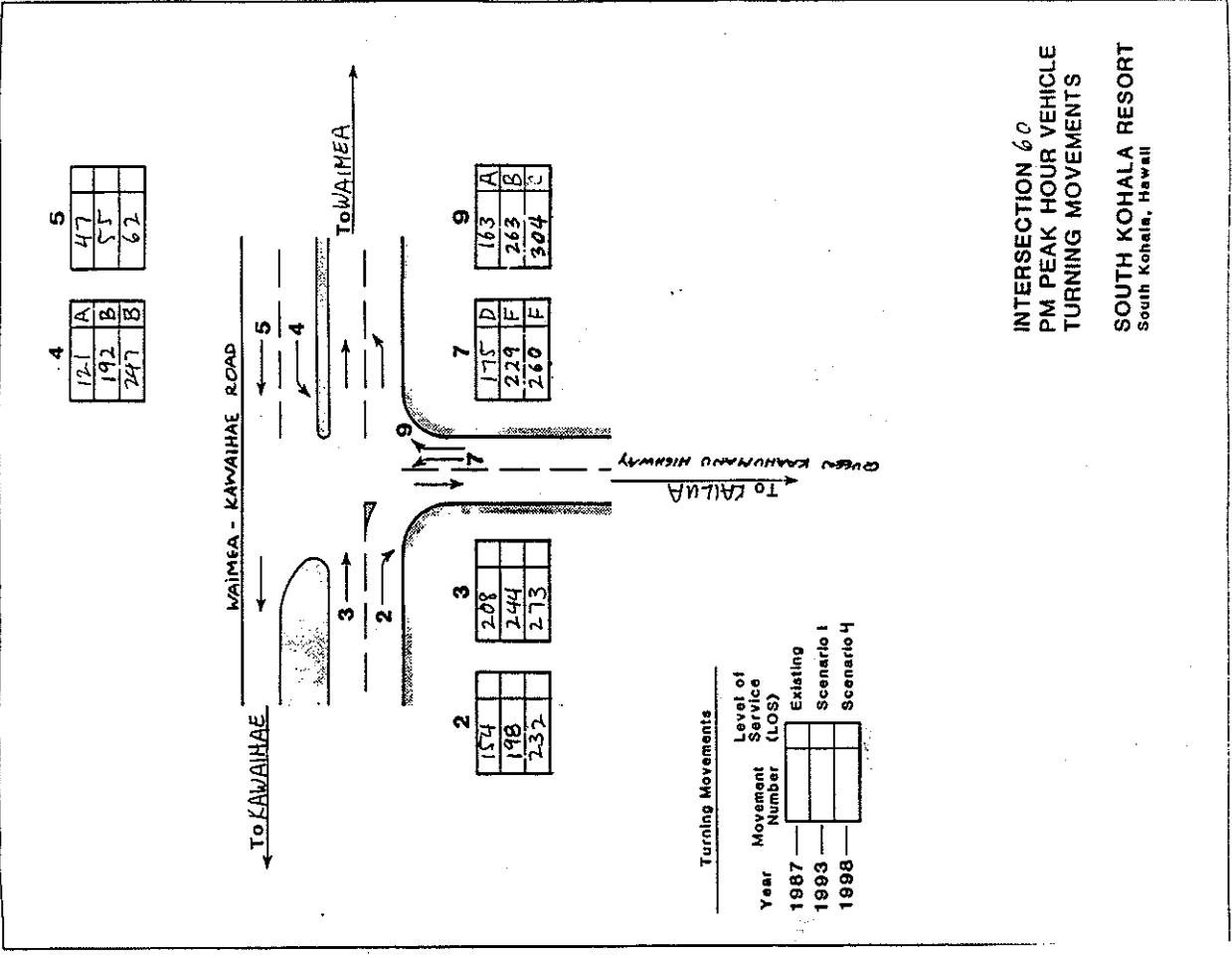


**INTERSECTION 54**  
**PM PEAK HOUR VEHICLE**  
**TURNING MOVEMENTS**  
**SOUTH KOHALA RESORT**  
 South Kohala, Hawaii



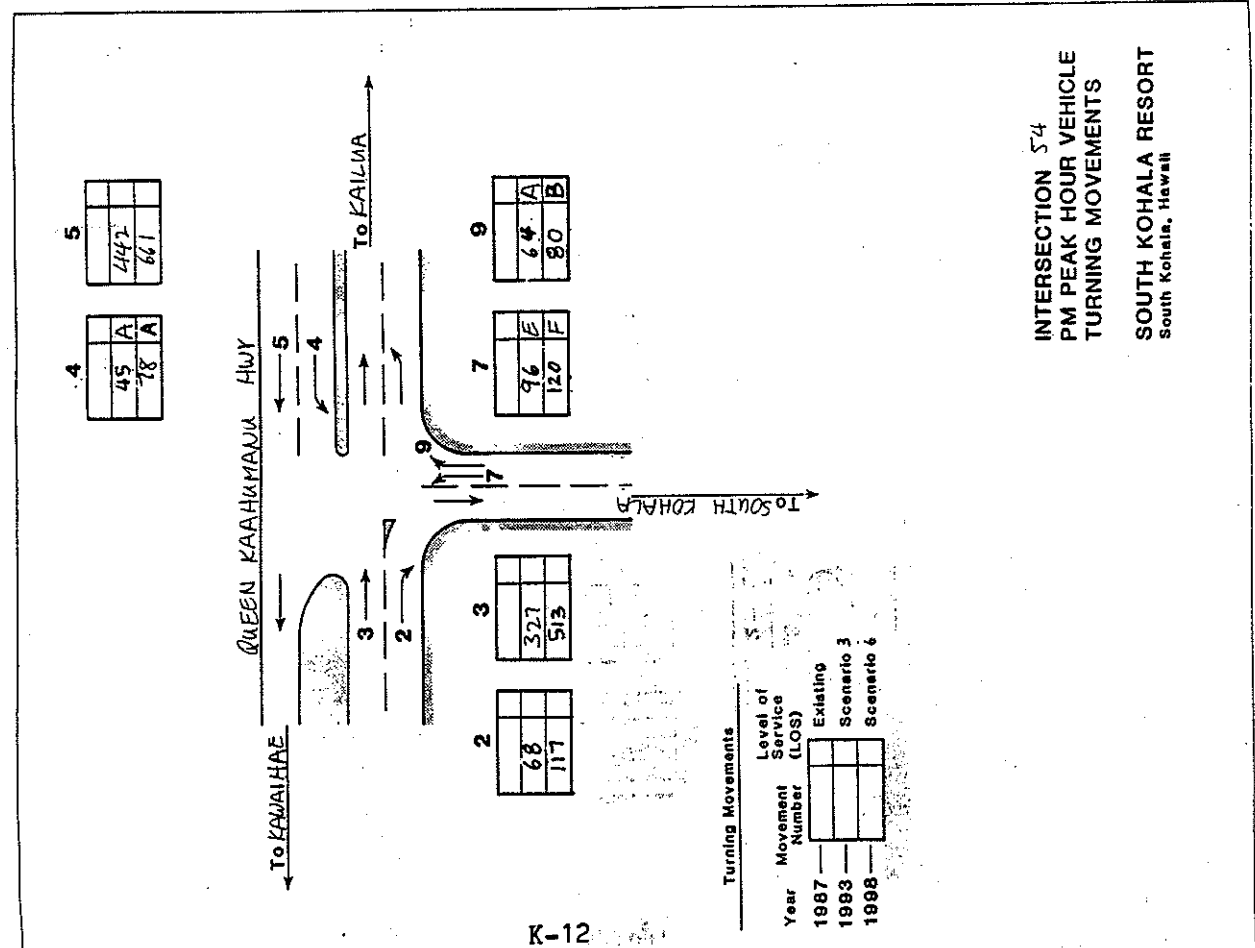
**INTERSECTION 54**  
**PM PEAK HOUR VEHICLE**  
**TURNING MOVEMENTS**  
**SOUTH KOHALA RESORT**  
 South Kohala, Hawaii





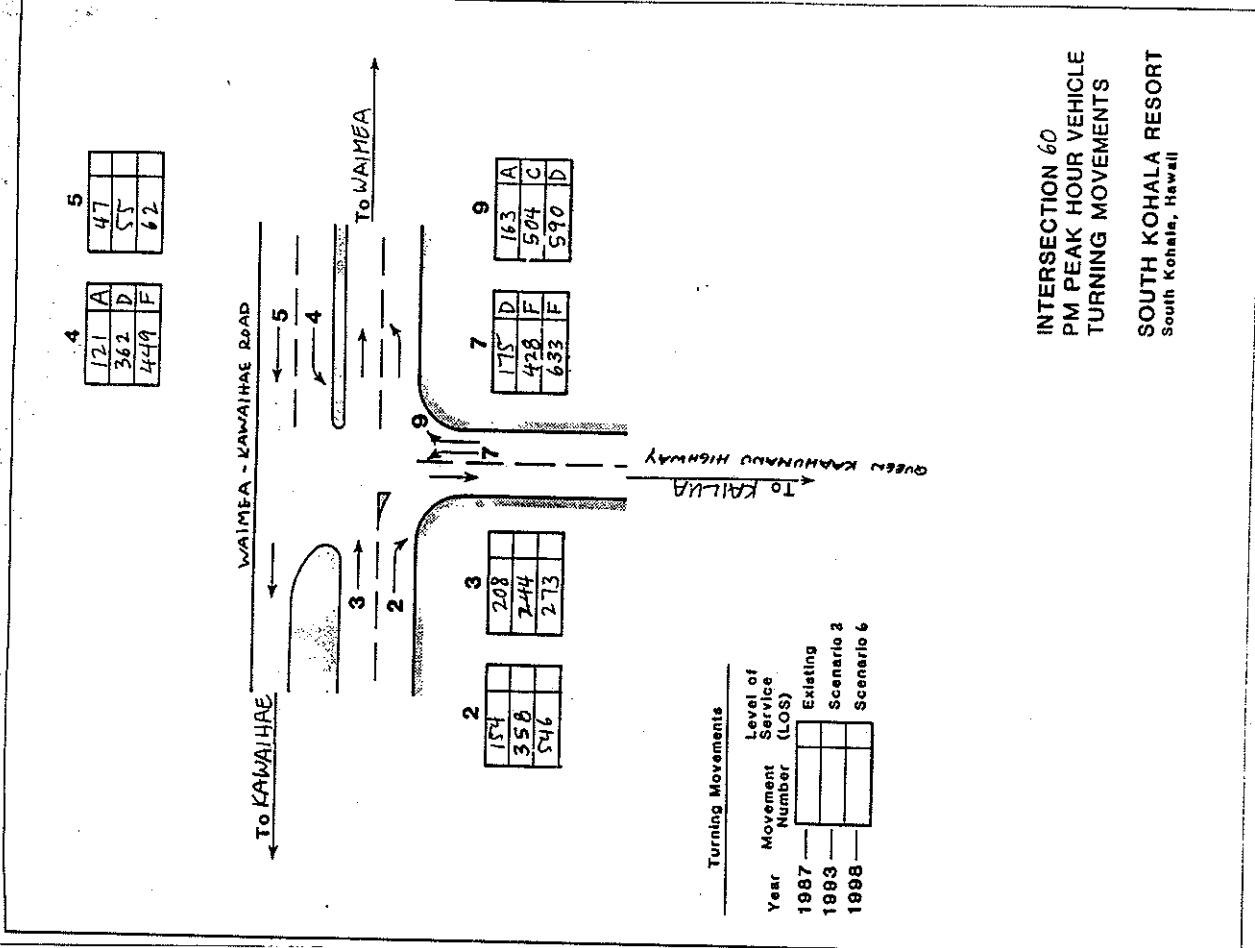
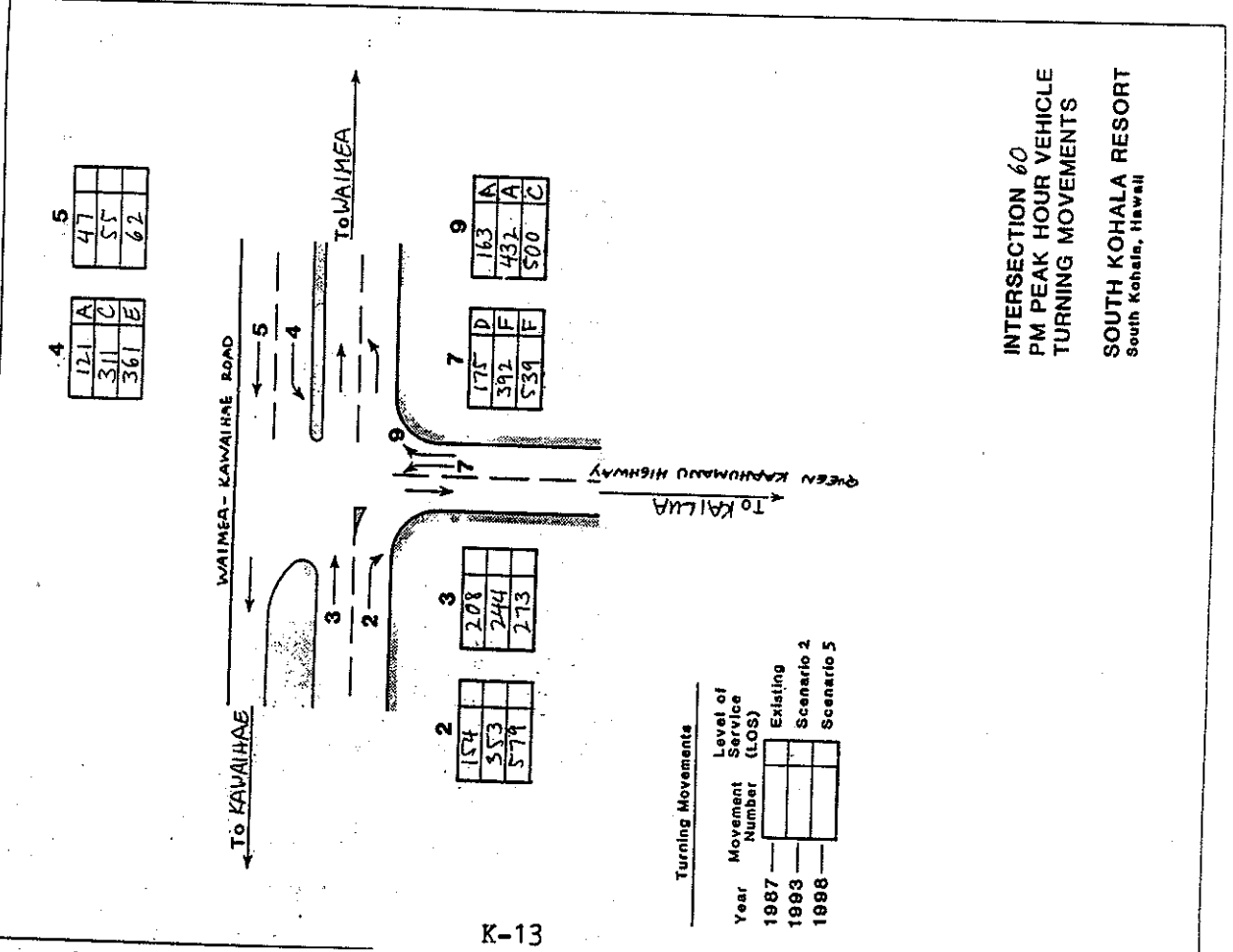
INTERSECTION 60  
PM PEAK HOUR VEHICLE  
TURNING MOVEMENTS

SOUTH KOHALA RESORT  
South Kohala, Hawaii



INTERSECTION 54  
PM PEAK HOUR VEHICLE  
TURNING MOVEMENTS

SOUTH KOHALA RESORT  
South Kohala, Hawaii



|     |   |    |
|-----|---|----|
| 4   |   | 5  |
| 121 | A | 47 |
| 311 | C | 55 |
| 361 | E | 62 |

|     |   |    |
|-----|---|----|
| 4   |   | 5  |
| 121 | A | 47 |
| 362 | D | 55 |
| 449 | F | 62 |

|     |   |     |
|-----|---|-----|
| 7   |   | 9   |
| 175 | D | 163 |
| 392 | F | 432 |
| 539 | F | 500 |

|     |   |     |
|-----|---|-----|
| 7   |   | 9   |
| 175 | D | 163 |
| 428 | F | 504 |
| 633 | F | 590 |

|     |  |     |
|-----|--|-----|
| 2   |  | 3   |
| 154 |  | 208 |
| 553 |  | 244 |
| 579 |  | 273 |

|     |  |     |
|-----|--|-----|
| 2   |  | 3   |
| 154 |  | 208 |
| 358 |  | 244 |
| 546 |  | 273 |

Turning Movements

| Year | Movement Number | Level of Service (LOS) |
|------|-----------------|------------------------|
| 1987 |                 | Existing               |
| 1993 |                 | Scenario 2             |
| 1998 |                 | Scenario 5             |

Turning Movements

| Year | Movement Number | Level of Service (LOS) |
|------|-----------------|------------------------|
| 1987 |                 | Existing               |
| 1993 |                 | Scenario 2             |
| 1998 |                 | Scenario 6             |