Attn: Jeyan

LINDA CROCKETT LINGLE
Mayor

BRIAN W. MISKAE
Planning Director

Notice of acceptance published in the 2/8/93 OEQC Bulletin. File
— Jeyan

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

January 27, 1993

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Office of Environmental Quality Control
465 South King Street, Suite 104
Honolulu, Hawai'i 96813

Dear Sirs,

RE: Acceptance of Final EIS for the Hana Ranch Country Club.

The Final Environmental Impact Statement for the above referenced project was accepted by the Maui Planning Commission at its regular meeting of January 26, 1993. A copy of the Department Report is enclosed. If further clarification is needed, please contact Mr. Keoni Fairbanks of this office.

Very Truly Yours,

BRIAN MISKAE
Planning Director

encl.

cc: Martin Luna
K. Fairbanks

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

HANA RANCH COUNTRY CLUB

HANA, MAUI, HAWAII

NOVEMBER 1992

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FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

HANA RANCH COUNTRY CLUB

HANA, MAUI, HAWAII

NOVEMBER 1992

Prepared For:

Keola Hana Maui, Inc.
P.O. Box 519
Hana, Maui, Hawaii 96713

Prepared By:

Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

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SECTION 1.0
EXECUTIVE SUMMARY

1.1 INTRODUCTION

Keola Hana Maui, Inc. (Keola) is proposing to develop the Hana Ranch Country Club project in Hana, Maui. This project will be an 18 hole championship golf course with a clubhouse and related facilities.

The project requires a Community Plan Amendment to the existing Hana Community Plan (July 1982) and is therefore an amendment to the existing County General Plan. Consequently, the project is subject to Chapter 343, Hawaii Revised Statutes (HRS) and Title 11, Chapter 200, of the State Department of Health (DOH), Administrative Rules.

The Maui Planning Commission determined the project may have a significant impact on the environment. Subsequently, the County filed an EIS Preparation Notice with the State Office of Environmental Quality and Control on January 15, 1992 informing the public that an EIS would be prepared for the project.

This EIS has been prepared pursuant to Chapter 343, HRS and Title 11, Chapter 200, of the State Department of Health Administrative Rules, and is intended to comply fully with the requirements of such statutes and regulations.

1.2 PROJECT DESCRIPTION

Applicant: Keola Hana Maui, Inc.

Approving Agency: Maui Planning Commission, County of Maui.

Project Location: Hana, Maui approximately 1.8 miles south of Hana town.

Tax Map Key 1-4-02: 7, 9, and 10
1-4-02: portion 4 and 8
1-4-03: 6
1-4-03: portion 5 and 9
1-4-07: portion 4

Project Area: Approximately 201 Acres

Project Description: Develop an 18-hole championship golf course for use by guests of the Hotel Hana-Maui, members of the golf course, day visitors and the resident community. A driving range and clubhouse are also planned to be constructed.

The objectives of the project are: (1) to provide a basic and necessary resort amenity-a golf course; (2) to improve the performance of the Hotel Hana-Maui relative to other luxury hotels; (3) to substantially reduce Hotel operating losses; (4) to provide stable employment for hotel employees, (5) to provide new job opportunities for Hana residents; and (6) to improve Keola's financial situation.

Owner: Keola Hana Maui, Inc.

Existing Land Uses: The project site has been primarily used for cattle ranching and pasture lands for more than 47 years.

State Land Use District: Agriculture

Hana Community Plan
Land Use Category: Agriculture

1.3 ALTERNATIVES CONSIDERED

Five alternatives to the project were considered as follows: 1) No-Action Alternative; 2) Hotel Management Alternative; 3) Agricultural Based Production Alternative; 4) Beef Production Alternative; and 5) Alternative Project Locations.

Of these alternatives, the No-Action Alternative served as the base for comparing the probable environmental effects of the project. The other four alternatives do not meet the project's objectives described in Section 3.2 and are not viable alternatives to the project. These alternatives are briefly described below.

No-Action Alternative

The implications of not developing a golf course and its effects on the Hotel Hana-Maui were studied. The Hotel is projected to incur increasingly larger losses and would not be successful in meeting the project's objectives.

Hotel Management Alternative

Various individuals and organizations have suggested that Keola could successfully increase its Hotel occupancy rates by implementing different hotel management options. PKF Hawaii (PKF) reviewed the feasibility of implementing three different hotel management strategies and concluded the strategies would not be successful in meeting the project's objectives.

Agricultural Based Production Alternative

The feasibility of converting portions of existing Hana Ranch pasture land into agriculture production such as truck crops and orchards was evaluated. However, the sales potential of these crops are restricted to the acreage required to displace imports which is very limited. This limited production potential along with transportation disadvantages make the production of alternative crops difficult to compete in the marketplace. Due to the marginal quality of soils on Hana Ranch land, most of the crops considered are also better adapted to other areas in the State. This alternative would not be successful in meeting the project's objectives.

Beef Production Alternative

The feasibility of expanding Hana Ranch's existing cattle ranching operations was evaluated. The market for Hana Ranch cattle has been firmly established and operational for many years, however, this operation has historically not been profitable. Due to disadvantages caused by high costs of grains and supplements which must be imported from the U.S. mainland, Hana Ranch's cattle operation encounters the similar decreasing comparative advantage of cattle feedlot operations in Hawaii. This alternative would not be successful in meeting the project's objectives.

Alternative Project Locations

Several alternative golf course sites on Keola owned lands were identified and investigated. These alternative sites were not selected because they did not adequately meet the six site criteria identified in Section 5.5.

1.4 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Soils and Agricultural Lands

The withdrawal of 201 acres of grazing land for the project would be offset by the reclaiming of 680 acres of brush land for grazing.

Historical trends and data of agricultural production in Maui County provide a meaningful indicator of the need for agricultural land to the island of Maui. Based on these trends, there is no indication that the 201 acres that would be converted from agriculture to golf course use would have a significant negative impact on acreage needed for crop production and grazing on Maui.

Ground and Surface Waters

Ground water in the Hana-Hamoa section of the Kawaipapa Aquifer System flows mauka to makai (eastward) from the broad interior recharge areas toward the coast. Consequently, the direction of groundwater flow in the basal aquifer underlying the project site is also mauka to makai to the coast rather than laterally to the south or north toward the basal aquifers tapped by the Hamoa and Wananalua wells, resulting in no expected contamination from chemical use on the project site.

The potential for contamination of the Hamoa and Wananalua well sources was also studied by calculating the maximum width of the zone of groundwater contribution to each well. The shape of the zone of groundwater contribution, or influence, is a parabola with the centerline coincident with the direction of groundwater flux or flow. For the Hamoa well, the maximum lateral extent on each side is equal to 421 feet, and for the Wananalua well, it is equal to 588 feet. Thus, based upon their respective 2,500 and 2,700 feet distances from the nearest boundaries of the project site, the project is not expected to affect the Hamoa and Wananalua well sources.

To further assess the potential for chemical contamination, a risk assessment study was conducted to determine the probable impacts to ground and surface waters. State-of-the art, data intensive computer simulation models were used to predict the movement of turf chemicals. The computer simulation model results show the project's effects on ground and surface waters will be well within water quality standards. In the reasonable worst case scenario (an approximation of the upper 95 percent confidence interval), pesticide concentrations at the top of the aquifer would be no greater than two percent of the lifetime Health Advisory Levels (HAL) and generally much lower. The drinking water HAL is the concentration in drinking water that could be consumed for a lifetime with no harmful effects. The expected nitrogen concentration increase in the top 5 feet of the aquifer, if the maximum amount of nitrogen is applied, would be less than 1 ppm. This is at least ten times less than the EPA allowable drinking water standard (Maximum Contaminant Level) of 10 ppm. Increases in nitrogen concentrations at the point where ground water discharges to the shoreline will probably be nondetectable. The test results also showed there will be no impacts from runoff of fertilizers, herbicides, or fungicides.

Keola will fully comply with the State Department of Health's 12 conditions applicable to new golf course developments, including the establishment of baseline ground water data and the implementation of an approved ground water monitoring plan and system.

An Integrated Golf Course Management Plan (IGCMP) has been developed and will be adhered to (Appendix E). The IGCMP is extensive and detailed, and is based on the principle of integrated pest management (IPM). IPM practice uses a variety of cultural, mechanical, biological, and chemical methods to control insect, disease, and weed pests.

Stream and Marine Environments

The project will not have significant direct impacts on existing fresh water aquatic environments because of the nature of these environments within the project area. Within the project area, fresh water habitats are mostly absent within the stream beds. The streams in the project site do not support native fresh water species nor do they appear to serve as migratory routes to perennial stream habitats in the upper reaches.

The project will not have significant direct impacts on existing nearshore marine environments. The golf course is located well inland from the shoreline, and the streams in the project area transport water to the ocean only during periods of heavy rainfall. Furthermore, the ocean is well-mixed and does not retain materials in the immediate area that might lead to long exposure or bioaccumulation in the marine food chain.

Noise

Increases in traffic noise levels attributable to the project in the year 1995 are predicted to range from 0.0 to 1.0 Ldn (Day-Night Average Sound Level) along Hana Highway and are not considered to be significant.

Aircraft noise levels will increase during the construction period due the planned use of charter aircraft services to transport construction workers to and from Hana Airport on a daily basis. However, noise sensitive properties should not be exposed to aircraft noise levels greater than 55 Ldn and should remain within the existing "Minimal Exposure, Unconditionally Acceptable" category.

Audible construction noise will probably be unavoidable during the entire project construction period. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation.

Air Quality

The primary source of potential long-term air pollution is from motor vehicle traffic related to the project. Air quality analysis results determined the carbon monoxide concentrations from project-related traffic will be well within both State and national Ambient Air Quality Standards.

Drift from the application of pesticides may occur, however, it is expected to be effectively controlled with proper equipment and application methods. Short-term air quality impacts could occur during construction activities from fugitive dust and exhaust emissions from on-site construction equipment. The State of Hawaii Air Pollution Control Regulations prohibit visible emissions of fugitive dust from construction activities at the property line and an effective dust control plan to meet these regulations will be developed.

Botanical Resources

No endemic plants, (i.e. native only to the Hawaiian Islands), occur on the site. The U. S. Fish and Wildlife Service did not officially list any threatened and endangered plants in 1989, nor did they propose or identify any candidate plants for such status in 1990 for plants in the project area. No wetlands as defined by the Corps of Engineers Wetlands Delineation Manual, published in January 1987 occur on the project site.

The project is not expected to have a significant negative impact on the botanical resources in the project area because the vegetation on the site consists primarily of pasture land and is dominated by introduced or alien plants which are of little botanical interest or concern. The golf course landscaping will incorporate as much of the existing pasture land and mixed shrubland vegetation as possible to maintain and blend in with the surrounding pasture lands.

Avifauna and Mammal Resources

The project area contains a restricted array of habitats and thus supports a limited range of fauna. No endangered species were found or would likely occur in the project area. No endangered feral mammals were recorded. No special or unique habitats, or permanent wetlands were discovered in the project area and, thus, the project will have limited impact on the fauna in the area.

Historic and Archaeological Resources

The project area has been extensively modified by commercial sugarcane and cattle operations, but scattered site remnants were located. A total of 51 sites were located, of which 23 sites are located within the project area. The locations and descriptions of these sites are presented in Section 6.9.

Keola is committed to incorporating the archaeological and historical sites located in the project area into the project whenever possible, and will continue to work closely with the Hana Community and the applicable government agencies to achieve this objective. A data recovery plan and detailed preservation plan will be developed and implemented in accordance with State Historic Preservation Office guidelines to ensure conformance with the applicable State and County requirements.

Natural Hazards

The project are is designated as an area of minimal flooding. Flooding in the general vicinity of the project is limited to the coastline where 100-year coastal flooding from wave action may occur.

In the grading of the fairways, the amount of cut and fill will be balanced. All exposed slopes and areas will be grassed immediately after grading to control and mitigate soil erosion. Other temporary erosion control measures, such as erosion control berms, will be utilized during construction.

The drainage system within the project will generally maintain the natural drainage pattern in the area. Overall on-site drainage is not expected to increase since the addition of impervious surfaces will be minimal and soil compaction from livestock will be eliminated. No increase in runoff or sedimentation in the coastal waters is expected from the project site. Impacts on water quality of the receiving waters for area runoff will be prevented or minimized by strict adherence to the types of temporary and permanent erosion control measures listed above or as specified by the Maui Department of Public Works.

Visual Resources

The clubhouse will only be visible along a short section of Hana Highway near Haneoo Road as the sloping and hilly terrain of the project site provides a natural visual buffer. In contrast, many multi-story residential estates in Hana are clearly visible from the highway.

Assessing visual changes resulting from the conversion of existing open space pasture land to landscaped terrains associated with golf courses is subjective in nature. Some individuals may view pasture land as more visually appealing than landscaped terrain, and other individuals may view landscaped terrain as being more appealing. The Maui Coastal Scenic Resources Study, however, identified several golf courses as Noteworthy Open Space Views including the Maui Country Club Golf Course and the Kaanapali Golf Course.

Socio-Economic Factors

Social Factors

The project may increase the population in Hana due to the in-migration of new full-time employees. The project may add up to 36 households which could increase Hana's population by up to 112 residents. The potential in-migration would be less to the extent that existing Hana residents working outside of Hana choose to return to work in Hana. If new employee in-migration occurs, it would exacerbate the current housing shortage.

During the construction phase, no short-term population increase will occur nor housing needed because Keola plans to fly construction workers to and from Hana on a daily basis.

The project's impacts on the Hana community and the Hana Hawaiian community are discussed in Sections 7.3 and 7.4. Adults and kupunas (seniors) of the Hana Hawaiian community expressed a strong desire to stay in Hana and to have the young people be able to live in Hana. They felt the project would help them maintain their bottom line of keeping their families together in Hana. The youth of the Hana Hawaiian community felt anything that threatened Hawaiian lands and culture was negative. Tourists were seen as being intrusive and the taking of Hawaiian land was the worst thing the golf course could do.

Social compatibility between the project and the Hana community is imperative to retain the balance and harmony of the community's lifestyle, social qualities and rural and natural environment. At the core of achieving project compatibility is the Hana community's ability and willingness to accept and/or adjust to the proposed golf course.

Keola intends to continue working with the Hana community to develop community-based programs and actions. The Hana Negotiations Committee indicates that it feels a partnership has developed between the Hana community and Keola.

Economic Factors

The proposed golf course will help the Hotel Hana-Maui offer a significantly more competitive product which will generate new room night demand and increase the Hotel's occupancy levels.

The financial projections for the combined Hotel and golf course show a positive trend of reduced losses that is expected to become net operating income by the year 2014, but the Hotel without a golf course will continue to lose large sums of money indefinitely. The earnings improvement is the result of profits generated by the golf course, and reduced Hotel operating losses with the higher occupancy rates associated with the golf course.

The golf course is expected to employ approximately 36 full-time employees for grounds maintenance, golf operations, food and beverage and administrative support. Moreover, the Hotel would be able to support its 1991 staffing levels (before the recent layoffs).

Keola predicts that it will be able to sell 1,000 corporate memberships at a sales price of $200,000 each within a one year period. The membership fees would be used to fund the costs of golf course construction ($43,000,000), repay existing debt ($132,000,000), and have $25,000,000 remaining to finance projected operating losses ($19,200,000 with the golf course).

The increased activity resulting from the proposed golf course will benefit the County of Maui and ultimately the Hana District through additional tax revenues including individual State income taxes, general excise taxes, real property taxes, and transient accommodations taxes.

Water Supply

The project may increase potable water demand up to 51,600 gallons per day (gpd) due to clubhouse facilities and additional households. This withdrawal will not have an adverse impact on the Kawaipapa Aquifer System which has an estimated sustainable yield of 48 million gallons per day (mgd). Seven wells have been drilled in this aquifer system and altogether they have an installed pump capacity of 1.5 mgd and currently use less than 1.0 mgd, or 2 percent, of the sustainable yield.

The non-potable irrigation requirement for the proposed golf course is estimated to average 70,000 gpd, with a maximum month requirement of 100,000 gpd. Keola plans to restore and utilize an existing five acre catchment reservoir that will have a storage capacity of 13 million gallons and supply an estimated average of 91,000 gpd.

Wastewater Treatment and Disposal

A packaged aerobic treatment plant and leaching field system is proposed to handle the wastewater from the clubhouse, and septic tanks will be utilized for the comfort stations along the golf course. Keola will be responsible for installing and maintaining the aerobic treatment system and septic tanks.

Solid Waste Disposal

Up to 1.60 tons per day (tpd) of solid waste may be generated by clubhouse activities and additional households and can be accommodated at the Hana Landfill. Organic wastes generated by maintenance and landscaping activities for the golf course will be used for mulching and composting purposes. A compactor for bulk waste is also planned to be used to further reduce land fill loads.

Transportation Facilities

The project should have minimal impact on traffic flow at the intersection of Hana Highway with Haneoo Road/Project Access Road when the project is completed by 1995.

Electrical Systems

The total electrical demand for the project is estimated to be approximately 400 kilowatts (kw). If the project's 400 kw power requirement is added to the current peak demand of 1,300 kw, it would exceed Maui Electric Company's existing substation capacity by 200 kw. Maui Electric Company has plans to expand the capacity of the Hana substation to approximately 2,000 kw in 1992, if funds are available.

Police and Fire Protection Services

The project is not expected to affect County police and fire protection services in Hana.

Educational Facilities

The project is expected to have minimal impacts on Hana High and Elementary School.

Health Care Facilities

The limited medical staff at Hana Medical Center (HMC) makes it difficult to accommodate the present and future patient demands for family medical services. The project may add from one to two patients a day requiring family medical services at HMC.

Recreational Facilities

The project will affect one of the hunting trails, however, Keola will continue to provide access for authorized residents by establishing a new route after the final layout of the golf course is determined.

Beach parks, camping and fishing activities, and other recreational facilities are not expected to be significantly impacted by the project.

1.5 COMPATIBILITY WITH LAND USE PLANS AND POLICIES

The project supports and is compatible with the objectives and policies of the Hawaii State Plan, the State Functional Plans, the Hawaii Coastal Zone Management Act, the Office of State Planning's recommendations for golf courses and land use districts, the General Plan of the County of Maui, and the Hana Community Plan that are related to the project.

Economic objectives are achieved by the creation of short and long-term employment opportunities for residents of Hana and Maui. Visitor industry objectives are supported by providing a basic resort amenity that will enable the Hotel Hana-Maui to compete more effectively with other luxury resorts in Hawaii.

Land and water resources will be properly managed to avoid adverse environmental impacts. No rare or endangered plant and animal species are located on the project site. The project area has been surveyed, and historic and archaeological sites identified. A Historic Sites Mitigation Plan will be prepared in compliance with applicable State and County requirements.

The natural beauty of Hana will be complemented by the the low density, open space character of the golf course. Existing access to mountain and shoreline areas will be preserved, while a new recreational activity will be added for current and future residents.

The 201 acres that would be converted from agriculture to golf course use is not expected to have a significant negative impact on acreage needed for crop production and grazing on Maui. County and State facilities and services are not expected to be significantly affected.

1.6 SUMMARY OF UNRESOLVED ISSUES

During this EIS process, Keola has been working closely with the Hana community and agencies to assure their concerns are incorporated into the design of the project to the extent possible. Keola has held meetings with the Hana Negotiations Committee and Community Association to discuss their concerns, and has made themselves available to discuss any questions or concerns the may have. Major issues and concerns expressed have been addressed and discussed in the Final EIS. Consequently, there are no unresolved issues presently identifiable at this time.

Keola has and will continue to work with the Hana community. However, should any issues arise, Keola will attempt to resolve them as they have done on previous occasions. This would include discussions with the community or government agencies to clarify concerns and issues along with potential solutions that are agreeable to both parties to the extent possible.

1.7 LISTING OF REQUIRED PERMITS AND APPROVALS

<u>State</u>	
Department of Health	NPDES Permit
<u>County of Maui</u>	
Planning Department	Hana Community Plan Amendment
	Zoning Change
Department of Public Works	Grading Permit
Building Department	Building Permit

SECTION 2.0
ENVIRONMENTAL SETTING

2.1 HISTORICAL BACKGROUND

Commercial sugar cane production began in Hana in the 1850's. In 1944, Mr. Paul I. Fagan purchased the Kaeleku Sugar Company, Ltd. from C. Brewer & Co., Ltd. Due to the declining sugar industry, Mr. Fagan decided to discontinue sugar operations, convert the crop lands into ranch lands, and to construct a hotel. The Hotel Hana-Maui was completed in 1946.

The ownership of Hana Ranch, Inc. has changed five times since 1944. In 1989, Keola Hana Maui, Inc. (Keola) became the fifth owner when it purchased Hana Ranch, Inc., including the Hotel Hana-Maui from Rosewood Corporation. Today, Keola is the largest employer and landowner in the Hana region. The Hotel Hana-Maui, for example, employs about one fourth of Hana's available workforce. In addition, Keola operates a ranch and store which also employ Hana residents. The ranch is primarily a breeding operation. There are three herds, consisting of approximately 1,650 breeding cows, 600 branded calves, 670 replacement heifers, and 66 bulls.

Keola owns approximately 5,140 acres of land. These lands are generally divided into the following categories: pasture - 2,920 acres, Hotel Hana-Maui - 30 acres, Ranch Center (commercial) - 22 acres, forest reserves - 1,330 acres, single family residences - 88 acres, conservation (shoreline) - 60 acres, and brush - 690 acres.

2.2 LOCATION

Maui is the second largest island in the State of Hawaii and is located to the southeast of Oahu and to the northwest of Hawaii. The land area of the County of Maui is 1,175 square miles, including 21 square miles of urban area (places with populations 2,500 or more) and 1,154 square miles of rural, agricultural and conservation areas (places with populations less than 2,500 and open country).

The Hana region is located on the windward coast of Maui at the eastern extremity of the island. It lies on the lower eastern slope of Haleakala which rises to more than 10,000 feet just a few miles to the west. The Hana region encompasses approximately 100,000 acres including: Hana, Keanae, Wailua, Kipahulu and Kaupo, and scattered small rural settlements. The major population center of the region is located within the Hana area. Access to Hana is limited to vehicles traveling 44 miles from Kahului on a narrow and winding Hana Highway or by commuter air service at Hana Airport provided by Aloha Island Air.

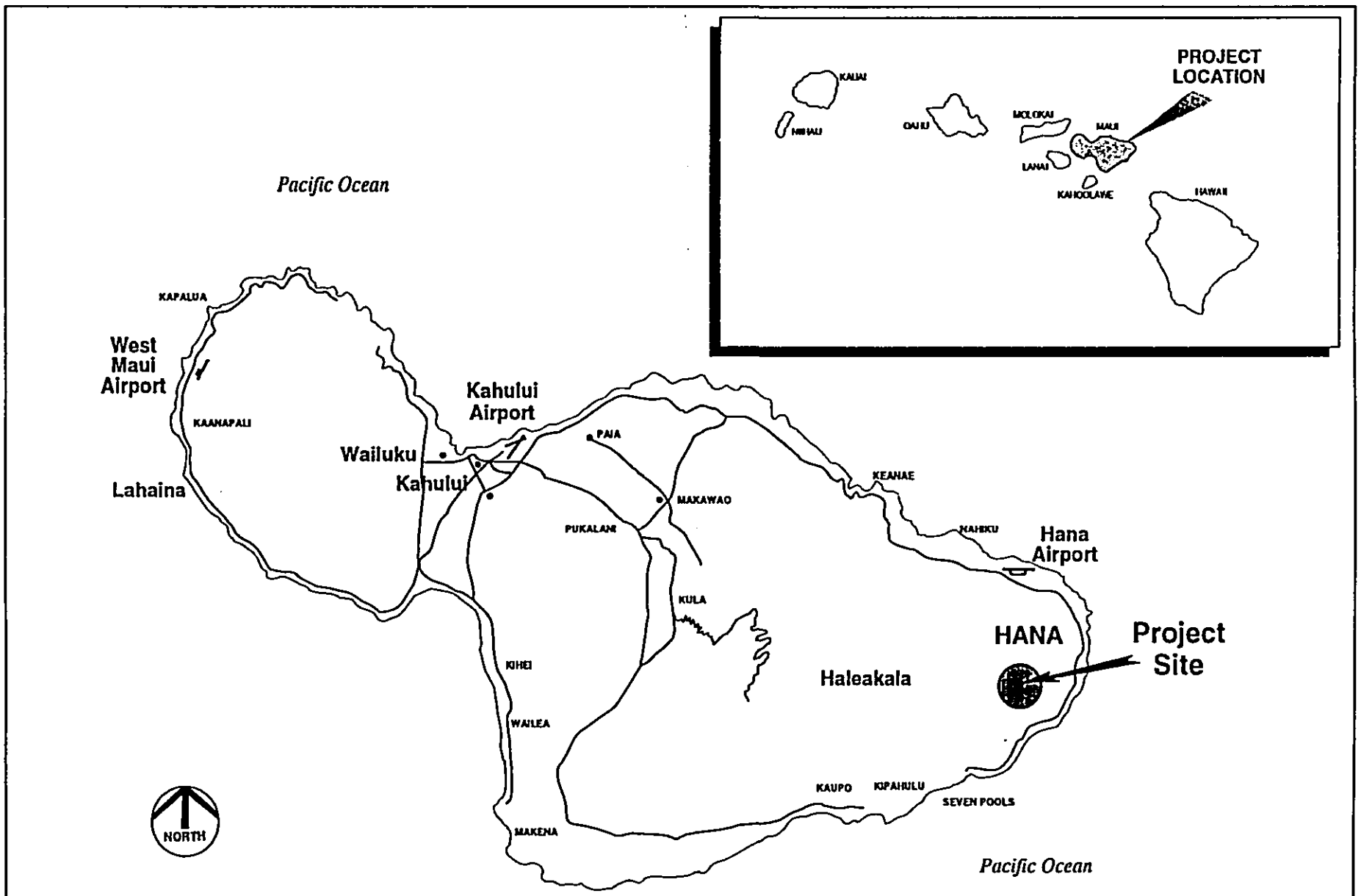
2.2.1 PROJECT LOCATION AND SITE

The proposed Hana Ranch Country Club project is located in the district of Hana, Maui, and is shown in Figure 2.2.1. The project site is located mauka of Hana Highway approximately 1.8 miles from the Hotel Hana-Maui in Hana Town, and will encompass approximately 201 acres.

2.3 EXISTING AND SURROUNDING LAND USES

Presently, the project site and surrounding area is used as pasture land for Hana Ranch cattle operations. Figure 2.3.1 shows the project site and surrounding uses in the immediate vicinity. Before World War II, the lands surrounding Hana, including the project area, were used for sugar cane cultivation. Today, agricultural zoned lands in the Hana area are used primarily for grazing. According to Hana Ranch personnel, for the past 47 years, the primary use of the project area has been for cattle pasture lands.

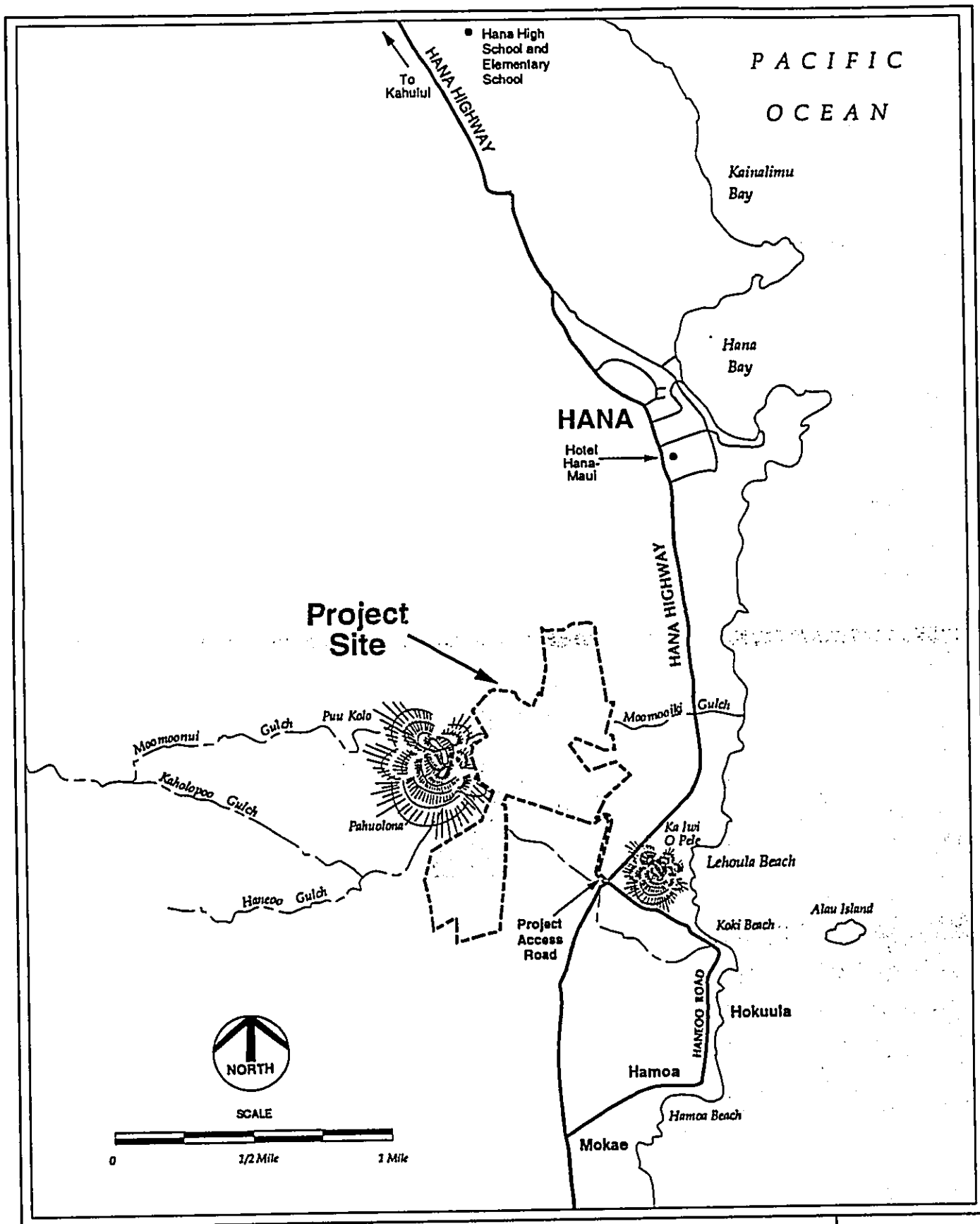
Immediately north and south of the site are existing pasture land and brush. Mauka (west) of the project site are the cinder cones Puu Kolo and Pahuolona while further mauka are the rainforests of the Hana Forest Reserve. Immediately makai (east) of the site is Hana Highway with Puu Ka Iwi o Pele located directly across this highway. Further south of this site near the coastal areas are various residential homes and small-scale agricultural activities.



PACIFIC PLANNING & ENGINEERING, INC

PROJECT LOCATION MAP

Figure 2.2.1



PACIFIC PLANNING & ENGINEERING, INC

Project Vicinity Map

Figure 2.3.1

2.3.1 STATE LAND USE DESIGNATIONS

The project site and surrounding area is currently designated as an Agriculture District by the State Land Use Commission. The Hana Forest Reserve located mauka of the site is designated Conservation along with Puu Ka Iwi o Pele located across Hana Highway. Existing State land use districts in the area are shown on Figure 2.3.2. Golf courses are currently permitted activities in Agricultural Districts provided that they are not located within lands with soil classified by the Land Study Bureau as "A" or "B."

2.3.2 COMMUNITY PLAN LAND USE DESIGNATIONS

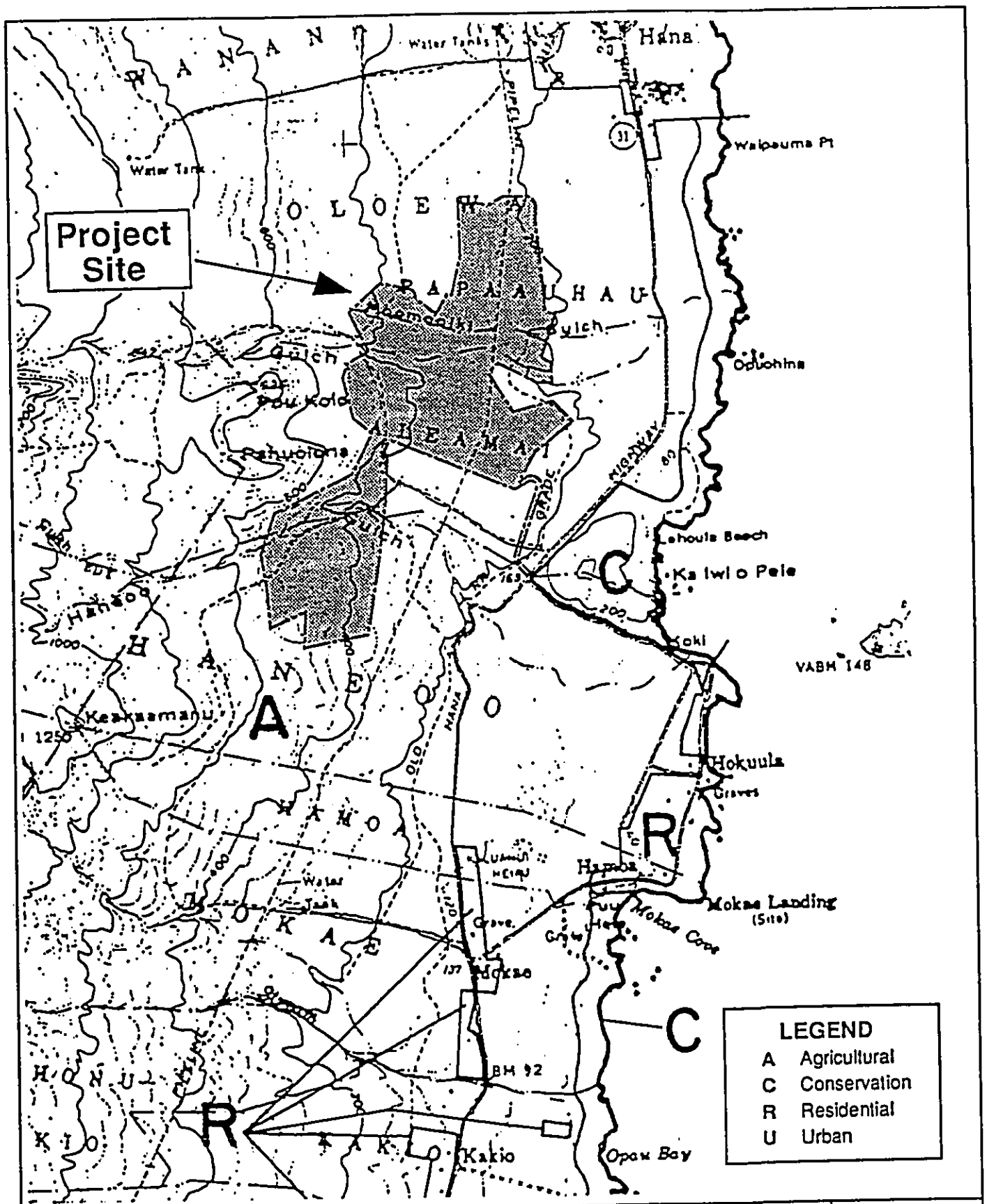
The Hana Community Plan (July 1982) has designated the project site and surrounding area Agricultural. This land use designation indicates areas for agricultural activity which would be in keeping with the economic base of the County and the requirements and procedures of Chapter 205, HRS. Presently, this community plan is being revised in accordance with the recent update of Maui's General Plan. Existing land use designations in the Hana Community Plan are shown on Figure 2.3.3.

Golf course activities are not permitted uses under the current Agriculture designation, therefore, a Community Plan Amendment for the project will be required to change the site's land use designation to Park. This designation applies to lands developed or to be developed for recreational use and includes all public and private active and passive parks. A PK-4 zoning would be specifically required for the golf course project.

2.4 LAND OWNERSHIP

Since the preparation of the Environmental Assessment, the project boundaries were revised to exclude all lands where land ownership was questioned or State or ceded lands. The entire project site is owned by Keola and is located on the following tax map key parcels:

1-4-02: 7, 9, and 10
1-4-02: portion 4 and 8
1-4-03: 6
1-4-03: portion 5 and 9
1-4-07: portion 4

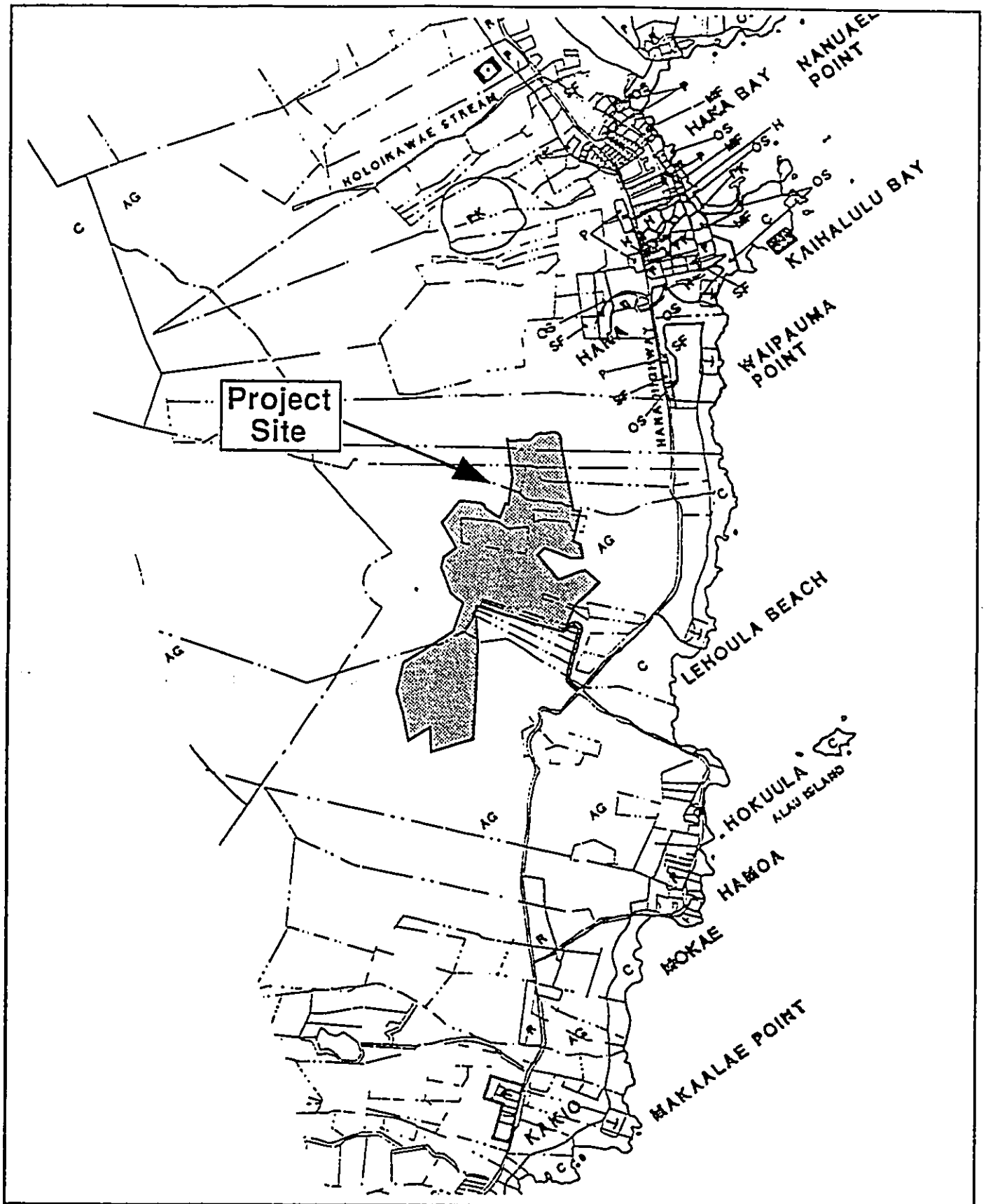


PACIFIC PLANNING & ENGINEERING INC.

Source: State Land Use Commission District Map M-16

State Land Use District Map

Figure 2.3.2



PACIFIC PLANNING & ENGINEERING, INC Source: Hana Community Plan	Hana Community Plan Land Use Designations Map	Figure 2.3.3

SECTION 3.0
PROJECT NEED AND OBJECTIVES

As the largest employer and landowner in the Hana region, the economic stability of Keola is very important to the region. Keola employs about one fourth of Hana's available workforce at the Hotel Hana-Maui, and also employs a sizable number of other residents for its ranch operations and other commercial businesses.

In addition to the current economic slowdown, the Hotel Hana-Maui is facing increasing competition from other luxury hotels and has been forced to implement layoff of its full-time and part-time employees. The Hotel's lower performance relative to other luxury hotels, the importance of the Hotel's viability to the Hana community, the need for employment stability in Hana, and the need to improve Keola's financial situation are the principal reasons the proposed golf course is needed.

PKF Hawaii's (PKF) report on the market feasibility and economic impact of the proposed golf course and the Hotel Hana-Maui is summarized below, in Sections 5.1, 5.2, 7.5 and 7.6, and included in its entirety in Appendix B.

3.1 PROJECT NEED

3.1.1 HAWAII'S LUXURY HOTEL MARKET

In the distant past, such hotels as the Royal Hawaiian in Waikiki were considered to be luxury hotels, but these have been surpassed by hotels offering more extensive services, amenities and seclusion. During the recent past, the luxury market has been dominated by three hotels: the Kahala Hilton on Oahu, the Hotel Hana-Maui on Maui, and the Mauna Kea Beach Hotel on the Island of Hawaii. From the late 1970's and up to the present day, however, new luxury hotels have opened to add competition and redefine the meaning of a luxury hotel.

Over the years, hotels have become increasingly segmented resulting in subclassifications of hotel categories. Within the Hawaii luxury market, two major segments have evolved and are typically referred to as primary and secondary luxury class hotels. Although factors distinguishing a primary from a secondary luxury hotel are not clearly defined, primary luxury hotels generally offer a higher level of service, fewer, but larger rooms and provide an atmosphere of tasteful elegance. Secondary luxury properties tend to be larger with higher densities and "flashier" facilities.

There are currently 16 primary and 8 secondary luxury hotels that represent the luxury hotel market in the State. These properties are competitive based on their location within resort areas of Hawaii, reputation, rate structures and facilities offered.

While the Hotel Hana Maui will compete to a certain extent with all luxury hotels throughout Hawaii, the Hotel will have a special competitive relationship with the primary luxury properties. Like the Hotel Hana Maui, these properties are high-end luxury properties with well-established reputations. These hotels include the: Four Seasons Wailea, Halekulani, Kahala Hilton, Kapalua Bay, Kona Village, Lodge at Koele, Maui Prince, Mauna Kea Beach, Mauna Lani Bay, Ritz-Carlton Mauna Lani, Royal Hawaiian, Sheraton Moana, and Stouffer Wailea Beach, Manele Bay, and the Sheraton Princeville. Including the Hotel Hana-Maui, these 16 primary luxury hotels total 4,996 rooms.

In 1991, the total primary luxury market achieved an average occupancy of 62 percent and an average daily rate of $230. Occupancy at individual properties ranged from 35 percent to 83 percent, while individual property average rates ranged from a low of $126 to a high of $315. These properties were deemed most competitive on the basis of target markets, product positioning, reputation as resort properties, rate structures, number of rooms, and the facilities and amenities offered.

In addition to the existing primary luxury supply, the following luxury, full-service hotel properties have either been recently completed, are under construction, or have a high probability of being built:

- Ritz-Carlton Kapalua, Maui
- Four Seasons Kaupulehu, Hawaii
- Hapuna Beach Prince, Hawaii
- Hotel Ihilani Resort and Spa, Oahu
- Four Seasons Ko Olina, Oahu
- Kawela Bay Hotel II, Oahu
- Regent at Kohanaiki, Hawaii

3.1.2 MARKET POSITION OF THE HOTEL HANA-MAUI

The Hotel Hana-Maui is a prestigious luxury resort located in the town of Hana on the southeastern coastline of Maui. The resort consists of 56 guestrooms, 40 seaside cottages, and a plantation home rental. The resort offers tennis facilities, a wellness center, two swimming pools, escorted wellness and cultural walks, Hamoa beach facilities, cookouts, and horseback riding activities for its guests.

Hotel Hana-Maui has traditionally been oriented to the rest and relaxation segment of the luxury market and, therefore, guest activities have been comparatively minimal. The resort's principal market has been independent luxury travelers including celebrities and public figures who wish to experience a more peaceful and secluded experience. The secluded and exclusive ambiance is enhanced by the limited access available by the narrow and winding 44 mile Hana Highway or by infrequent commuter air service.

From its opening in 1948 through the mid-1980's, the Hotel Hana-Maui experienced occupancy and average daily rates equal to or greater than those achieved by the Hawaiian luxury market as a whole. During those years, the Hotel Hana-Maui established itself as a premier destination resort for wealthy travelers who wanted a secluded and luxurious resort environment.

The mid-1980's, however, brought the addition of several new luxury hotels which increased the State's inventory of primary luxury hotel units by 45 percent from 2,069 units in 1982 to 3,006 units in 1986. With a full complement of recreational facilities, these new hotels were well-positioned to meet the needs of the luxury traveler. Of particular importance is the fact that each of these new resorts had either its own golf course, or had preferred privileges at a nearby resort course. Several of these resorts have more than one golf course for its guests' use.

PKF analyzed the Hotel Hana-Maui's market position, and calculated the hotel's "market share index", which represents the ratio of market demand that the Hotel captured as a percentage of its "fair market share". Fair market share assumes that a hotel will receive the same percentage of the competitive demand as is represented by its percentage of available supply in the competitive market. A hotel with competitive advantages will achieve a market penetration in excess of 100 percent of fair share, while competitive weaknesses will be reflected in penetrations of less than 100 percent of fair share.

PKF determined the Hotel Hana-Maui consistently garnered more than its fair share of room night demand, achieving market penetration rates well over 100 percent prior to 1986. The significant additions to supply in the mid-1980's, however, resulted in decreased occupancy rates for both the primary luxury market as a whole and the Hotel individually. While subsequent years saw a rebound for the luxury market to pre-1984 occupancy levels, the Hotel never fully regained its market share. Since 1986, the Hotel's market penetration has dropped below the 100 percent, fair share mark. In 1991, for example, the Hotel captured only 74 percent of its fair share of the available room night demand in the primary luxury market.

These marginal penetration rates correspond to occupancy rates of five to twenty percentage points below the primary luxury market average. The Hotel Hana-Maui is now experiencing its lowest occupancy rates in over twenty years because of its inability to compete with other luxury resorts due primarily to its lack of significant recreational facilities, meeting space and limited number of rooms.

Table 3.1.1 summarizes the historical occupancy and average daily room rates for the Hotel Hana-Maui and the primary luxury market since 1977.

Table 3.1.1.
Historical Occupancy and Average Daily Rates
For the Hotel Hana-Maui and the Primary Luxury Market

	Number	Luxury Market		Hotel Hana-Maui	
Year	of Hotels	Occupancy (%)	Ave. Rate	Occupancy (%)	Ave. Rate
1977	6	87	$75	87	$69
1978	8	89	$84	89	$74
1979	8	83	$99	83	$82
1980	8	74	$103	80	$86
1981	8	76	$131	79	$91
1982	8	71	$151	77	$102
1983	10	68	$163	66	$108
1984	10	62	$158	58	$115
1985	10	68	$161	57	$108
1986	12	78	$162	69	$168
1987	12	72	$185	70	$202
1988	12	68	$196	62	$255
1989	12	67	$214	54	$258
1990	15	67	$230	44	$254
1991	16	62	$230	46	$254

Source: PKF Hawaii

Historically, the Hotel Hana-Maui has catered almost exclusively to the free independent traveler (FIT) market. It is possible the Hotel could attract small corporate retreats or incentive groups, however, without additional group and meeting facilities, the market orientation is expected to remain relatively unchanged in the future.

Regarding the decline in Hotel Hana-Maui's occupancy rates, PKF concluded that "Key reasons for this decline are the significant increase in luxury hotel rooms in Hawaii; additional competitive secluded hotels such as the Lodge at Koele, Manele Bay Hotel and Princeville Hotel; new resort destinations, such as Wailea with its critical mass of hotels, amenities and activities; the changing visitor demographic trends and travel patterns; and the lack of an activity oriented experience, such as golf." Numerous market research studies have indicated a shift in the luxury market to a more activity-oriented market that expects more guest activities and amenities. Combined with the increase in other destination resorts that offer a similar exclusive experience, but with more guest activities, the performance of the Hotel Hana-Maui has declined significantly.

New resort developments and expansion plans for existing resorts must consider a golf course as a necessary amenity, no different from a swimming pool, tennis courts and fitness facilities. A golf course is viewed not so much from a standpoint of creating a profitable operation in and of itself, but for the purpose of creating an overall successful and profitable resort. The availability of golf at a resort not only increases its hotel room occupancy level, but also revenues at all related facilities, including food, beverage and retail sales.

The popularity of golf has increased at a fast rate, particularly with the affluent segment of the population as they pursue a more active lifestyle. It is this same affluent group of people that patronize luxury hotels and resorts. Consequently, luxury resorts that do not provide golf are at a serious competitive disadvantage to those that do. The addition of a championship golf course will allow the Hotel Hana-Maui to become more competitive within the primary luxury hotel market.

The belief that resorts need golf courses is shared by other resort operators. A Business Week[1] article on the growing golf industry cited National Golf Foundation estimates that 7 million golfers took a golf trip in 1988 and spent a total of $7.8 billion on travel and lodging. In that article, a Marriott Corp. (the largest golf resort operator) Vice-President stated "There's no question that golf has raised our occupancy levels," and Hyatt's President said "We simply would not build a resort without golf today."

3.1.3 KEOLA'S FINANCIAL POSITION

In addition to absorbing the operating losses incurred by the Hotel Hana-Maui, Keola is obligated to repay its outstanding loans and interest, and cash advances from its parent company. In 1992, the Hotel is projected to incur an operating loss of $2,711,000, while the ranch and other businesses may generate a very small profit. Keola's existing debt is approximately $83,000,000 plus interest. In addition, cash advances from its parent company are expected to amount to $49,000,000 by the end of 1993.

Continuing operating losses or marginal profits will not generate sufficient funds for Keola to repay its total debt of $132,000,000. The proposed golf course is expected to increase Hotel occupancy, to substantially reduce Hotel operating losses, and will enable the sale of international corporate golf memberships. The golf membership proceeds would be used to fund the costs of golf course construction, all existing debt (including cash advances from Keola's parent company), and finance future operating losses.

3.2 PROJECT OBJECTIVES

The objectives of the project are: (1) to construct a golf course; (2) to improve the performance of the Hotel Hana-Maui relative to other luxury hotels; (3) to substantially reduce Hotel operating losses; (4) to provide stable employment for hotel employees, (5) to provide new job opportunities for Hana residents; and (6) to improve Keola's financial situation.

---

1 "The Boom In Golf As Baby Boomers Hit The Links," Business Week, March 27, 1989.

The golf course will provide golfing opportunities for the guests of the Hotel Hana-Maui, golf course members, day visitors and the resident community.

The Hotel Hana-Maui is currently experiencing its lowest occupancy rates in over twenty years, with occupancy rates that are five to twenty percentage points below the primary luxury market average. The golf course would provide the activity oriented experience and basic amenity that many guests are seeking, and enable the Hotel to be more competitive with other Hawaii luxury resorts. PKF estimates the golf course would increase the Hotel Hana-Maui's occupancy rates from 55 percent to 75 percent within four years of the golf course opening.

The increased occupancy rates (and concurrent increases in average daily room rates) would improve the combined Hotel and golf course financial performance by decreasing annual losses, and eventually becoming profitable. The combined Hotel and golf course operations are projected to have an aggregate operating loss for the twelve year period 1992-2003 ($19,200,000) that would be $13,200,000 less than the aggregate operating loss for the Hotel without a golf course ($32,400,000).

The increased occupancy rates and reduced operating losses would enable Keola to maintain steady employment for its Hotel workers. In addition, the golf course would provide new, full-time employment opportunities for approximately 36 Hana residents.

In addition to the above expected financial and employment effects, the golf course will enable the sale of international corporate golf memberships. The estimated golf membership proceeds of $200,000,000 would be used to fund the costs of golf course construction ($43,000,000), all existing debt ($132,000,000), and have a balance of $25,000,000 to finance projected operating losses for the next 12 years ($19,200,000 with the golf course).

SECTION 4.0
DESCRIPTION OF THE PROPOSED PROJECT

4.1 GOLF COURSE AND SUPPORT FACILITIES

The project is to develop a golf course to service the guests of the Hotel Hana-Maui, golf course members, day visitors and the resident community. Support facilities for the golf course include a clubhouse, maintenance facilities and a driving range. There are no plans to increase the number of guestrooms or cottages at the Hotel Hana-Maui, nor to construct luxury homes or condominiums around the golf course.

4.1.1 GOLF COURSE

The Hana Golf Course is envisioned to be an 18 hole championship golf course. The golf course will be semi-private and open to the guests of the Hotel Hana-Maui, members of the Hana Ranch Country Club, day visitors and the resident community. A preliminary golf course concept plan measuring approximately 6,930 yards is shown on Figure 4.1.1. The approximate size of the playing areas are as follows: fairways - 60 acres, tees - 3 acres, and greens - 5 acres.

The golf course will only be operated during daylight hours. Approximately 150 parking spaces will be constructed for users of the golf course, clubhouse and driving range facilities.

Although green fees have not been formulated for the different proposed users, Keola intends to offer "Kamaaina" rates to Hawaii residents and charge market rates to hotel guests and day visitors.

Figure 4.1.1 Hana Ranch Country Club Concept Plan

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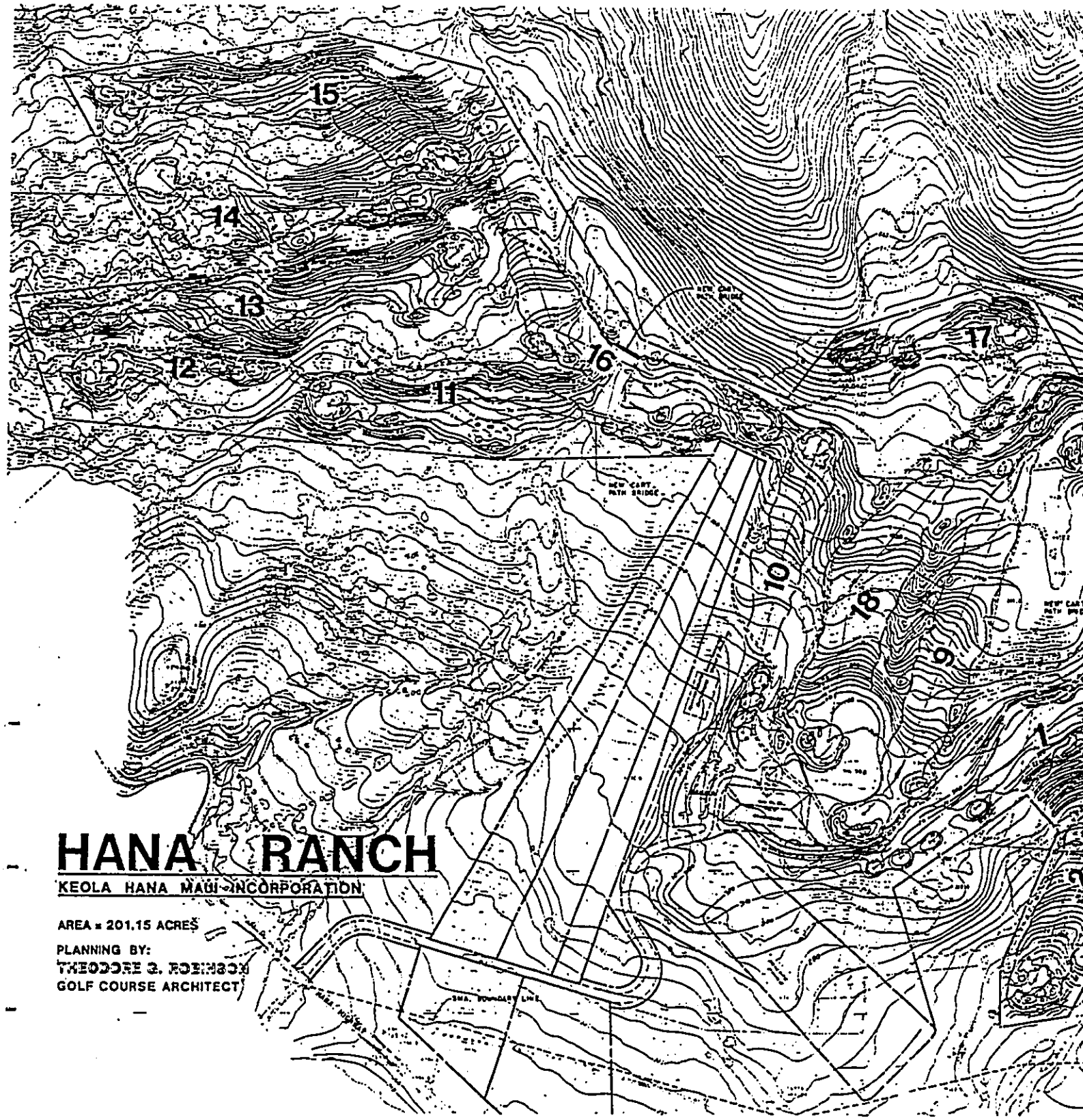
15
14
13
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16
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1
HANA RANCH
KEOLA HANA MAUI INCORPORATION
AREA = 201.15 ACRES
PLANNING BY:
THEODORE J. ROBINSON
GOLF COURSE ARCHITECT
PACIFIC PLANNING
Source: Ted G. Robinson, Golf Course Architect
HANA RANCH COUNTRY CLUB CONC

XEROX COPY

Y CLUB CONCEPT PLAN	Figure 4.1.1

4.1.2 CLUBHOUSE

The clubhouse concept has been completed. The general location of the clubhouse is shown on Figure 4.1.1. The clubhouse is expected to be a two story building, approximately 250 long and 80 feet wide. It is anticipated that the clubhouse will include the following types of facilities: pro shop, golf course administrative offices, full service restaurant, lounge (bar), meeting rooms, snack shop, kitchen, locker facilities, and golf cart storage areas.

The approximate areas for the different facilities are listed in Table 4.1.1. The clubhouse (39,900 square feet) includes 5,500 square feet of meeting rooms and 4,600 square feet of golf cart storage space.

The clubhouse will be open to the guests of the Hotel Hana-Maui, members of the Hana Ranch Country Club, day visitors and the resident community. The restaurant will be able to accommodate about 200 persons, and is scheduled to be open to the public seven days a week.

4.1.3 DRIVING RANGE

A driving range will be operated in conjunction with the golf course. The size of the driving range is approximately 6 acres. The hours of operation for the driving range will be the same as the golf course, which will be only during daylight hours.

The driving range will be open to the guests of the Hotel Hana-Maui, members of the Hana Ranch Country Club, day visitors and Hawaii residents.

Table 4.1.1. Preliminary Clubhouse Facilities

Facilities	Square Feet
Lobby / entry	1,000
Pro shop	2,700
Administrative offices	500
Restaurant	3,750
Lounge (Bar)	800
Meeting rooms	5,500
Mixed grill	2,200
Snack shop	450
Kitchen	3,500
Rooms for reading, etc.	900
Men and women lockers	4,300
Bag room	800
Golf cart storage	4,600
Restrooms	1,000
Laundry, maintenance, utilities, etc.	1,450
Circulation	6,450
Total	39,900

Source: Kober / Hanssen / Mitchell Architects

4.2 CONSTRUCTION SCHEDULE, PLAN AND ESTIMATED COST

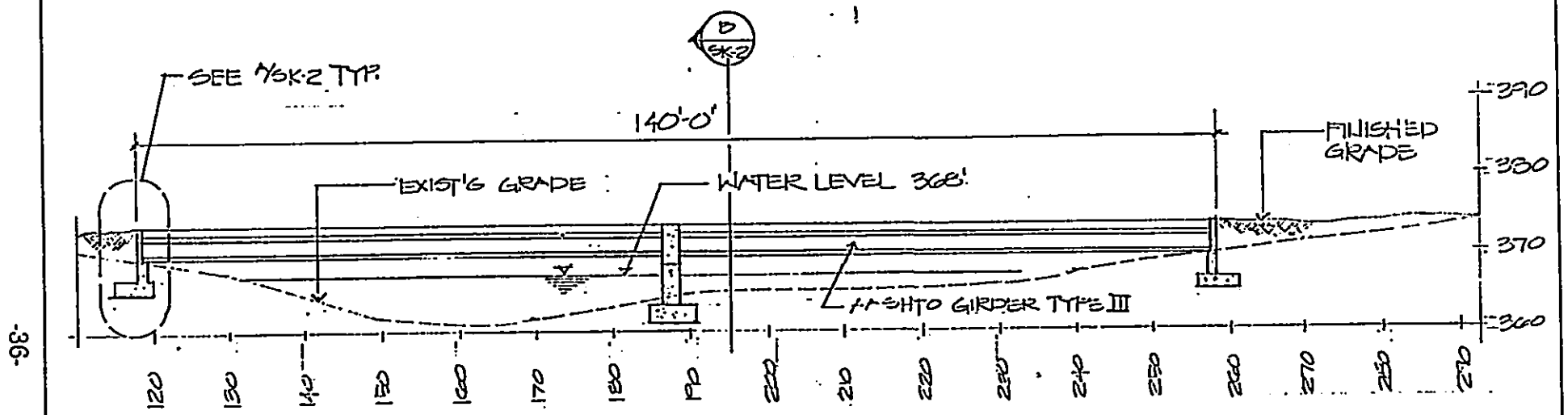
After the Community Plan Amendment is obtained along with various other permits and approvals, construction is planned to start in late 1993 and be completed in 1995. The preliminary estimated cost for construction of the golf course and clubhouse is $43,000,000. The estimated construction cost of the golf course is $35,000,000, and the clubhouse is $8,000,000.

During the peak construction period up to 146 construction workers may be required. It is estimated that 10 percent of the total construction workforce will come from the Hana community. The other non-Hana construction workers (90 percent) are planned to be flown in and out of Hana each day. The workers would fly to and from Hana Airport using chartered DHC-6 (Twin Otter) and/or DHC-7 (DASH 7) type aircraft in the early morning and in the evening. The number of flights per workday would vary from two DHC-6 flights during the initial phases of the construction, to a maximum of six DASH 7 flights during the middle and later phases of construction. A total of three to twenty-four van trips per workday would be required to transport workers between Hana Airport and the project site. As a result of this construction employee transportation program, housing for construction workers will not be required. The only temporary facilities required will be offices, equipment maintenance facilities and storage facilities.

Figure 4.2.1 is an illustration of the preliminary golf cart bridge elevations and Figure 4.2.2 presents preliminary golf cart bridge structural sections.

4.3 USE OF PUBLIC FUNDS OR LANDS

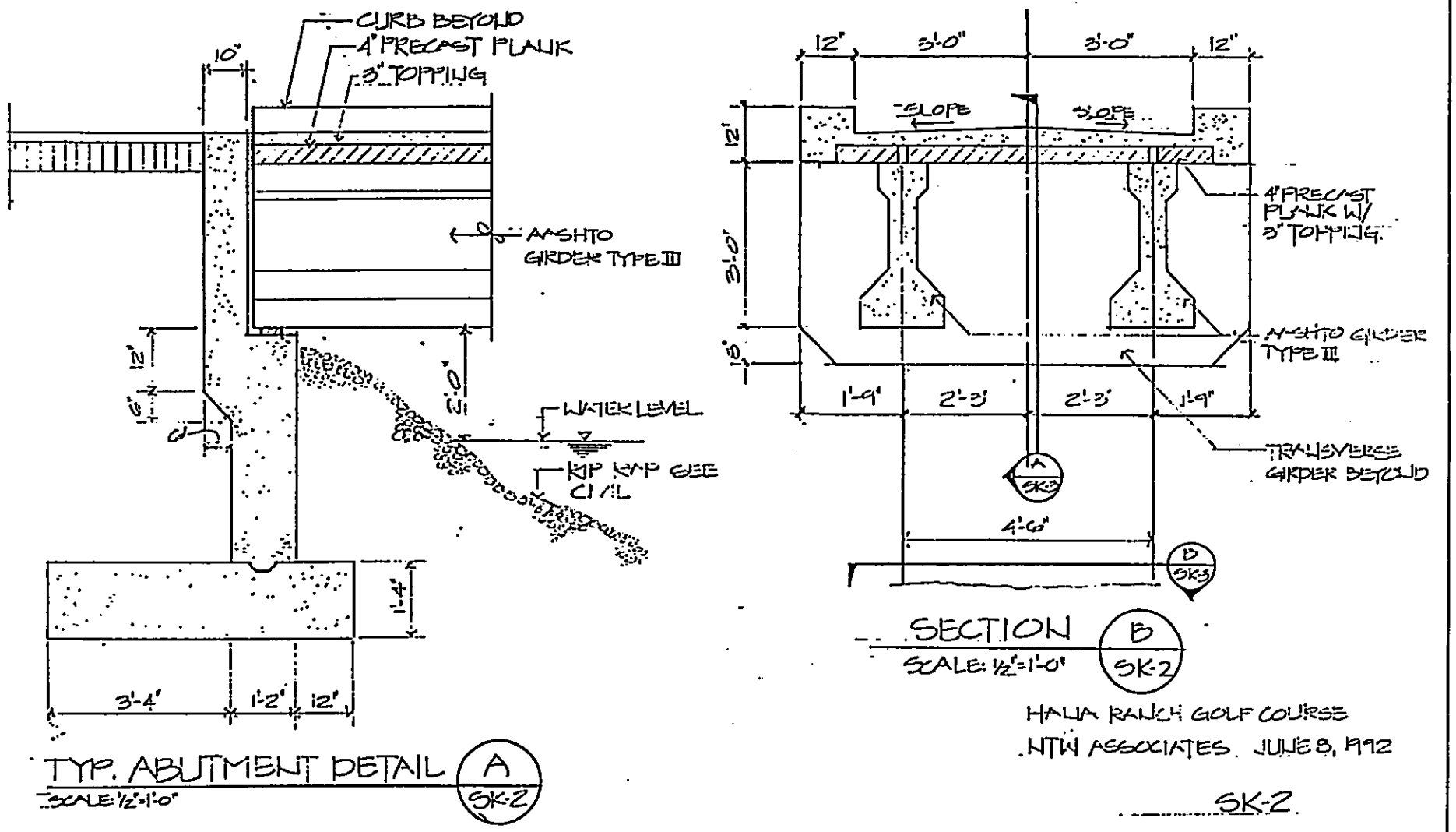
The project will not include the use of any public funds or lands. The entire project site is privately owned by Keola and the project will be funded by Keola.



GOLF CART BRIDGE ELEVATIONS

SCALE: 1/16"=1'-0"

PACIFIC PLANNING & ENGINEERING, INC Source: Ronald M. Knoll Corporation	PRELIMINARY GOLF CART BRIDGE ELEVATIONS	Figure 4.2.1



PACIFIC PLANNING & ENGINEERING, INC

Source: Ronald M. Knoll Corporation

PRELIMINARY BRIDGE TYPICAL ABUTMENT DETAIL AND SECTION VIEWS

Figure 4.2.2

SECTION 5.0
ALTERNATIVES TO THE PROPOSED PROJECT

Five alternatives to the project were studied. These alternatives included taking no action, implementing hotel management options, growing agricultural crops, increasing beef production, and using a different project location. These alternatives do not meet the project's objectives described in Section 3.2 and are not viable alternatives to the project.

The results of PKF's study of the implications of not developing the project is discussed in Section 5.1, and different hotel management options is summarized in Section 5.2. The results of Mr. Frank S. Scott, Jr., PhD study of the feasibility of converting pasture land into agricultural production of truck crops, orchard crops, bananas, sugarcane, and flowers and foliage is presented in Section 5.3, and the feasibility of expanding Keola's beef production is described in Section 5.4. A review of alternative project locations is discussed in Section 5.5.

5.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, a golf course would not be developed and the project area would continued to be used as pasture land for cattle operations.

PKF analysis indicates that without the golf course and with the extremely high competition in the primary luxury market, which includes newer facilities, more amenities, less isolated locations and discounted pricing, it is highly unlikely that the hotel will attain the high occupancy levels that it enjoyed through 1982. Although occupancy can probably be increased over current levels, it most likely will not exceed a stabilized occupancy rate of 60 percent.

Based on the projected 60 percent occupancy, an average of 58 rooms per day would be occupied. Although the industry guideline is approximately 2.0 employees per occupied room, 2.5 employees was used due to the small number of rooms in relation to the size of the grounds. This would equate to 145 full-time employees as compared to the existing 216 equivalent full-time employees. The implication is an over staffing of 71 full-time personnel. Large reduction in employees could negatively impact the class of operation and affect the hotel's market position and image. The potential negative impacts to the Hana area from the reductions in personal income would be compounded by the need for increased social and economic assistance if the employees were unable to find comparable employment.

In the event that staff reductions and other cost reduction measures were unsuccessful, economic actions could include selling all of the company's assets, or portions of assets (ex. parcels of land) to achieve financial return objectives. The sale of part or all of Keola's assets could result in more landowners which would increase the potential and options for development.

The Statement of Estimated Annual Operating Results for the twelve year period 1992-2003 is presented in Table 5.1.1. The table shows a projected aggregate operating loss for the twelve year period of $32,400,000 with increasing losses each year. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

Table 5.1.1
Statement of Estimated Annual Operating Results Without Golf Course, 1992 - 2003

WAILEA MANA MAUI
MANA, MAUI, HAWAII
STATEMENT OF ESTIMATED ANNUAL OPERATING RESULTS WITHOUT GOLF COURSE
STATED IN INFLATED DOLLARS; 97 AVAILABLE ROOMS

OCCUPANCY LEVEL / AVERAGE DAILY ROOM RATE	1992 (4) 52.0% At $266.70			1993 55.0% At $280.00			1994 57.0% At $296.00			1995 59.0% At $308.70			1996 60.0% At $324.20			1997 60.0% At $340.40		
	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM
OPERATING DEPARTMENTS REVENUES																		
Rooms	$4,910,000	50.1%	$50,619	$5,452,000	50.1%	$56,206	$5,933,000	50.1%	$61,165	$6,448,000	50.1%	$66,474	$6,887,000	50.1%	$71,000	$7,231,000	50.1%	$74,546
Food	3,636,000	37.1%	37,466	4,036,000	37.1%	41,608	4,392,000	37.1%	45,278	4,773,000	37.1%	49,206	5,097,000	37.1%	52,546	5,352,000	37.1%	55,175
Beverage	812,000	8.3%	8,371	902,000	8.3%	9,299	987,000	8.3%	10,176	1,066,000	8.3%	10,990	1,138,000	8.3%	11,732	1,195,000	8.3%	12,320
Telephone	58,000	0.6%	598	64,000	0.6%	660	71,000	0.6%	732	77,000	0.6%	794	82,000	0.6%	845	86,000	0.6%	887
Other Operated Departments	87,000	0.9%	897	97,000	0.9%	1,000	105,000	0.9%	1,082	114,000	0.9%	1,175	123,000	0.9%	1,268	129,000	0.9%	1,330
Rentals and Other Income	290,000	3.0%	2,990	322,000	3.0%	3,320	351,000	3.0%	3,619	380,000	3.0%	3,918	407,000	3.0%	4,196	427,000	3.0%	4,402
Total Operating Departments	9,791,000	100.0%	100,939	10,873,000	100.0%	112,093	11,836,000	100.0%	122,000	12,858,000	100.0%	132,557	13,734,000	100.0%	141,587	14,420,000	100.0%	148,660
DEPARTMENTAL EXPENSES (1)																		
Rooms	2,013,000	41.0%	20,753	2,208,000	40.5%	22,761	2,371,000	40.0%	24,464	2,535,000	39.0%	26,134	2,617,000	38.0%	26,979	2,748,000	38.0%	28,330
Food and Beverage	4,668,000	105.0%	48,124	5,046,000	101.0%	52,433	5,481,000	102.0%	56,505	5,897,000	101.0%	60,794	6,255,000	100.0%	64,278	6,567,000	100.0%	67,695
Telephone	78,000	134.5%	804	85,000	133.0%	876	94,000	132.0%	969	101,000	131.0%	1,041	107,000	130.0%	1,103	112,000	130.0%	1,155
Other Operated Departments	104,000	120.0%	1,072	112,000	115.0%	1,155	116,000	110.0%	1,196	120,000	105.0%	1,237	123,000	100.0%	1,268	129,000	100.0%	1,330
Total Departmental Expenses	6,863,000	70.1%	70,753	7,491,000	68.9%	77,227	8,064,000	68.1%	83,134	8,633,000	67.1%	89,000	9,102,000	66.3%	93,828	9,556,000	66.3%	98,510
TOTAL OPERATING PROFIT	2,928,000	29.9%	30,186	3,382,000	31.1%	34,866	3,770,000	31.9%	38,866	4,225,000	32.9%	43,557	4,632,000	33.9%	47,759	4,864,000	33.9%	50,150
UNDISTRIBUTED OPERATING EXPENSES																		
Administrative and general	1,567,000	16.0%	16,155	1,695,000	15.5%	17,371	1,775,000	15.0%	18,299	1,864,000	14.5%	19,216	1,921,000	14.0%	19,825	2,019,000	14.0%	20,814
Management Fees	250,000	2.6%	2,577	250,000	2.3%	2,577	250,000	2.1%	2,577	250,000	1.9%	2,577	250,000	1.8%	2,577	250,000	1.7%	2,577
Marketing	979,000	10.0%	10,093	1,087,000	10.0%	11,206	1,124,000	9.5%	11,588	1,157,000	9.0%	11,928	1,079,000	8.0%	11,130	1,156,000	8.0%	11,917
Energy	411,000	4.2%	4,237	435,000	4.0%	4,485	438,000	3.7%	4,515	474,000	3.5%	4,887	432,000	3.0%	4,454	431,000	3.0%	4,444
Property Operation and Maintenance	1,958,000	20.0%	20,186	2,120,000	19.5%	21,856	2,248,000	19.0%	23,175	2,379,000	18.5%	24,526	2,472,000	18.0%	25,485	2,596,000	18.0%	26,763
Total Undistributed Operating Expenses	5,165,000	52.8%	53,248	5,577,000	51.3%	57,495	5,835,000	49.3%	60,154	6,074,000	47.2%	62,618	6,156,000	44.8%	63,466	6,452,000	44.7%	66,515
INCOME BEFORE FIXED CHARGES	(2,237,000)	-22.8%	(23,062)	(2,195,000)	-20.2%	(22,629)	(2,065,000)	-17.4%	(21,288)	(1,849,000)	-14.4%	(19,061)	(1,524,000)	-11.0%	(15,705)	(1,588,000)	-10.9%	(16,365)
FIXED CHARGES (2)																		
Incentive Management Fees																		
Taxes	166,000	1.7%	1,711	174,000	1.6%	1,794	181,000	1.5%	1,867	192,000	1.5%	1,979	202,000	1.5%	2,082	212,000	1.5%	2,186
Insurance	112,000	1.1%	1,155	118,000	1.1%	1,216	124,000	1.0%	1,278	130,000	1.0%	1,340	137,000	1.0%	1,412	143,000	1.0%	1,474
Total Fixed Charges	278,000	2.8%	2,866	292,000	2.7%	3,010	307,000	2.6%	3,165	322,000	2.5%	3,319	339,000	2.5%	3,494	355,000	2.5%	3,660
INCOME BEFORE RESERVE (3)	($2,515,000)	-25.7%	($25,928)	($2,487,000)	-22.9%	($25,639)	($2,372,000)	-20.0%	($24,453)	($2,171,000)	-16.9%	($22,380)	($1,863,000)	-13.4%	($19,199)	($1,943,000)	-13.3%	($20,025)
RESERVE FOR REPLACEMENT	196,000	2.0%	2,021	326,000	3.0%	3,361	355,000	3.0%	3,660	386,000	3.0%	3,979	412,000	3.0%	4,247	433,000	3.0%	4,464
INCOME AFTER RESERVE BUT BEFORE OTHER CHARGES	($2,711,000)	-27.7%	($27,949)	($2,813,000)	-25.9%	($29,000)	($2,727,000)	-23.0%	($28,113)	($2,557,000)	-19.9%	($26,359)	($2,255,000)	-16.4%	($23,246)	($2,356,000)	-16.3%	($24,289)

Notes: (1) Each departmental expense ratio is based on the department's estimated revenues.
(2) Fixed charges do not include interest expense, depreciation, amortization, or income taxes.
(3) Income before reserve for replacement, interest, depreciation, amortization and income tax.
(4) 12 months in operation the opening year.

Source: PKF Hawaii

Table 5.1.1 (continued)
Statement of Estimated Annual Operating Results Without Golf Course, 1992 - 2003

HOTEL NANA MAUI
NANA, MAUI, HAWAII
STATEMENT OF ESTIMATED ANNUAL OPERATING RESULTS WITHOUT GOLF COURSE
STATED IN INFLATED DOLLARS; 97 AVAILABLE ROOMS

OCCUPANCY LEVEL / AVERAGE DAILY ROOM RATE	1998 60.0% AT $357.40			1999 60.0% AT $375.30			2000 60.0% AT $394.00			2001 60.0% AT $413.70			2002 60.0% AT $434.40			2003 60.0% AT $456.10		
	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM
OPERATING DEPARTMENTS REVENUES																		
Rooms	$7,592,000	50.1%	$78,268	$7,972,000	50.1%	$82,186	$8,370,000	50.1%	$86,289	$8,788,000	50.1%	$90,598	$9,228,000	50.1%	$95,136	$9,689,000	50.1%	$99,887
Food	5,620,000	37.1%	57,938	5,901,000	37.1%	60,835	6,196,000	37.1%	63,876	6,506,000	37.1%	67,077	6,831,000	37.1%	70,423	7,173,000	37.1%	73,948
Beverage	1,255,000	8.3%	12,938	1,318,000	8.3%	13,588	1,384,000	8.3%	14,268	1,453,000	8.3%	14,979	1,526,000	8.3%	15,732	1,602,000	8.3%	16,515
Telephone	90,000	0.6%	928	95,000	0.6%	979	99,000	0.6%	1,021	104,000	0.6%	1,072	109,000	0.6%	1,124	114,000	0.6%	1,175
Other Operated Departments	135,000	0.9%	1,392	142,000	0.9%	1,464	149,000	0.9%	1,536	156,000	0.9%	1,608	164,000	0.9%	1,691	172,000	0.9%	1,773
Rentals and Other Income	469,000	3.0%	4,629	471,000	3.0%	4,856	495,000	3.0%	5,103	520,000	3.0%	5,361	546,000	3.0%	5,629	573,000	3.0%	5,907
Total Operating Departments	15,141,000	100.0%	156,093	15,899,000	100.0%	163,908	16,693,000	100.0%	172,093	17,527,000	100.0%	180,690	18,404,000	100.0%	189,733	19,323,000	100.0%	199,205
DEPARTMENTAL EXPENSES (1)																		
Rooms	2,885,000	38.0%	29,742	3,029,000	38.0%	31,227	3,181,000	38.0%	32,794	3,339,000	38.0%	34,423	3,507,000	38.0%	36,155	3,682,000	38.0%	37,959
Food and Beverage	6,875,000	100.0%	70,876	7,219,000	100.0%	74,423	7,580,000	100.0%	78,144	7,959,000	100.0%	82,052	8,357,000	100.0%	86,155	8,775,000	100.0%	90,464
Telephone	117,000	130.0%	1,206	124,000	130.0%	1,278	129,000	130.0%	1,330	135,000	130.0%	1,392	142,000	130.0%	1,464	148,000	130.0%	1,526
Other Operated Departments	135,000	100.0%	1,392	142,000	100.0%	1,464	149,000	100.0%	1,536	156,000	100.0%	1,608	164,000	100.0%	1,691	172,000	100.0%	1,773
Total Departmental Expenses	10,012,000	66.1%	103,216	10,514,000	66.1%	108,392	11,039,000	66.1%	113,804	11,589,000	66.1%	119,475	12,170,000	66.1%	125,465	12,777,000	66.1%	131,722
TOTAL OPERATING PROFIT	5,129,000	33.9%	52,877	5,385,000	33.9%	55,516	5,654,000	33.9%	58,289	5,938,000	33.9%	61,215	6,234,000	33.9%	64,268	6,546,000	33.9%	67,483
UNDISTRIBUTED OPERATING EXPENSES																		
Administrative and general	2,170,000	14.0%	21,856	2,226,000	14.0%	22,948	2,317,000	14.0%	24,093	2,454,000	14.0%	25,299	2,577,000	14.0%	26,567	2,705,000	14.0%	27,887
Management Fees	250,000	1.7%	2,577	250,000	1.6%	2,577	250,000	1.5%	2,577	250,000	1.4%	2,577	250,000	1.4%	2,577	250,000	1.3%	2,577
Marketing	1,211,000	8.0%	12,485	1,272,000	8.0%	13,113	1,335,000	8.0%	13,763	1,402,000	8.0%	14,454	1,472,000	8.0%	15,175	1,546,000	8.0%	15,938
Energy	454,000	3.0%	4,680	477,000	3.0%	4,918	501,000	3.0%	5,165	526,000	3.0%	5,423	552,000	3.0%	5,691	580,000	3.0%	5,979
Property Operation and Maintenance	2,725,000	18.0%	28,093	2,862,000	18.0%	29,505	3,005,000	18.0%	30,979	3,155,000	18.0%	32,526	3,313,000	18.0%	34,155	3,478,000	18.0%	35,856
Total Undistributed Operating Expenses	6,760,000	44.6%	69,691	7,087,000	44.6%	73,061	7,428,000	44.5%	76,577	7,787,000	44.4%	80,279	8,164,000	44.4%	84,165	8,559,000	44.3%	88,237
INCOME BEFORE FIXED CHARGES	(1,631,000)	-10.8%	(16,814)	(1,702,000)	-10.7%	(17,545)	(1,774,000)	-10.6%	(18,288)	(1,849,000)	-10.5%	(19,064)	(1,930,000)	-10.5%	(19,897)	(2,013,000)	-10.4%	(20,754)
FIXED CHARGES (2)																		
Incentive Management Fees																		
Taxes	222,000	1.5%	2,289	231,000	1.5%	2,402	245,000	1.5%	2,526	257,000	1.5%	2,649	270,000	1.5%	2,784	284,000	1.5%	2,928
Insurance	151,000	1.0%	1,557	158,000	1.0%	1,629	166,000	1.0%	1,711	174,000	1.0%	1,794	183,000	1.0%	1,887	135,000	0.7%	1,392
Total Fixed Charges	373,000	2.5%	3,846	391,000	2.5%	4,031	411,000	2.5%	4,237	431,000	2.5%	4,443	453,000	2.5%	4,671	419,000	2.2%	4,320
INCOME BEFORE RESERVE (3)	($2,004,000)	-13.2%	($20,660)	($2,093,000)	-13.2%	($21,576)	($2,185,000)	-13.1%	($22,525)	($2,280,000)	-13.0%	($23,507)	($2,383,000)	-12.9%	($24,568)	($2,432,000)	-12.6%	($25,074)
RESERVE FOR REPLACEMENT	606,000	4.0%	6,247	636,000	4.0%	6,557	668,000	4.0%	6,887	526,000	3.0%	5,423	552,000	3.0%	5,691	580,000	3.0%	5,979
INCOME AFTER RESERVE BUT BEFORE OTHER CHARGES	($2,610,000)	-17.2%	($26,907)	($2,729,000)	-17.2%	($28,133)	($2,853,000)	-17.1%	($29,412)	($2,806,000)	-16.0%	($28,930)	($2,935,000)	-15.9%	($30,259)	($3,012,000)	-15.6%	($31,053)

Notes: (1) Each departmental expense ratio is based on the department's estimated revenues.
(2) Fixed charges do not include interest expense, depreciation, amortization, or income taxes.
(3) Income before reserve for replacement, interest, depreciation, amortization and income tax.
(4) 12 months in operation the opening year.

Source: PKF Hawaii

5.2 HOTEL MANAGEMENT ALTERNATIVE

Various individuals and organizations have suggested that Keola could successfully increase its Hotel occupancy rates by implementing different hotel management options. PKF reviewed the feasibility of implementing three different hotel management strategies to increase hotel occupancy: increase marketing efforts, reduce hotel rates, and promote different themes.

5.2.1 INCREASED MARKETING EFFORTS

It was suggested that the Hotel Hana-Maui could increase its occupancy rates by increasing its marketing efforts. Currently, the Hotel is spending twice as much on marketing as its competitors. In 1990 and 1991, the Hotel's marketing expenses were 13.5 and 10.8 percent of total revenue, respectively. In comparison, 1990 marketing expenses for primary luxury hotels in Hawaii averaged 5.6 percent, and all categories of Hawaii hotels averaged 4.0 percent. Since the Hotel is already spending significantly more on marketing than its competitors, it does not seem likely that increased marketing expenditures would result in significantly higher occupancy rates. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.2.2 REDUCED HOTEL RATES

The strategies of discounting room rates and lowering hotel standards will not work effectively with the Hotel Hana-Maui because of its small number of rooms and orientation as a primary luxury hotel. The strategy of discounting rates to increase room occupancy is normally successful for larger, non-primary luxury hotels. These types of hotels have a sufficient number of rooms to permit them to offer lower room rates and generate high enough room revenues and economies of scale to break-even or be profitable. The Hotel Hana-Maui's 97 rooms, however, is too small an inventory to create the necessary volume of revenues and profits.

Moreover, the Hotel Hana-Maui has consistently marketed itself as a secluded world-class luxury resort for the wealthy. It has spent years and millions of dollars on creating this prestigious image. This world-class luxury image would be "destroyed" if room rates are discounted substantially or luxury standards are lowered.

Major discounting will tend to have negative impact on primary luxury class guests who are less price sensitive and may interpret the discounting as a reduction in service, class of operation and prestige. Continued discounting would eventually lead to a lowering of the Hotel's standards and downward positioning of the Hotel in the market place. Although a lowering of the Hotel's standards will save operating costs, discriminating luxury class guests will notice the reduction in standards and service and probably not return. The Hotel would then be forced to discount its rates to match its lowered standards, thus positioning itself further downward in the market place. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.2.3 PROMOTIONAL THEMES

The implementation of various promotional themes such as ecotours, health spas, Hawaiian cultural, arts and crafts activities, ocean activities and tennis would probably not increase the Hotel's occupancy rates significantly. The Hotel is already providing all of these activities to varying degrees, and would need to increase the availability of such activities in the future just to be competitive with other primary luxury hotels.

Although these types of activities are expected at a primary luxury resort, they are not major tourist attractions which would significantly increase room occupancy if expanded. A 1988 University of Hawaii (UH) study entitled Tourist Attractiveness of Hawaii By County examined the attraction of Hawaii as a viable tourism destination by determining attractivity indices of its four counties. The UH study identified 16 criteria for touristic attractiveness which are presented in Table 5.2.1. The UH survey results (Table 5.2.2) rank ecotours, health spas, and Hawaiian cultural, arts and crafts activities near the bottom one-third of the list in attractiveness. In comparison, land sports which includes golf, was ranked as the fifth most attractive item. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

Table 5.2.1 CRITERIA FOR TOURISTIC ATTRACTIVENESS

Criteria Considerations	
A. NATURAL FACTORS	
1. Natural beauty	General topography; flora and fauna; proximity to lakes, rivers, sea; islands and islets; caves; waterfalls
2. Climate	Amount of sunshine; temperature; winds; precipitations; discomfort index
B. SOCIAL FACTORS	
3. Festivals, fairs, and exhibits	Music and dance festivals; sports events and competitions; concerts; cultural events; commercial fairs
4. Attitudes towards tourists	Local congeniality and treatment of tourists; aloha spirit
5. Distinctive local features	Folk dress; folk music and dances (not organized); local cuisine; fold handicrafts; specialized products; Polynesian Cultural Center luaus; local architecture; churches; monuments; art museums
C. HISTORICAL FACTORS	
6. Ancient ruins	Existence, condition, and accessibility of ancient ruins; heiaus; petroglyphs
7. Religious significance	Religious importance, in terms of present religious observances and practices
8. Historical prominence	Extent to which a site may be well known because of important historical events and/or legends (e.g., Pearl Harbor)
D. RECREATION AND SPORTS	
9. Land sport facilities	Golf; tennis
10. Ocean-related sports	Swimming; surfing; snorkeling; scuba diving; fishing; boating
11. Facilities conducive to health,	Health spas; hot-water spas; hiking trails; picnic grounds rest, and tranquility
E. INFRASTRUCTURE, FOOD, AND SHELTER	
12. Infrastructure above	Highways and roads; water, electricity, and gas; safety "minimal touristic quality" services; health services; communications; public transportation facilities
13. Food and lodging facilities	Hotels; restaurants; condos; resorts; camping facilities above "minimal touristic quality"
F. SHOPPING, EDUCATIONAL, AND EVENING ACTIVITIES	
14. Shopping facilities	Souvenir and gift shops; handicraft shops; department stores; boutiques; duty free shops; groceries and necessities
15. Nighttime recreation	Night clubs; discotheques; theaters; dinner shows and cruises
16. Educational facilities	Archaeological and ethnographic museums; zoos; botanical gardens; aquariums; commercial parks

Source: Tourist Attractiveness of Hawaii by County

Table 5.2.2 ATTRACTIVITY SCORES FOR MAUI, 1986

RANK	ATTRACTIVITY ITEM	RANK SUM
1.	Climate	436.5
2.	Natural Beauty	422.5
3.	Food & Lodging Above "Minimal Touristic Quality"	405.5
4.	Ocean Sports	375.0
5.	Land Sports	340.5
6.	Shopping Facilities	310.5
7.	Infrastructure Above "Minimal Touristic Quality"	302.0
8.	Attitudes Towards Tourists	241.5
9.	Nighttime Activities	239.0
10.	Historical Prominence	224.0
11.	Distinctive Local Features	179.0
12.	Festivals, Fairs, and Exhibits	178.0
13.	Facilities Conducive to Health, Rest, and Tranquility	144.0
14.	Ancient Ruins	118.5
15.	Educational Facilities	100.5
16.	Religious Significance	63.0

Source: Tourist Attractiveness of Hawaii by County

5.3 AGRICULTURAL BASED PRODUCTION ALTERNATIVE

The feasibility of converting portions of existing Hana Ranch pasture land into agriculture production was evaluated by Mr. Frank S. Scott Jr., PhD. His report is summarized below and included in its entirety in Appendix C.

The analysis of the agricultural feasibility for various agriculturally-based products were determined using the criteria specified below:

1. Ecological Adaptation, consisting of soil type, configuration, topography, accessibility, rainfall, need for and potential availability of irrigation water, temperature, wind, light intensity and environmentally related disease and insect problems.
2. Sales Potentials, consisting of market potentials for ecologically adaptable crops and the comparative advantage of crops in the project area to compete in the marketplace.
3. Economic Viability, including profitability and comparative advantage in relation to competing areas.
4. Intensity of Production, consisting of gross and net returns per acre as indicators of use value of the land.

Alternative agricultural crops which were considered are generally ecologically adaptable to soils located within the project site and within Hana Ranch lands. However, these lands are only marginal in productivity, and there are no prime agricultural lands located within Hana Ranch lands. These soil classifications and characteristics are discussed in more detail in Section 6.2. Table 5.3.1 shows the selected crop productivity ratings for soils located within the project site using classification systems discussed in Section 6.2.

Table 5.3.1. Selected Crop Productivity Ratings

Selected Productivity Ratings by Soil Type

Soil Type	Acreage	Vegetables	Sugarcane	Orchards	Grazing
C14	80	b	c	b	c
C17	62	d	c	b	c
D15	57	e	e	c	c
E7	2	e	e	e	e

Acreage of Each Crop in Each Soil Capability Classification

	Soil Capability Classification			
Crop	a	b	c	d & e
Vegetables	0	80	0	121
Sugarcane	0	0	142	59
Orchards	0	142	57	2
Grazing	0	0	199	2

Source: Frank S. Scott, Jr., Ph.D.

5.3.1 TRUCK CROPS

The variety and acreage of truck crops that can be grown in the State of Hawaii are extremely limited since most major vegetables, such as onions, asparagus and carrots, are better adapted to more temperate climates. For vegetables that are adapted to production in Hawaii, the sales potentials are essentially those quantities required to displace imports. As shown in Table 5.3.2, the acreage required to displace imports are very limited making the sales potential for the production of truck crops not a viable alternative to meet Keola's economic objectives. Not only is the opportunity for vegetable production in Hawaii limited, but most of the crops considered are better adapted to other areas in the State than to Hana Ranch lands.

Table 5.3.2. Acreage Required to Displace Imports of Selected Vegetables

Crop Description	Imports (1,000 pounds)	Yield per Acre (1,000 pounds)	Acreage Required
Snap Beans	422	12	35
Sweet Corn	152	8	19
Cucumbers	1,968	20	98
Eggplant	351	30	12
Green Peppers	2,652	20	133
Sweet Potatoes	1,080	20	54
Tomatoes	13,996	35	400
Total Acreage Required			751

Source: Statistics of Hawaiian Agriculture

Of the adaptable crops, tomatoes would offer the best opportunity for expansion in Hawaii vegetable production since 400 acres would be required to displace imports. However, most local production occur in greenhouses where irrigation water and reasonable access to markets are required. As a result, tomatoes is not a crop to be considered for Hana Ranch, where this crop alone could not justify the development of greenhouses and an irrigation system.

Since several truck crops are marginally adaptable to the project area and surrounding Hana Ranch lands, a composite budget analysis was utilized for estimating costs and returns and employment requirements. This composite includes snap beans, cucumbers, green peppers, and sweet potatoes. Staked, field produced tomatoes are not included, because most tomatoes are produced in green houses in Hawaii.

Based upon the analysis results, these crops are highly intensive and could be expected to provide a mean gross of $7,000 per acre and a net of $3,000 not considering land costs. This assumes no serious losses from disease, insects and other environmental problems. The production of the above listed crops (except for tomatoes) to displace imports would generate between $36,000 and $399,000 annually. Although these crops could be grown on Hana Ranch land, they are better adapted ecologically to other areas in the State, and would not likely be able to compete in the marketplace even if though they could be produced. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.3.2 ORCHARD CROPS

Hawaii produced orchard crops have generally not been able to compete favorably with imports. Commercial orchard production is limited in Hawaii, because of costs, quality, and an extremely limited market. In 1990, the Hawaii market consumed 16 million pounds of oranges from the U.S. mainland and only 1.3 million pounds of Hawaii produced oranges. About 2 million pounds of grapefruit were imported from the U.S. mainland and Hawaii production was negligible. There may be some opportunity of increasing Hawaii's market share of citrus fruit through quality control, but no meaningful breakthrough is evident at present.

Hawaii is the major world producer of macadamia nuts, but this situation is changing rapidly as production expands in foreign countries. The Hawaii industry has reached a point where production exceeds demand and prices have dropped below commercial costs of production making many farmers unable to market their nuts. The situation is expected to become more serious as more of the 22,000 acres in plantings reach maturity and yields per acre increase. The U.S. International Trade Commission has indicated that there is almost no possibility that stronger trade restrictions will be imposed to protect Hawaii's macadamia industry.

Estimates for the economic viability and intensity of macadamia production were derived from a study by Scott, Sisson, Kanda and Yeap. The projected maximum yield at orchard maturity at the project site is 5,000 pounds per acre in-shell. At a projected price of 90 cents per pound, a net return of $450 per acre could be expected not considering land costs and assuming no serious losses from disease or insects. Macadamia orchards located east of Hana appear to be experiencing disease because of ecological conditions. However, the Hawaii macadamia industry currently has a surplus of nuts in relation to demand partly due to cheaper imports, and the price recently dropped to 65 cents per pound in-shell which is below costs of production for many producers. Even at a price revival to 75 cents per pound, returns would result in a net loss of $300 per acre. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.3.3 BANANAS

Hawaii was self sufficient in banana production until 1967, after which time imports from Central and South America attained an important share of the market. Under good management, 377 acres of additional Hawaii production would be required to displace imports. With improved production and marketing practices, there is a reasonably good possibility that Hawaii producers could displace a major portion of banana imports. However, trends indicate there is little likelihood of a major expansion in banana production on Maui.

Modification of a study on costs and returns for bananas suggests a yield of 20,000 pounds per acre for Williams bananas, which provides a gross value per acre of $7,500 per acre at 35 cents per pound. The crop requires a high level of labor and fertilizer input with annual costs estimated at $7,000. Assuming no major losses from disease or Kona winds, which is unlikely, this would allow only a net return of $500 per acre. If all 377 acres of land were put into banana production, annual revenues of $188,500 could be generated. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.3.4 SUGARCANE

Sugarcane, although grown on the project site for many years was probably a marginal crop. It became uneconomical in 1946 during the movement into an era requiring higher yields and greater efficiency of production for economic viability. A combination of factors, including difficulty in plowing and fertilizing, and difficulty of harvesting during periods of high rainfall probably contributed to the demise of sugar production.

Under current conditions, with import barriers protecting the U.S. sugar industry, the sales potential itself is not a limiting factor to Hawaii sales of sugar. But the fact that sugarcane became uneconomical and was discontinued in the area in 1946 indicates that there is no possibility of a revival of the industry in Hana. Particularly crucial are marginality of production, high labor costs, prohibitive transportation costs and other economic disadvantages. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.3.5 FLOWERS AND FOLIAGE

The Hawaii floriculture and nursery products industry has undergone a marked expansion for several years. During the past ten years, gross sales increased from $29.5 million in 1981 to $70.3 million in 1990. Most of the production (85 percent) in 1990 was on the islands of Hawaii and Oahu with market shares of 48 percent and 37 percent, respectively. Maui and Molokai combined produced 12.8 percent of the 1990 total increasing from $4.0 million to $9.1 million.

Floriculture and nursery production in Hawaii is highly concentrated requiring only a small amount of land area. Land devoted to the production of flowers and foliage increased by only 688 acres over the past ten years to 2,298 acres in 1990.

CORRECTION

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

5.3.4 SUGARCANE

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Floriculture and nursery production in Hawaii is highly concentrated requiring only a small amount of land area. Land devoted to the production of flowers and foliage increased by only 688 acres over the past ten years to 2,298 acres in 1990.

An analysis of this alternative indicates that although the Hawaii floriculture and nursery products industry has contributed substantially to diversified agriculture income, the land area required for this industry is minimal and new acreage requirements based on past trends are very small. The analysis indicates that new acreage requirements amount to only 24 acres annually for field production and essentially no additional land for greenhouse production. The opportunity to share in part of the expansion depends partly on transportation facilities of which Keola would be at an disadvantage.

Flowers and foliage plants are the most intensive major agricultural crops produced in Hawaii. The average gross return for all types of production amounted to $30,600 per acre in 1990. Potted flowers and foliage are much more intensive than the average for all types of floriculture and nursery production. A net return of $10,000 per acre was estimated assuming efficient management and optimal production conditions.

The sales potential for the production of flowers and foliage on Hana Ranch lands is extremely limited, although, limited production of flowers and foliage on Hana Ranch lands may be feasible particularly since such production would be compatible with the hotel's visitor operation. However, the expansion of operations may not be feasible because of transportation disadvantages and the need for developing potable water resources at the rate of 3,000 gallons per acre per day. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.4 BEEF PRODUCTION ALTERNATIVE

The feasibility of expanding Hana Ranch's existing cattle ranching operations was evaluated. The results of a study conducted by Frank S. Scott Jr., PhD is summarized below and included in its entirety in Appendix C. As with Alternative 5.3, this alternative's feasibility was determined based upon the following criteria specified below:

1. Sales Potentials, consisting of market potentials for ecologically adaptable crops and the comparative advantage of crops in the project area to compete in the marketplace.
2. Economic Viability, including profitability and comparative advantage in relation to competing areas.
3. Intensity of Production, consisting of gross and net returns per acre as indicators of use value of the land.

The market for Hana Ranch cattle under the current production system has been firmly established and operational for many years. However, based upon revenue and expense information provided by Keola, this operation has historically not been profitable. This operation has lost money 11 of the past 12 years, with the only profitable year being a very small profit margin. The average annual losses for the past 29 years has been $135,000.

Currently, eight-month old weaner calves are shipped by surface transportation to buyers on neighboring islands and in California who market them for further development. The limited numbers of old cows and bulls in the operation are marketed on Maui and Oahu.

It is implied that this system is more economic than growing the calves to a sufficient range weight for sale as grass fed beef or as feeder cattle to Hawaii feedlots. This is due to disadvantages caused by high costs of grains and supplements, which must be imported from the U.S. mainland. Thus, the Hana Ranch cattle production and marketing system also encounters the similar decreasing comparative advantage of cattle feedlot operations in Hawaii.

Ironically, although many beef producers in Hawaii face serious economic problems, the market for beef in Hawaii far exceeds the ability of Hawaii producers to supply it. The market supply of beef and veal in Hawaii during the most recent 10-year period increased from a carcass weight of 94.8 million pounds in 1981 to 111.5 million pounds in 1990. However, Hawaii producer's share of this market decreased from 30 percent (28.7 million pounds) in 1981 to 26 percent (29.1 million pounds) in 1990. In 1990 the market share of beef marketing in Hawaii was 56 percent for the U.S. mainland, 26 percent for Hawaii and 18 percent for foreign suppliers. As previously shown, the Hana Ranch cattle operation has historically not been profitable, and reflects the declining feasibility of beef production in Hawaii in general. Beef production is the least intensive alternative for the project, with estimated gross returns of about $84 per acre for 1991. This alternative does not meet the project's objectives described in Section 3.2 and is not a viable alternative to the project.

5.5 ALTERNATIVE PROJECT LOCATIONS

Several alternative golf course sites on Keola owned lands were identified and investigated. These alternative sites were not selected because they did not meet one or more of the following site criteria:

1. The site should be located outside the Special Management Area to avoid directly impacting any beaches or shoreline areas.
2. The site should generally be located below the 600 foot elevation level to remain outside of Conservation zoned lands.
3. The overall agricultural productivity ratings for the site should be classified lower than "B" ratings or lands that are marginal for agricultural production.
4. The site should be located outside of the area designated by the community as sensitive to the "image of Hana" (generally, the area near the Hotel Hana-Maui).
5. The site should permit significant archaeological and historical sites to be incorporated into the golf course design.
6. The golf course landscaping should enhance and be compatible with the surrounding land characteristics.

SECTION 6.0
PHYSICAL AND NATURAL ENVIRONMENT

6.1 GEOLOGY AND TOPOGRAPHY

Hana lies within the northeast rift zone of Haleakala, as evidenced by the numerous cinder cones which dominate the area. Rift zones generally extend outward from a volcano summit and are structurally weak zones comprised of roughly parallel fissures from which magma discharges. In the shield building stage of a volcano, rift zones are marked by open cracks, collapse craters, and spatter cones. In the later stages, rift zones are dominated by cinder cones and spatter.

Three large cinder cones, Ka Iwi O Pele on the east, and Puu Kolo and Pahuolona on the west, border the project area. The project site lies along an easterly spur of this northeast rift zone, nestled between these cinder cones at ground surface elevation ranging from approximately 170 feet in the east to 550 feet in the southwest. The currently grazed grass-covered slopes range from 3 to 15 percent which is typical of the mile-wide coastal area. Above the 600 foot elevation level, the volcanic slopes rise at a generally uniform rate of 20 percent.

Three major periods of eruptions of Haleakala Volcano created East Maui and produced the three volcanic series of formations known as Honomanu, Kula, and Hana. The Honomanu series (the oldest) forms the basal core and bulk of East Maui. Covering this series of typically permeable basalts are the more massive and less permeable basaltic andesite and basalt lava flows of the Kula series. Following the Kula activity, eruptions ceased for a long while during which time erosion carved out the remarkably deep canyons of Keanae, Waihoi, Kipahulu, and Kaupo.

Following this long period of quiescence, volcanic activity resumed along Haleakala's southwest and northeast rift zones producing the Hana series of basalts, andesitic basalts, and andesites, which partially filled the deep canyons and blanketed much of the eastern part of East Maui, including the Hana area. This Hana volcanic series also produced a line of spatter and cinder cones which are very evident in the Hana area. Numerous lava flows eventually covered the slopes of Hana and numerous cinder cones were produced with blankets of ash and cinder deposited around them. Consequently, the subsurface presumably consists of numerous lava flows interjected with and buried ash and cinder deposits. The Hana series of lava flows are mostly permeable.

Geotechnical Study

Pacific Geotechnical Engineers, Inc. (PGE) performed geotechnical services to study the surface soils and the subsurface conditions in the project site. Their report is included in its entirety in Appendix N.

The results of PGE's three soil test borings and a seismic refraction survey indicate that the surface soils over the majority of the project area appear to be on the order of 2 to 9 feet in thickness. Variations in the soil cover thickness across the site is probably due to the rubbly surface of the former Aa lava flow, variations in thickness of ash and cinder deposited over the area, and the close proximity of the project site to existing cinder cones. No cavities, voids, or lava tubes were encountered in the borings drilled for the study. Some cavities, voids, and lava tubes, however, may potentially exist within the lava formation beneath the project area. No perched ground water was observed during PGE's field work.

6.2 SOILS AND AGRICULTURAL LANDS

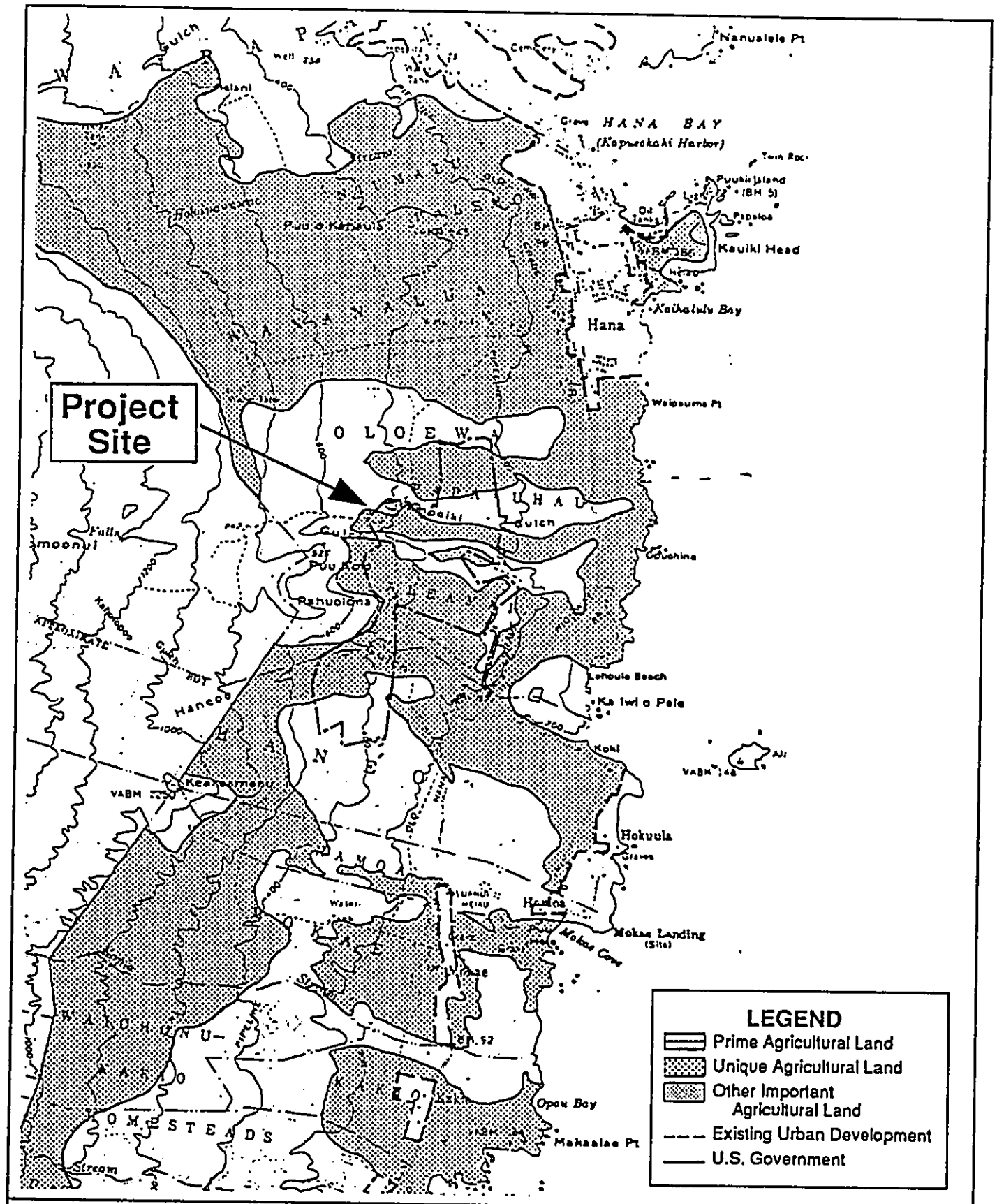
An agricultural study was conducted by Frank S. Scott, Jr., PhD to investigate the probable impacts associated with displacement of existing grazing lands along with its effects on the agricultural potential for Maui due to the project. Mr. Scott's report is summarized below and included in its entirety in Appendix C.

6.2.1 EXISTING CONDITIONS

Existing pasture lands proposed to be displaced by the project are described in terms of soil capability classifications by the U.S. Department of Agriculture Soil Conservation Service (SCS), the University of Hawaii Land Study Bureau (LSB), and on-site observations. In addition Agricultural Lands of Importance to the State of Hawaii (ALISH) were assessed.

6.2.1.1 ALISH Classifications

ALISH classifications established by the State Department of Agriculture, with assistance from the SCS and College of Tropical Agriculture, University of Hawaii, for the area in the vicinity of the project site are shown in Figure 6.2.1. Approximately 137 acres or 70 percent of the project area is classified as Other Important Agricultural Land while the remaining 30 percent is unclassified. Other Important Agricultural Land is considered of importance to the state or the local community for the production of food, feed, fiber and for forage crops, but is not Prime Agricultural Land.



PACIFIC PLANNING

Source: State Dept. of Agriculture

Agricultural Lands of Importance to the State of Hawaii

Figure 6.2.1

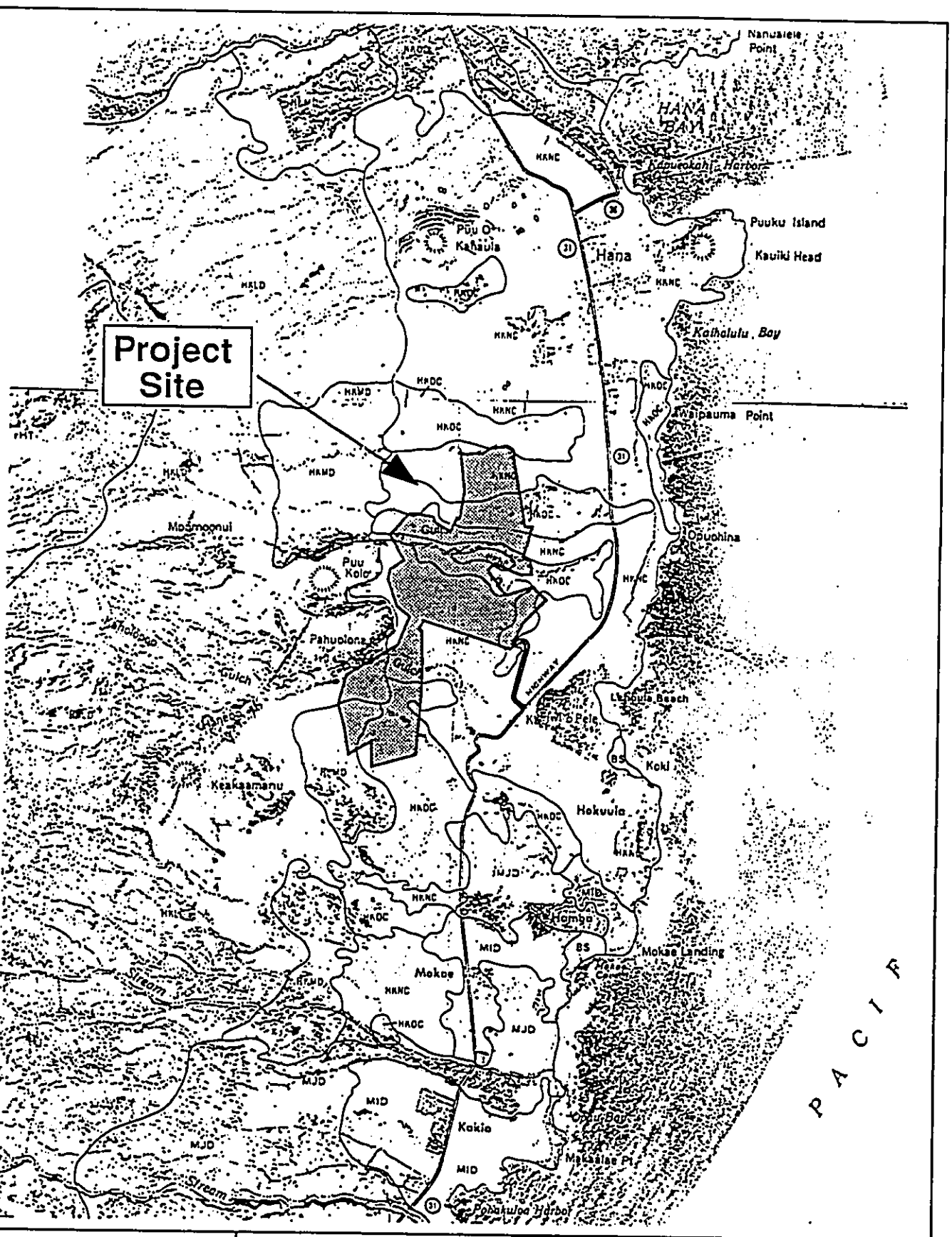
6.2.1.2 SCS Classifications

The SCS's soil capability classifications are based upon soil profile, topography, water holding capacity, drainage, erosion hazard, pH, workability, and depth of root penetration. The SCS soil capability classifications range from Class I to Class VIII, with Class I having minimal limitations restricting crop production and Class VIII having the most severe limitations. Classes IV through VIII are unsuitable for cultivated crop production. The SCS classifications for the project site are shown in Figure 6.2.2. Soils in the Hana area are classified as the Hana series which are gently sloping to moderately steep, with elevations ranging from nearly sea level to 1,200 feet.

Hana Silty Clay Loam (HKNC)

This subseries, shown on Figure 6.2.2, encompasses approximately 102 acres or 51 percent of the land area in the project site. The topsoil is dark-brown silty clay loam, containing 10 to 15 percent gravel and cobblestones, but no large stones. Presently, gravel and cobblestones appear minimal on the surface probably due to improvement while under sugarcane cultivation.

The soil is classified as IIIs indicating severe erosion problems if cultivated and not protected. If the soils are well managed, the pasture capability is indicated to be 8,400 to 14,000 pounds of forage per acre per year. Hana Ranch estimates the actual annual carrying capacity to be a very high with 1.6 acres per animal unit without fertilizing due to the use of paddock rotation that appears to maximize carrying capacity and minimize problems of brush encroachment.



PACIFIC PLANNING ENGINEERING, INC. Source: U.S. Dept. of Agriculture, Soil Conservation Service	Soil Classification	Figure 6.2.2

Hana Extremely Stony Silty Clay Loam (HKQC)

This soil includes about 72 acres or 36 percent of the project site, and has a profile similar to that of HKNC by having a moderately deep variant with 3 to 15 percent slopes. It is inferior to HKNC because of stones that cover 3 to 15 percent of the surface, and workability is very difficult. It is given a capability classification of VIs which indicates severe limitations because of the erosion hazard and is generally unsuited to cultivation. However, for grazing it is almost equal to HKNC except for the more serious erosion problems and the existence of stones making pasture improvement difficult.

Hana Very Stony Silty Clay Loam (HKLD).

This subseries contains 12 acres or 6 percent of the project site. The topsoil is very dark brown and very dark grayish-brown about 12 inches deep. The subsoil is dark brown silty clay loam about 22 inches thick, with a subangular blocky structure. The substratum consists of moderately weathered, pebble-size cinders overlying a'a lava. The topsoil is medium to strongly acid and the subsoil is slightly acid.

The SCS capability classification is VIs making this soil generally unsuited to cultivated crop production because of erosion. However, it has a pasture carrying capacity comparable to the HKNC subseries except that pasture improvement is more difficult.

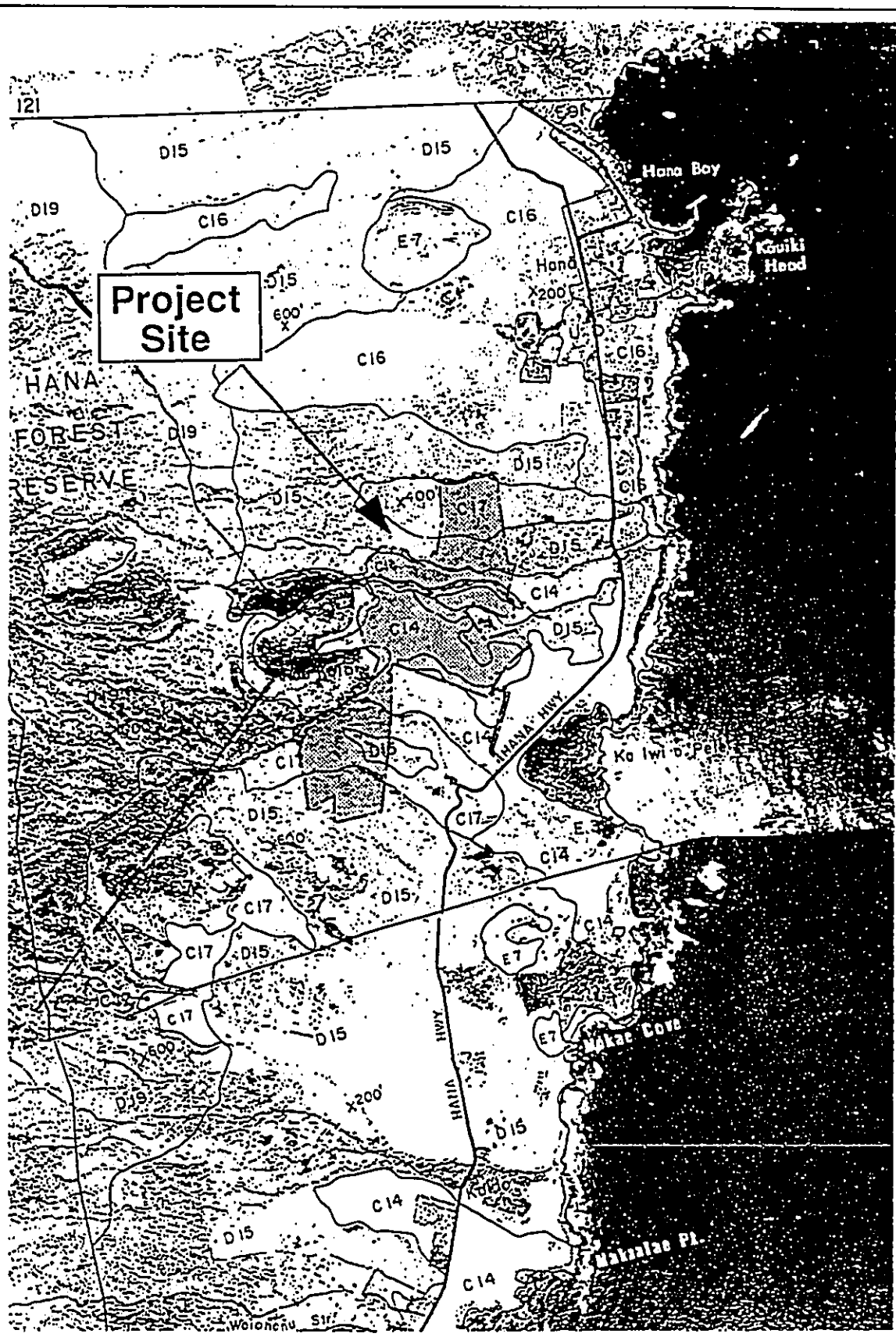
Hana Extremely Stony Silty Clay Loam (HKMD).

This soil consists of a pocket of 15 acres or 7 percent of the land area in the project site. It has a profile similar to HKLD, except that stones cover 3 to 15 percent of the surface. The subseries includes small, steep areas near cinder cones. The soil is classified at VIs and is not adaptable to cultivated crop production, but can be used for pasture.

6.2.1.3 Land Study Bureau Classifications

The LSB classifies soils by land type in which classifications are provided for overall crop productivity ratings. The LSB land capability classifications for soils within the project site are shown in Figure 6.2.3. LSB overall ratings for cultivated crop production and grazing range from "A" to "E", with "A" being the best. The overall productivity ratings evaluate each land type in its general productive capacity for agricultural use and not for specific crops. Selected ratings for individual crops range from "a" to "e", with "a" being the best.

These LSB ratings are comparable to those of SCS, but differ somewhat because of fewer categories and from slightly different soil capability criteria. Because of these minor differences, the use of both SCS and LSB methods provide a more comprehensive evaluation of agriculture lands. Table 6.2.1 provides a comparison of both these ratings for agricultural land located within the project site. Based on SCS land capability classifications, 51 percent of the project soils are marginal for crop production and 49 percent are not adaptable to cultivated crop production. LSB classifies 71 percent in the marginal category and 29 percent as not adaptable.



PACIFIC PLANNING ENGINEERING, INC.

Source: Land Study Bureau, 1967
University of Hawaii

Land Study Bureau Classification

Figure 6.2.3

Table 6.2.1. SCS and LSB Land Capability Classifications

Agency	Soil Type	Classification	Acreage	Percent
SCS	HKNC	IIIs	102	51
	HKOC	IVs	72	36
	HKLD	VIs	12	6
	HKMD	VIs	15	7
LSB	C14	C	80	40
	C17	C	62	31
	D15	D	57	28
	E7	E	2	1
Summary				
SCS		I & II	0	0
		III	102	51
		IV - VIII	99	49
LSB		A & B	0	0
		C	142	71
		D & E	59	29

Source: Frank S. Scott, Jr.

6.2.2 PROBABLE IMPACTS

No-Action Alternative

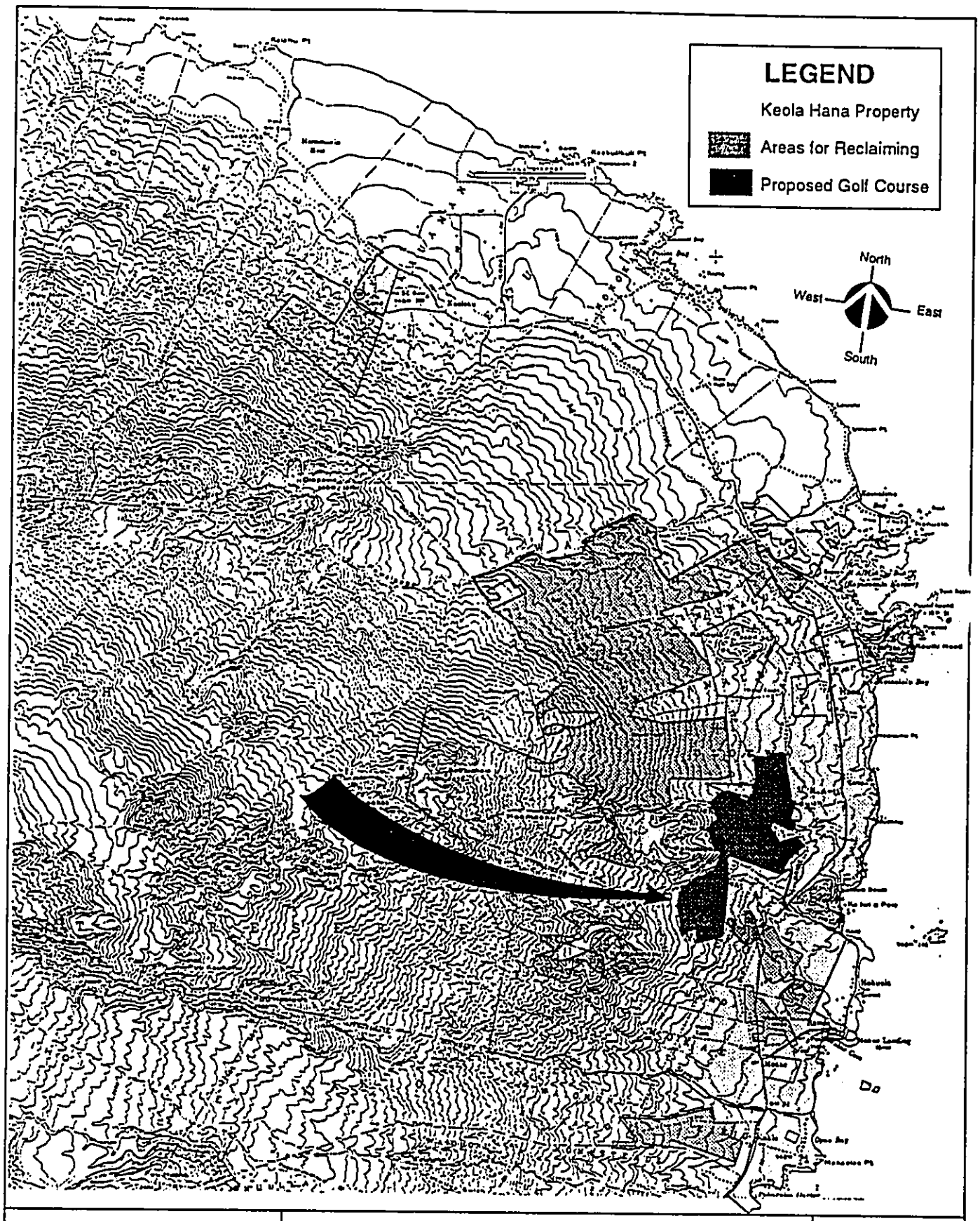
Under the No-Action Alternative, the existing cattle operations would continue on the project site. Consequently, there would be no displacement of agricultural lands currently used as pasture land.

Proposed Project

The withdrawal of 201 acres of grazing land for the project would be offset by the reclaiming of 680 acres of brush land for grazing. Intensifying grazing capacity for given land areas through soil improvement is also under consideration. Figure 6.2.4 shows the general areas that would be reclaimed.

The project location would divide the existing grazing area, and cause some reduction in operating efficiency in transferring cattle from paddock to paddock in the rotation system. The overall effect on ranching operations because of this inconvenience is expected to be minimal.

Historical trends and data of agricultural production in Maui County provide a meaningful indicator of the need for agricultural land to the island of Maui. Acreage in cultivated crop production for Maui county decreased by a very substantial 24 percent from 83,600 acres in 1981 to 63,200 acres in 1990. Cattle statistics indicate a decrease in the number of beef cows from 15,300 head in 1981 to 12,700 head in 1990. During the past 10 years, land zoned agricultural on the island of Maui decreased by only 3,744 acres to 408,000 acres in 1990, and land zoned Urban and Rural increased by only 3,674 acres to 23,084 acres in 1990. This compares with the decrease of 20,400 acres in cultivated crop production during the same period. Based on these trends, there is no indication that the 201 acres that would be converted from agriculture to golf course use would have a significant negative impact on acreage needed for crop production and grazing on Maui.



PACIFIC PLANNING & ENGINEERING, INC Source: Keola Hana Maui, Inc. Master Plan	Areas Proposed for Reclaiming	Figure 6.2.4

6.3 GROUNDWATER RESOURCES

A study was conducted by Water Resource Associates to assess the groundwater resources in the Hana area. The existing groundwater resources and sustainable yield of the area are described below, and their report included in its entirety in Appendix D.

To further assess the probable impacts to groundwater resources resulting from the project, a risk assessment analysis of pesticide and fertilizer use was conducted by Environmental and Turf Services, Inc. (ETS). Their report is discussed below and included in its entirety along with an Integrated Golf Course Management Plan (IGCMP) in Appendix E.

6.3.1 EXISTING CONDITIONS

Kawaipapa Aquifer System

The island of Maui has been divided into six groundwater sectors, one of which is the Hana Sector (State Commission on Water Resource Management, 1990). The Hana Sector is subdivided into four aquifer systems, one of which is the Kawaipapa Aquifer System comprising the eastern tip of East Maui and extending along the coast from Honomaele Gulch (located 12 miles west of Hana Airport) southward to Kapaia Stream near Hamoa. The project site is located within the Kawaipapa Aquifer System which consists principally of high-level, dike confined groundwater aquifers in the mountainous interior areas and basal aquifers in the coastal areas. According to the Commission's 1990 report, the Kawaipapa Aquifer System has an estimated groundwater recharge of 109 million gallons per day (mgd) and an estimated sustainable yield of 48 mgd.

Hana's abundant rainfall occurs on the high slopes of Haleakala's northeast rift zone and is the source of groundwater recharge to the high-level and basal aquifers within the aquifer system. As shown in Figure 6.3.1, rainfall averages 100 inches a year approximately two miles inland from the coast and rapidly increases to over 200 inches a year two miles further inland at an elevation of 3,000 feet. Within the rift zone, numerous water-tight dikes create compartments of high-level ground water beneath the rugged interior slopes of Hana. However, this ground water probably lies too deep below the surface to be economically developable.

Basal Water

Ground water moves from the interior high-rainfall areas more or less directly toward the coast. In the vicinity of the project site, groundwater movement is assumed to be directly toward the coast. As rainfall and the number of dikes decrease toward the coast, bodies of high-level ground water become lower in step-like fashion and eventually spill into the basal aquifers along the coast. An interpretive hydrogeologic cross section of the Hana area is shown in Figure 6.3.2.

A total of seven wells have been drilled in the Kawaipapa Aquifer System, from Kaeleku near the Hana Airport to Mokae just south of Hamoa. The results of these wells, shown on Table 6.3.1, indicate that there are different basal aquifers in the Hana area which have different heads and chloride contents.

Outside of the rift zone in the Kaeleku and Hamoa areas, the basal aquifers are thicker (6.5 to 7.8 foot heads) and fresher (10 parts per million [ppm] initial chlorides) than those within the rift zone suggesting ground water which is uncontaminated by salt water intrusion.

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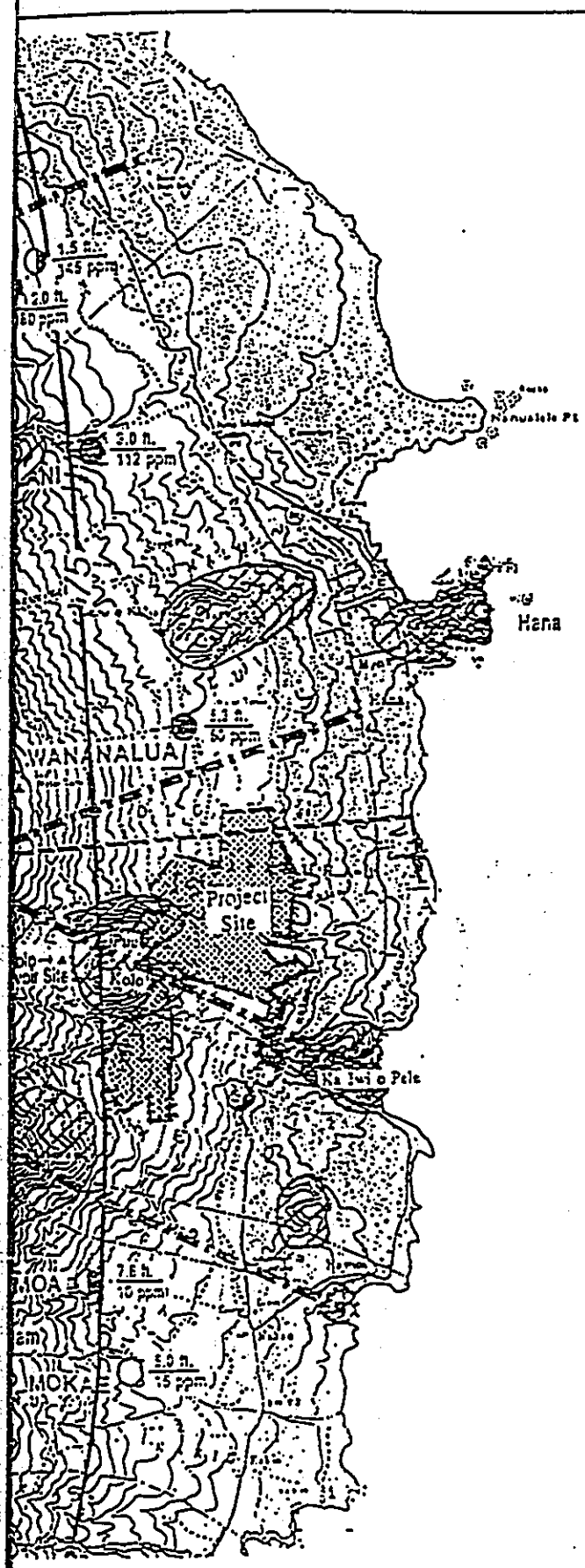
PACIFIC PLANNING & ENGINEERING, INC

Source: Water Resource Associates

COASTAL HYDROGEOLOGY OF HANA

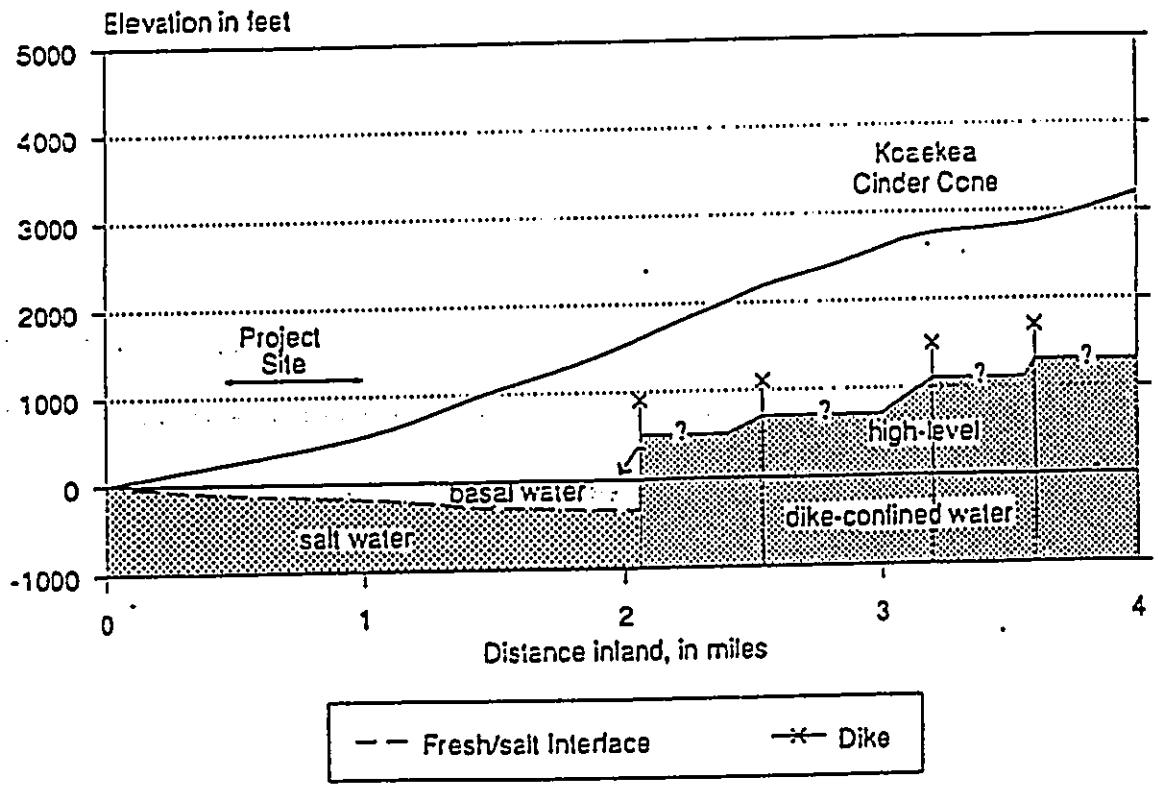


LEGEND:

—75"—	Median Annual Rainfall in inches
6 ft. / 4 ppm	Well, showing head (ft.) and Chloride (ppm)
	Keola Hana Maui Well
	County DWS Well
	Private Well
	Brackish Basal Ground Water (Inland boundary is approximate)
	Cinder/Spatter Cone Deposit
	Rift Zone Boundary

EOLOGY OF HANA

Figure
6.3.1



PACIFIC PLANNING & ENGINEERING, INC Source: Water Resource Associates	**Interpretive Hydrogeologic Cross Section**	**Figure 6.3.2**

Table 6.3.1 Wells in the Kawaipapa Aquifer System

Well Name	State Well No.	Owner	Year Drilled	Ground Elev. (ft.)	Csg Dia. (in.)	Csg Depth (ft.)	Well Depth (ft.)	Static Head (ft.)	Pump Cap. (mgd)	Initial Chloride (ppm)
Hamoa	4300-02	Maui DWS	1985	357	11	406	406	7.8	0.30	10
Helani	4600-01	Keola Hana	1949	250	8	271	280	3.0	0.17	35
Kaeleku	4701-01	Keola Hana	1959	403	10	426	426	6.5	0.36	9
Mokae	4300-01	Keaka-Wai	1981	213	4	195	223	5.0	--	15
Wakiu A	4600-02	Maui DWS	1972	266	10	285	288	1.5	0.10	133
Wakiu B	4600-03	Maui DWS	1976	306	10	320	323	2.0	0.10	180
Wananalua	4559-01	Keola Hana	1988	410	12	440	440	5.3	0.43	70

Source: Water Resource Associates

Within the rift zone, the data shown in the table indicate that four wells show three different basal aquifers with lower heads and higher chloride contents, reflecting some salt water intrusion. In the Wakiu area, the basal aquifer has a head of 1.5 to 2.0 feet and is more prone to salt water intrusion under pumping conditions. Chlorides in the Wakiu wells range close to 200 ppm, with 250 ppm being the arbitrary potable water limit. In the Helani area, the basal aquifer is slightly thicker with a head of 3.0 feet and slightly fresher with chlorides reported as high as 112 ppm. The thin, sensitive basal groundwater conditions encountered in the Wakiu-Helani area probably are due primarily to restricted recharge resulting from dike structures in the rift zone and to the absence of impermeable coastal caprock formations which would inhibit salt water intrusion.

6.3.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, there would be no major changes to existing land uses in the surrounding area along with the project site. As a result, ranching operations would continue and there should be no major changes to the existing conditions and quality of ground water resources.

Although the coastal slopes between Hana and Hamoa have been used for cattle grazing for over 47 years, the nitrate concentration in the Hamoa and Wananalua wells indicate no nitrate contamination of the basal aquifers. Moreover, the manure from the existing cattle is estimated to produce over 37,000 pounds of nitrogen (N) per year or more than ten (10) times the maximum loading estimated for the project.

Proposed Project

The proposed golf course is geologically located between the main northeast rift zone centered more or less along an axis through Hana and a southeast spur centered more or less along an axis through Hamoa. This spur off the rift zone is evidenced on the surface by eight closely spaced eruptive vents (mostly cinder cones) which surround the project site. Dikes associated with these eruptive vents have probably intruded the subsurface formations, creating basal aquifers in dike-intruded lavas having moderate to low permeability and limited groundwater recharge, similar to other rift zone areas where the hydrology is known.

Due to its partial isolation between the rift zone and its spur, the basal aquifer underlying the project site is anticipated to be thin (3 to 4 feet of head) and have less recharge than the basal aquifers at Hamoa and Wananalua. No wells have been drilled in the project site to confirm hydrologic conditions, but rift zone geology precludes the project site as a prime area for groundwater development.

The Hamoa well taps a separate basal aquifer from that of the Wananalua well. Not only does the Hamoa well lie outside (south) of the rift zone, but it is also separated from Wananalua by dike-intruded lavas associated with the intervening southeast spur of the rift zone. Hydrologic data from the two wells also confirms separate aquifers. The Hamoa basal aquifer is relatively thick with a high head of 7.8 feet and a pristine chloride content of 7 ppm. The Wananalua well is located in the rift zone and taps a basal aquifer with a lower head of 5.3 feet and a higher chloride content that ranges between 60 and 80 ppm.

Ground water in the Hana-Hamoa section of the Kawaipapa Aquifer System flows mauka to makai (eastward) from the broad interior recharge areas toward the coast. Consequently, the direction of groundwater flow in the basal aquifer underlying the project site is also mauka to makai to the coast rather than laterally to the south or north toward the basal aquifers tapped by the Hamoa and Wananalua wells, resulting in no expected contamination from chemical use on the project site.

The potential for contamination of the Hamoa and Wananalua well sources was also studied by calculating the maximum width of the zone of groundwater contribution to each well. The shape of the zone of groundwater contribution, or influence, is a parabola with the centerline coincident with the direction of groundwater flux or flow. For the Hamoa well, the maximum lateral extent on each side is equal to 421 feet and for the Wananalua well, it is equal to 588 feet. Thus, based upon their respective 2,500 and 2,700 feet distances from the nearest boundaries of the project site, the project is not expected to affect the Hamoa and Wananalua well sources.

Computer Simulation Models

To further assess the potential for chemical contamination, ETS conducted a risk assessment study to determine the probable impacts to ground and surface waters. State-of-the art, data intensive computer simulation models were used to predict the movement of turf chemicals. The field-validated EPA-endorsed SWRRBWQ computer simulation model was used to estimated concentrations of pesticides and fertilizers in surface runoff. The EPA-supported PRZM-VADOFT modeling system was used to simulate pesticides leaching (passing through) to groundwater.

The computer simulation model results show the project's effects on ground and surface waters will be well within water quality standards. In the reasonable worst case scenario (an approximation of the upper 95 percent confidence interval), pesticide concentrations at the top of the aquifer would be no greater than two percent of the lifetime Health Advisory Levels (HAL) and generally much lower. The drinking water HAL is the concentration in drinking water that could be consumed for a lifetime with no harmful effects. The expected nitrogen concentration increase in the top 5 feet of the aquifer, if the maximum amount of nitrogen is applied, would be less than 1 ppm. This is at least ten times less than the EPA allowable drinking water standard (Maximum Contaminant Level) of 10 ppm. Increases in nitrogen concentrations at the point where ground water discharges to the shoreline will probably be nondetectable.

The test results show there will be no impacts from runoff of fertilizers, herbicides, or fungicides. (Note: the insecticide chlorpyrifos raised some concerns for potential impacts on aquatic organisms during 1 year and 100 year return 24 hour storm events and will not be used on the proposed golf course).

Ciguatera Toxin

Ciguatera toxin can accumulate in reef fish under certain circumstances. If the reef fish are consumed by humans, illness and death can result. Although outbreaks of ciguatoxin have been documented since 1606, the causes for these outbreaks are not known. However, experimental and field data indicate that turf management of golf courses is not the cause.

6.3.3 POTENTIAL MITIGATION MEASURES

Keola will fully comply with the State Department of Health's 12 conditions applicable to new golf course developments, including the establishment of baseline ground water data and the implementation of an approved ground water monitoring plan and system.

The greens will be constructed according to United States Golf Association specifications, and the greens drainage will be conveyed to a dissipative environment such as the surface of a rough area and away from streams and gullies.

An Integrated Golf Course Management Plan (IGCMP) has been developed and will be adhered to (Appendix E). The IGCMP is extensive and detailed, and is based on the principle of integrated pest management (IPM). IPM practice uses a variety of cultural, mechanical, biological, and chemical methods to control insect, disease, and weed pests. The IGCMP also establishes pest infestation guidelines for pesticide application; i.e., insect and disease density thresholds below which pesticide application may not be necessary. Actual pesticide usage may be up to one-half of the amounts projected in the IGCMP and no pesticides are recommended for total area coverage, i.e. blanket treatment.

Approximately 70 percent of the nitrogen fertilizer that will be used will be in the slow-release form. In this form, nitrate-nitrogen is much less likely to impact ground water and surface water than more conventional quick-release, water soluble forms.

The Bermudagrass turf species that will be used have been selected because of their disease resistance, salt tolerance, weed and insect resistance, low water usage, production of a good playing surface, and other factors.

The IGCMP also provides guidance on safe handling, storage, and disposal of turf chemicals.

6.4 STREAM AND MARINE ENVIRONMENTS

A study on the biological and water quality of fresh water and marine environments was conducted by AECOS, Inc. to assess probable impacts associated with the project. Their report is summarized below and included in its entirety in Appendix F.

6.4.1 EXISTING CONDITIONS

6.4.1.1 Fresh Water Environments

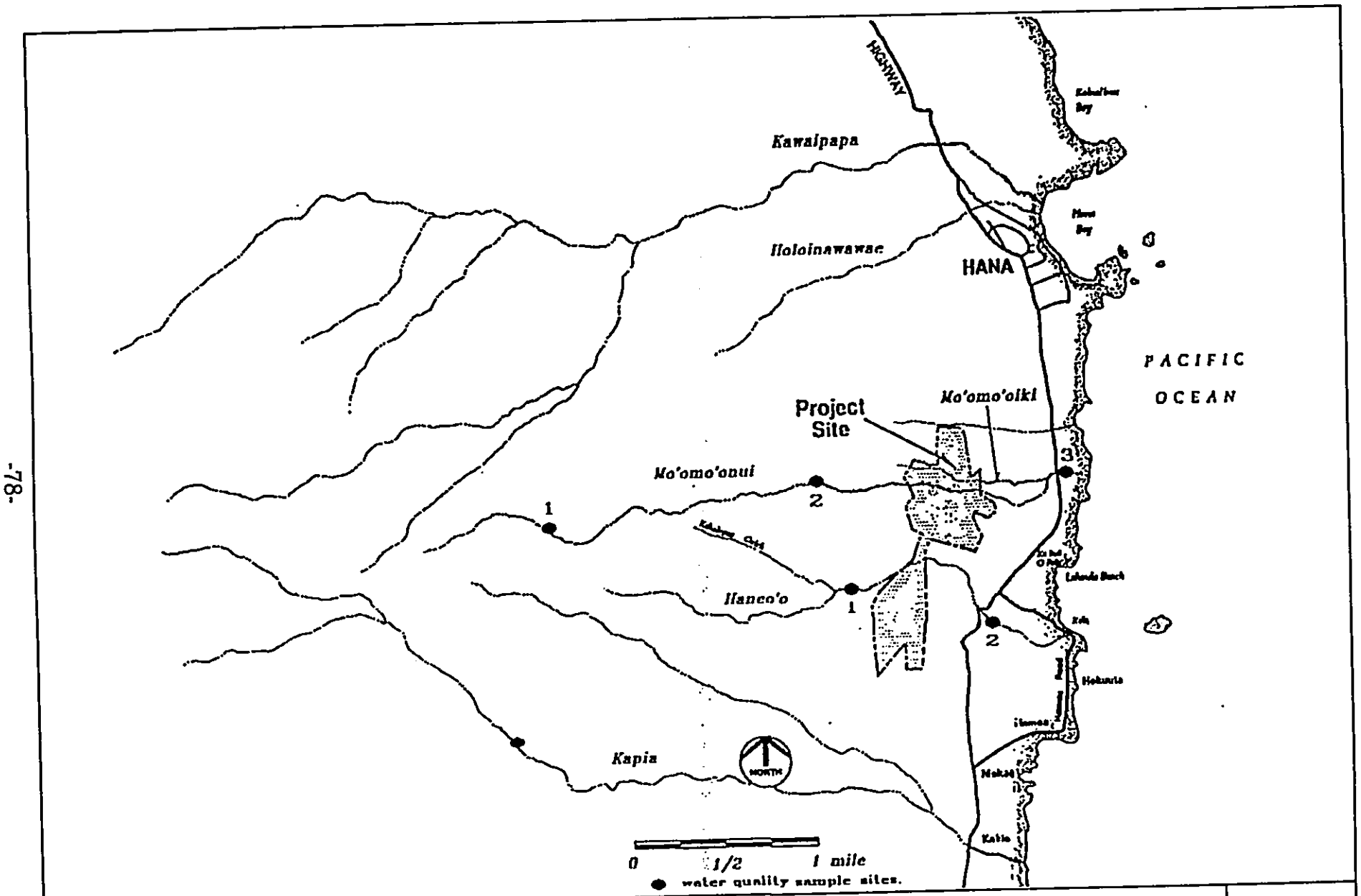
Haneo'o, Mo'omo'onui and Mo'omo'oiki Streams, and an unnamed stream are located in the project area as shown in Figure 6.4.1. The unnamed gulch and Mo'omo'oiki Stream are intermittent streams that only flow during periods of heavy rainfall.

Haneo'o Stream

With headwaters around 2,200 feet, Haneo'o Stream is one of the smaller streams in the Hana area. This stream clearly seems to be intermittent, and not "possibly interrupted" as listed by Timbol & Maciolek or "perennial and interrupted" as listed by the Commission on Water Resource Management (1990). Pools of various sizes were present all along the stream's length above 800 feet elevation, but these were not connected by surface flow during the February observation period.

Mo'omo'onui Stream

Mo'omo'onui Stream is listed by Timbol and Maciolek (1978) as interrupted. This stream arises from numerous small branch streams draining the slopes of cinder cones at the 3,000 to 3,400 feet elevations. The drainage from higher elevations on these slopes of Haleakala tends to be intercepted by headwaters of either Kapia or Kawaipapa Streams. The headwaters of Mo'omo'onui are within the cloud zone, thus, the stream might be expected to be perennial in the upper reaches.



PACIFIC PLANNING & ENGINEERING, INC

Source: AECOS

Stream Systems and Water Quality Sample Sites

Figure 6.4.1

At the 2,800 foot level, the stream has cut a narrow channel through the basalt within the cloud zone. Water is present as a series of disconnected pools on the order of one to several meters long, by 0.5 to 1 meter wide by 0.3 meter deep. Many small side streams, most carrying only a trickle of water, coalesce to form Mo'omo'onui Stream, which carries a small flow of water around the 2,700 foot elevation.

The first cataract of appreciable size (over 10 meters high) is found near the 2,600 foot level beside the cinder cone remnant called Koaekea. A large pool is present at the base of the waterfall, but stream flow is normally only a trickle over the falls. A series of large pools occur down stream from this point, but these are no longer connected by flowing water, i.e., the stream has become influent under low flow conditions and would be defined as "interrupted." The stream bed gradually widens below the falls, reflecting the coalescing of small side streams and the occasional periods when heavy rains produce tremendous torrents which move down these slopes.

In some cases, on Mo'omo'onui as well as other streams observed, plunge pools appear to have broken into either lava tubes or into very permeable strata. Even under conditions of modest stream flow from above, water flow would be interrupted at these points except during exceptional freshets. In these cases, the plunge pool features are physically deep relative to the stream bed immediately down stream, and contain much accumulated bed load material (boulders, cobble, and sand), but are dry.

Stream Biota

The only animals observed within the perennial section and isolated pools of Mo'omo'onui Stream above 2,100 feet elevation were dragonfly naiads. Both dragonflies and damselflies were common around the stream.

Dragonfly naiads were abundant everywhere water could be found in Haneo'o and Mo'omo'onui Streams except for the lowest elevation pools. Tadpoles and young frogs (Rana catesbiana) were present in both streams in the large pools located at lower elevations (i.e., within or just above the project site).

While no native stream fishes were observed in Mo'omo'onui, a single o'opu alamo'o (Lentipes concolor) was observed in Kapia Stream, far from the project site, at an elevation of 2,200 feet. No other fishes, neither introduced (exotic) nor indigenous species, were observed in the streams surveyed.

Statewide Stream Assessment

The Hawaii Stream Assessment (Commission on Water Resource Management, 1990) is a compilation of existing information on Hawaii's perennial streams of which both Haneo'o and Mo'omo'onui are listed. However, neither is included among the streams with important aquatic resources (i.e., native fauna and habitat) in the aquatic resources inventory and assessment section. In the section on riparian (stream side) resources, Mo'omo'onui is listed as being 10 percent within native forest, associated with a wetland, and showing damage from pigs (the latter detriment also cited for Haneo'o). All of these "factors" apply to segments of the streams well above the project site.

Stream Water Quality

Water quality samples were collected from six locations of streams in the Hana area as shown on Figure 6.4.1. These samples included two from higher elevation sites where some stream flow was occurring on Kapia and Mo'omo'onui Streams, and four samples from isolated pools on Haneo'o and Mo'omo'onui Streams at elevations below 1,000 feet. Two of the lower elevation samples were from large pools located in areas accessible to cattle above the project site, and two samples from small, shallow pools below Hana Highway (downstream of the project site).

The results of water quality analyses are presented in Table 6.4.1. The samples from the highest elevation locations (Kapia Stream and Mo'omo'onui Stream Station No. 1) showed nearly identical pH, turbidity, and NFR values, but differed considerably in the concentrations of various forms of nitrogen. High nitrate values (Kapia Stream) are not necessarily unusual.

Nitrate plus nitrite values were low for all isolated pools of water at lowland locations. The relatively high total N and total P values from the small, stagnant pools probably represent ongoing biological processes working on various nutrient inputs from an earlier period when water flow occurred and/or the breakdown of organic matter deposited in the pool.

Table 6.4.1. Water Quality Measurements From Stream Pools

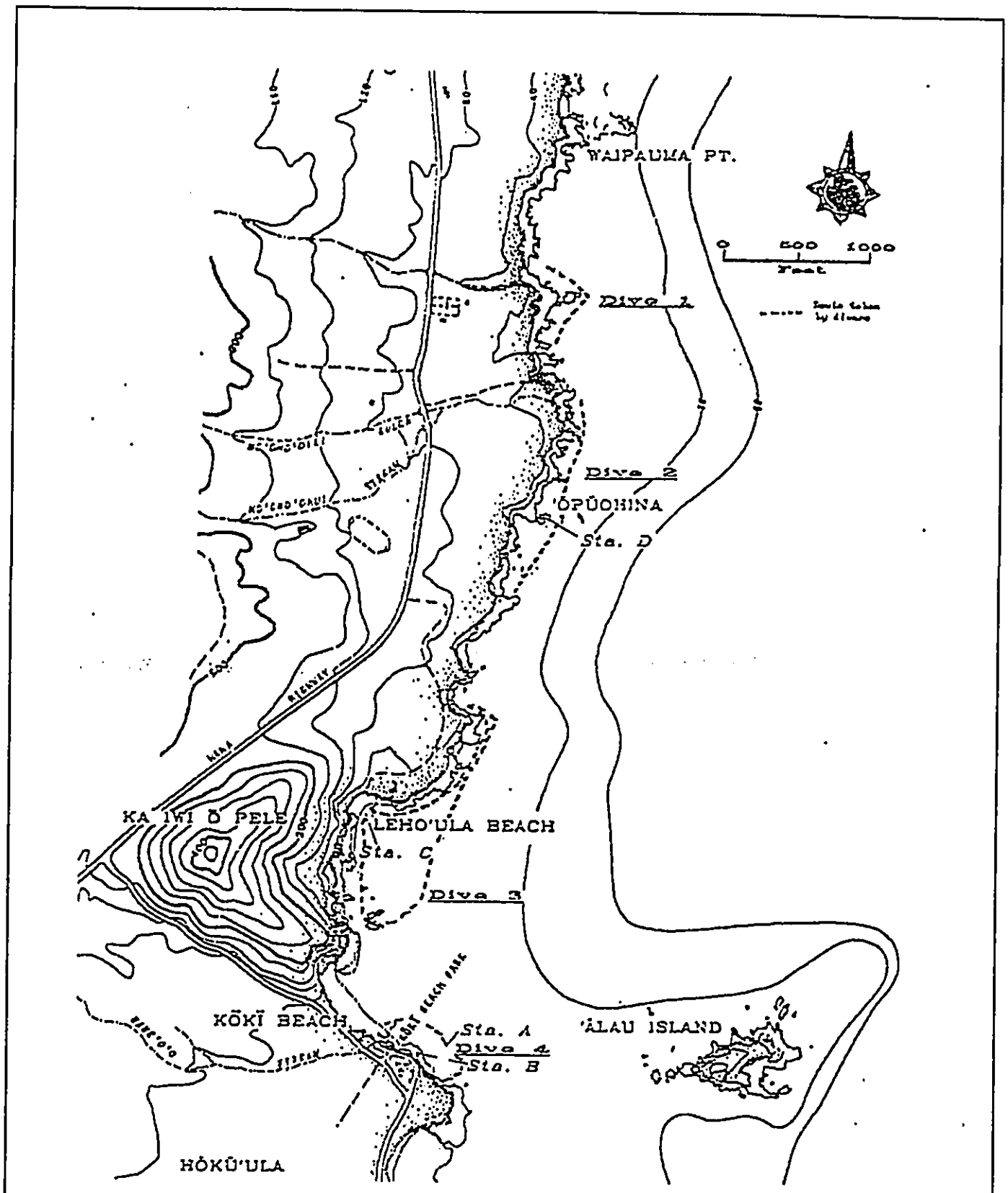
Stream	Kapia	Mo'omo'onui			Haneo'o	
Station		1	2	3	1	2
pH	7.0	7.1	7.1	6.7	7.1	6.9
Turbidity (NTU)	0.6	0.6	2.0	1.7	0.8	0.9
NFR (mg/L)	0.33	0.36	1.8	3.4	2.2	0.8
Nitrate+nitrite (ug N/L)	64	2	<1	2	1	1
Ammonia (ug N/L)	6	19	1	17	4	27
Total nitrogen (ug N/L)	110	186	105	722	220	522
Total phosphorus (ug P/L)	<1	1	4	40	12	15

Source: AECOS, Inc.

6.4.1.2 Marine Environments

The nearshore area from north of the Mo'omo'onui Stream mouth to just south of Koki Beach Park was surveyed as shown on Figure 6.4.2. Observers noted the type of substratum, characteristic and relative abundance of bottom cover and prominent benthic organisms, and rated all species of fishes noted as 1 (rare), 2 (present), 3 (common), and 4 (abundant).

Two principal environments occur in the study area: 1) the rugged open coastline extending north of Leho'ula Beach, and 2) the area within the embayment between Leho'ula and Koki Beaches. Both areas are exposed, high energy environments usually dominated by waves and seas generated by northeast tradewinds. Due to the highly turbulent conditions most of the time, a relatively low coverage of epibenthic and sessile organisms was found.



PACIFIC PLANNING & ENGINEERING, INC Source: AECOS	Marine Survey Areas and Water Quality Samples	Figure 6.4.2

The shoreline north of Leho'ula Beach is a series of small promontories of basalt with shallow seaward extensions separated by coves. The basalt shelves provide vertical relief and habitat in the subtidal and comprise the only substantial horizontal surfaces for intertidal organisms along this coast. The upper intertidal is dominated by the dense yellow growths of the alga, Ahnfeltia concinna (aki'aki), with the red algae, Pterocladia capillaea and Amansia glomerata, abundant in respective zones just below. From the upper intertidal downward to 25 feet depth the reef coral coverage in this usually highly turbulent area ranges from very low to approximately 15 percent, dominated by colonies of Pocillopora meandrina (5-10 percent) up to 1.5 feet in diameter.

The subtidal zone in the coves along the shoreline is in contrast to the promontories in that these boulder areas slope gradually seaward providing a less varied habitat. Reef corals or other sessile invertebrates are not common on the boulders, suggesting that they are frequently rolled around by the surf, preventing or interrupting settlement of young stages of benthic organisms. This unstable environment was even more apparent off the Mo'omo'onui stream mouth where all signs indicated the periodic offshore deposition of large amounts of debris from the stream during high runoff.

The benthic environment in the embayment between Leho'ula and Koki Beaches contrasted strongly with the open shoreline to the north. Most of the bottom throughout the bay is a mixture of calcareous white and basaltic black sand with no prominent macroinvertebrates. The surfaces are coated with a sand/algal turf throughout the bay, and coral coverage is low. Although the same species occur as are found further northward, coral abundance in most of the bay does not exceed five percent and is generally about one percent. All rocky surfaces within the bay appeared thoroughly scoured from wave driven sand, and this undoubtedly contributed to the low abundance of corals and other reef animals.

Fish Species

A total of 46 fish species were found, and 40 of these were sighted along the open coastline. Only 28 species were observed from the central to the north side of the bay off Leho'ula Beach, and only 13 on the south side of the bay off Koki Beach. Fish in this latter area were also less abundant as well as less diverse.

The most common fish sighted was the tang, Acanthurus leucopareius ("maikoiko"), which was rated very abundant both in and outside of the bay. Other abundant or very abundant species were Acanthurus triostegus ("manini"), Naso lituratus ("kala"), Thalossoma duperrey ("hinalea lau-wili"), Plectrogliphidodon imparipennis and P. sindonis, Kyphossus bigibbus ("nenue"), Mulloides flavolineatus ("weke"), M. vanicolensis ("weke ula"), and Parapeneus pleurostigma ("malu").

Ocean Water Quality

Water quality samples from the marine environment were collected at four stations as shown on Figure 6.4.2 and the analysis results are presented in Table 6.4.2.

While these sampled areas are potentially in waters influenced by streams draining the project site, conditions at the time of sampling were such that no stream influence on near shore waters was occurring. Nonetheless, salinities at all locations were depressed. Sea water should have a salinity around 34 to 36 parts per thousand (ppt), yet these samples ranged from 17 to 25 ppt. Ground water seepage occurs all along this coastline, and would have most likely influenced samples from Station "B" where the depth was shallow and the nearshore water somewhat confined by emergent boulders. The water quality results with respect to salinity, silicates, and nitrates (the latter are usually good indicators of groundwater efflux into coastal waters) corroborate the conclusion that groundwater efflux is occurring.

Table 6.4.2. Water Quality Measurements From Coastal Waters

Station	A	B	C	D
Salinity (ppt)	25	17	23	24
pH	8.0	8.2	8.2	8.2
Turbidity (NTU)	0.7	2.2	0.5	0.5
Nitrate+nitrate (ug N/L)	1	35	14	4
Ammonia (ug N/L)	10	9	4	14
Total nitrogen (ug N/L)	153	98	74	77
Total phosphorus (ug P/L)	10	33	13	8
Silicates (ug Si/L)	130	3980	840	710
Chlorophyll a (ug/L)	0.46	0.66	0.45	0.79

Source: AECOS, Inc.

The waters around the east end of Maui are classified as Class AA, and in the Hana area, quite probably fall within the open coastal "wet" criteria. However, the "208-Committee" report (DOH, 1977) classifies this particular area as a seasonally wet coast, more than likely because stream flows are absent during the drier months. The discharge of water from streams in this area is seasonal, but such discharges may account for only a small proportion of the total volume of fresh water entering the ocean along this coast.

The water quality measurements in relation to the State Department of Health's Water Quality (wet season criteria) suggests that the nutrient criteria are probably not exceeded in the ocean waters off this coastline, except very near shore where the discharge of fresh or brackish water occurs. Here, the nitrate plus nitrite criterion and possibly the total phosphorus criterion will be exceeded.

The "chlorophyll a" criterion, a measure of phytoplankton abundance, was slightly exceeded by all measurements made along the coastline. The slightly elevated values, however, are not considered to be a major problem.

6.4.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, there would be no changes to existing land uses on and near the project site and ranching operations would continue to contribute soluble nutrients to runoff and groundwater as described in Section 6.3.2.

Proposed Project

Fresh Water Aquatic Impacts

The project will not have significant direct impacts on existing fresh water aquatic environments because of the nature of these environments within the project area. Within the project area, fresh water habitats are mostly absent within the stream beds. Those bodies of water that do exist are either ephemeral (pools on impermeable rock, subject to drying up between rainfalls) or very isolated (pools maintained in depressions by ground water seepage). In either case, the fauna of these pools is limited to a few species, mostly introduced, that are only partly dependent upon the existence of the body of water (i.e., insects and amphibians which utilize the water for growth and development of juvenile stages).

The streams in the project site do not support native fresh water species nor do they appear to serve as migratory routes to perennial stream habitats in the upper reaches. The use of chemicals on the golf course is not expected to affect the stream water quality as discussed in Section 6.3.2.

The stream beds and gulches in the project site will not be altered. All cart paths that cross streams will be designed for occasional high peak stream flows and to minimize impacts to the streams. Keola will not stock the golf course's water features with fishes that may be harmful to native fauna in the area.

Marine Impacts

The project will not have significant direct impacts on existing nearshore marine environments. The golf course is located well inland from the shoreline, and the streams in the project area transport water to the ocean only during periods of heavy rainfall. The use of chemicals on the golf course is not expected to affect marine water quality as discussed in Section 6.3.2.

Furthermore, the potential for adverse impacts is reduced by the physical characteristics of the coastline and receiving waters. The substantial water motion from wind and waves, strong currents, and open coastal environments lacking shallow reef development all contribute to relatively short residence times in the nearshore waters. In other words, the ocean is well-mixed and does not retain materials in the immediate area that might lead to long exposure or bioaccumulation in the marine food chain.

Construction-Related Impacts

Impacts on water quality of the receiving waters for area runoff will be prevented or minimized by strict adherence to the types of temporary and permanent erosion control measures described in Section 6.10.3 or as specified by the Maui Department of Public Works.

If runoff does occurs notwithstanding the erosion control measures previously described, the effects would be short-term because waves and currents would move the fine sediment away from this coast fairly quickly, and little or no change in benthic assemblages would occur. Once the construction phase ends, the sediment content of runoff water from streams in the project area will be the same or less than at present, because soil erosion from a well maintained grassy turf is less than that from pasture land (Soil Conservation Service, 1985).

The implementation of the potential mitigation measures described in Section 6.3.3 will contribute to the maintenance of the existing stream and marine environments near the project area.

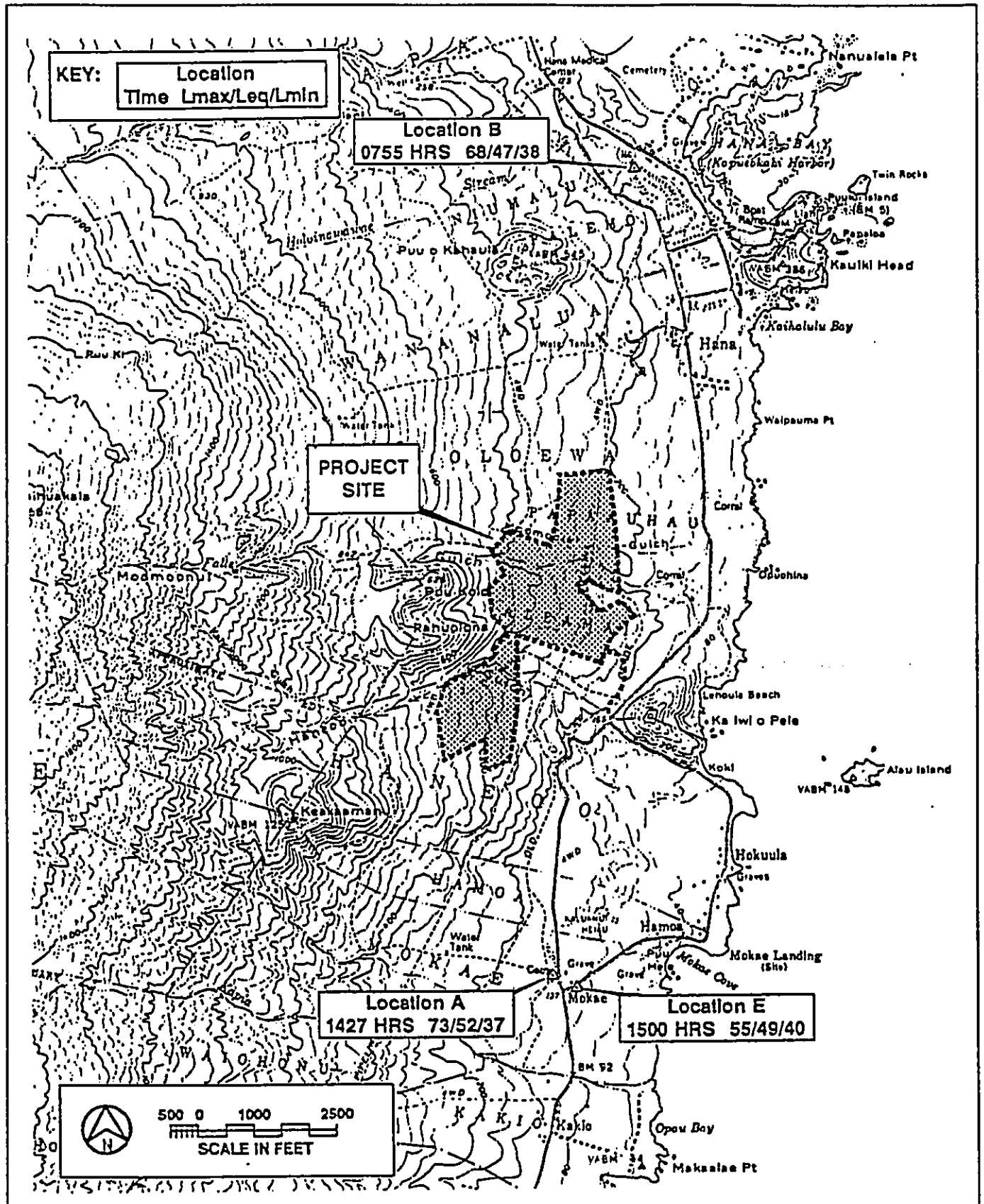
6.5 NOISE

A noise study was conducted by Y. Ebisu and Associates to describe the existing and future background noise levels in the environs of the project. Traffic noise level increases associated with the project were determined along the public roadways servicing the project site. Additionally, potential noise impacts from operations of the golf course and clubhouse activities, along with short-term noise impacts during construction were also evaluated. Their report is summarized below and included in its entirety in Appendix I.

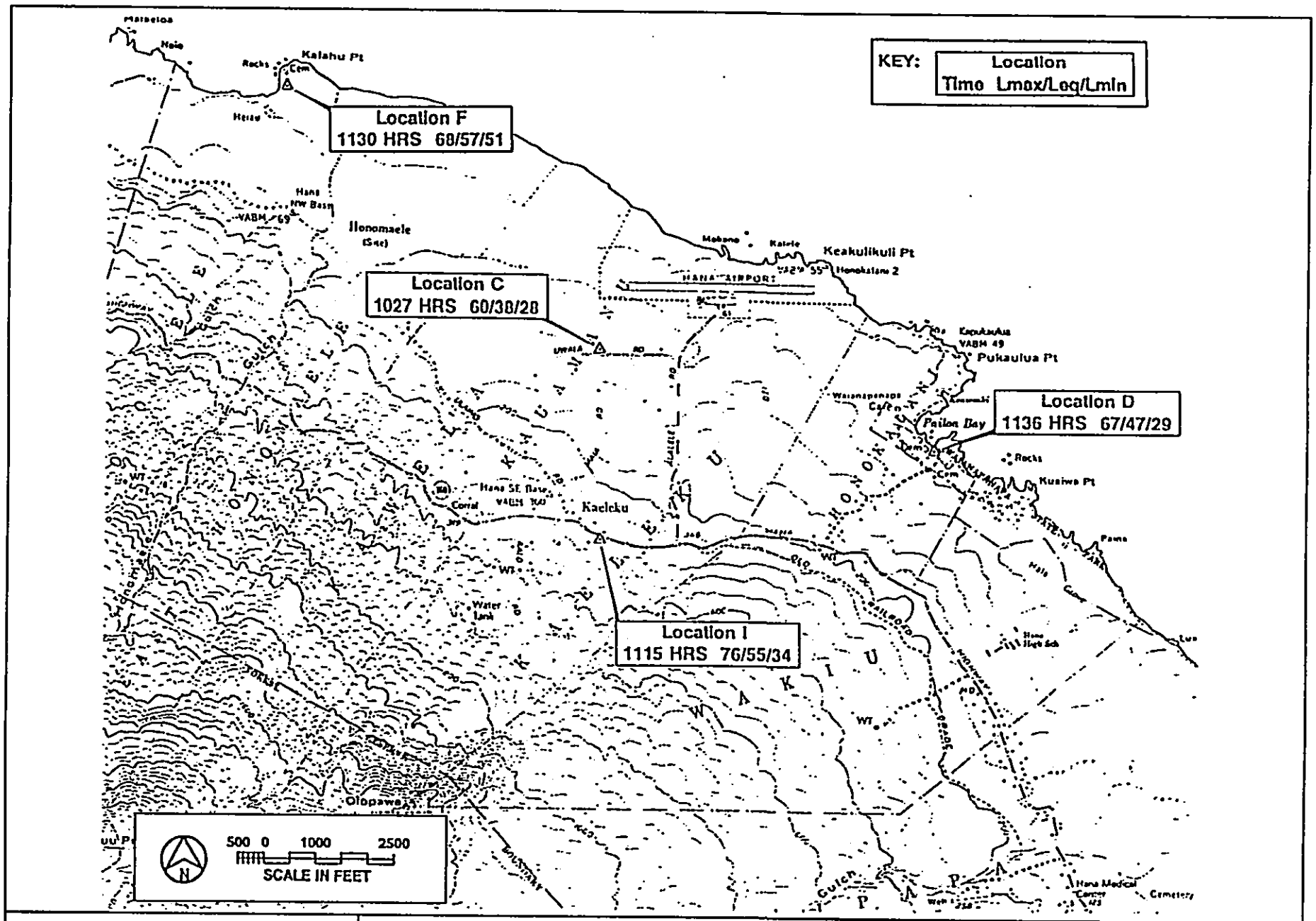
6.5.1 EXISTING CONDITIONS

The noise descriptor used by Federal agencies to assess environmental noise is the Day-Night Average Sound Level (Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. For the purposes of determining noise acceptability for funding assistance from Federal agencies (FHA/HUD and VA), an exterior noise level of 65 Ldn or lower is considered acceptable. This standard is applied nationally including Hawaii. For aircraft noise, the State Department of Transportation, Airports Division (DOT) has recommended that 60 Ldn be used as the common level for determining land use compatibility with respect to noise sensitive uses near its airports.

Existing traffic, aircraft, and background ambient noise levels were measured at seven locations along Hana Highway and near Hana Airport. These measurements were used to provide a basis for developing the traffic noise contours, aircraft noise levels at Hana Airport, and for describing the existing background noise levels in Hana. Figures 6.5.1 and 6.5.2 show the location sites where measurements were taken along with the maximum (Lmax), minimum (Lmin), and average (Leq) noise levels recorded at each of the sites.



PACIFIC PLANNING ENGINEERING, INC. Source: Y. Ebisu & Associates	Noise Measurement Location Sites	Figure 6.5.1



PACIFIC PLANNING & ENGINEERING, INC

Source: Y. Ebisu & Associates

Noise Measurement Location Sites (con't.)

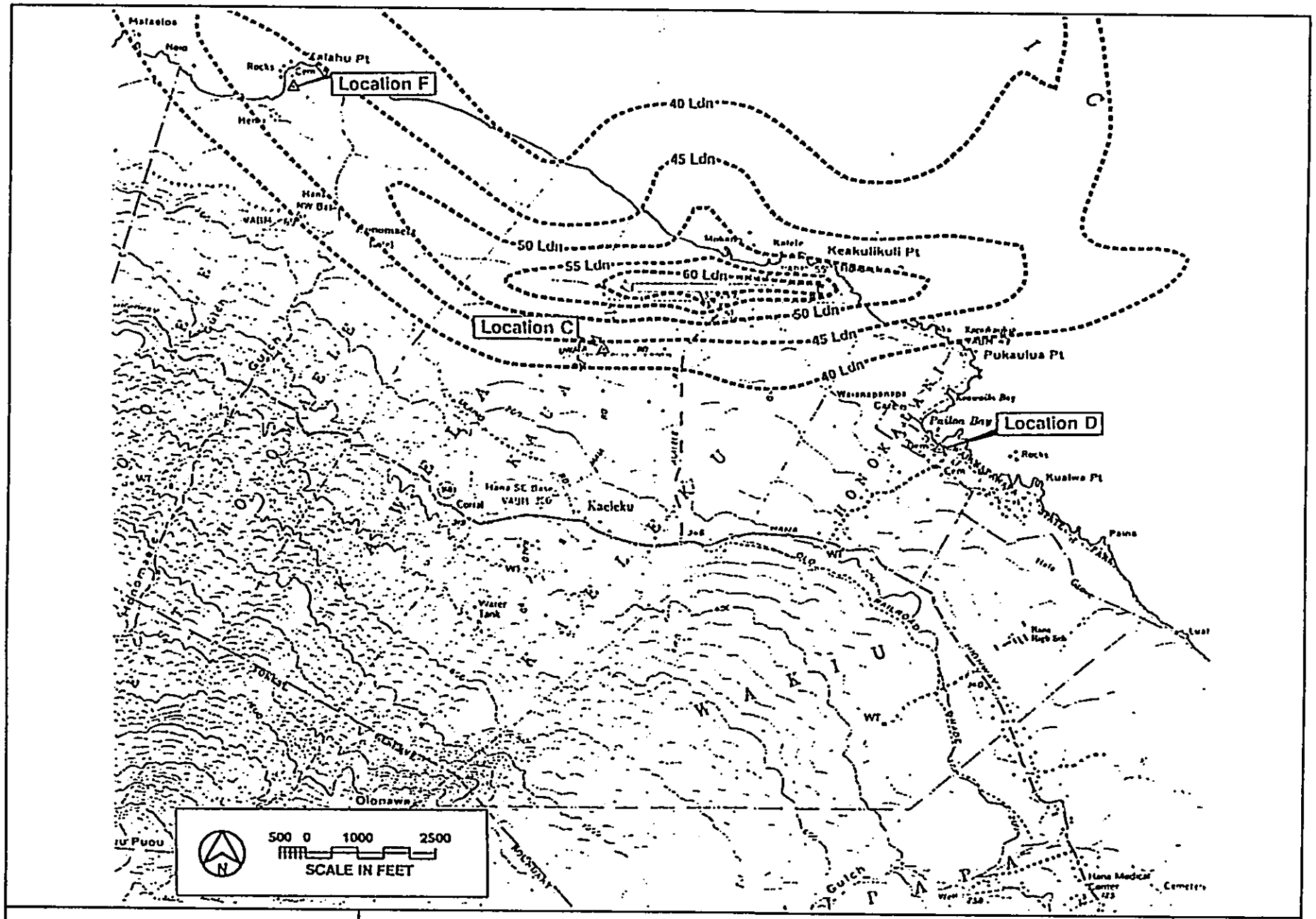
Figure 6.5.2

Because Hana can be characterized as a rural area, background noise levels are relatively low with average background noise levels typically less than 45 Ldn in areas removed from the surf or major roadways. The existing traffic noise levels in the project environs vary from levels of approximately 55 Ldn along Hana Highway, to less than 45 Ldn at the interior locations of the project site. The existing 55 Ldn traffic noise contour is located approximately 50 feet from the centerline of Hana Highway along sections north of the project, and 42 feet from the centerline along sections south of the project. Existing traffic noise levels at the interior portions of the project site are low (less than 45 Ldn) due to their large setback distances from the highway.

Aircraft noise sources in the vicinity of Hana Airport are associated with fixed and rotary wing aircraft operations at Hana Airport. Figure 6.5.3 depicts the locations of the 40 through 60 Ldn aircraft noise contours for 1989. The figure shows the 55 Ldn contour does not enclose noise sensitive properties around Hana Airport, therefore, airport noise levels are considered to be in the "Minimal Exposure, Unconditionally Acceptable" category.

6.5.2 PROBABLE IMPACTS

Traffic noise calculations for existing conditions as well as future conditions under the No-Action Alternative and the project were performed using the Federal Highway Administration (FHWA) Noise Prediction Model. The results of the traffic noise measurements taken at Locations "A" and "I" were compared with calculations of existing traffic noise levels to validate the computer model used. Aircraft noise measurements obtained at Locations "C," "D," and "F" were conducted to confirm that single event noise levels associated with aircraft operations at Hana Airport were consistent with the noise level predictions of the Federal Aviation Administration Integrated Noise Model (FAA INM), which was used to describe existing and future aircraft noise levels at Hana Airport. Expected noise levels from golf course play, maintenance activities, and clubhouse activities were also evaluated at the nearest noise sensitive properties.



PACIFIC PLANNING & ENGINEERING, INC

Source: Y. Ebisu & Associates

Existing Aircraft Noise Contours

Figure 6.5.3

Traffic Noise

Table 6.5.1 shows the existing and predicted traffic noise levels with the project along Hana Highway in the year 1995 and Table 6.5.2 presents the predicted increases by project and non-project related traffic.

Table 6.5.1 Existing and Predicted Traffic Noise Levels With Project
(1995 PM Peak Hour 50 Feet From Roadway Centerlines)

	Hourly LEQ in dB	
Location	1990 Existing	1995 With Project
Hana Highway toward Hana	56.0	58.1
Hana Highway toward Mokae	54.8	56.3
Haneoo Road with Hana Highway	47.6	47.6
Project Entrance Road	Not Applicable	50.4

Source: Y. Ebisu & Associates

Table 6.5.2 Calculations of Project and Non-Project Traffic Noise Contributors
(Calendar Year 1995)

	Noise Level Increases (Ldn)	
Street Section	Non-Project Traffic	Project Traffic
Hana Highway toward Hana	1.2	1.0
Hana Highway toward Mokae	1.5	0.0
Haneoo Road with Hana Highway	0.0	0.0
Project Entrance Road	Not Applicable	49.3

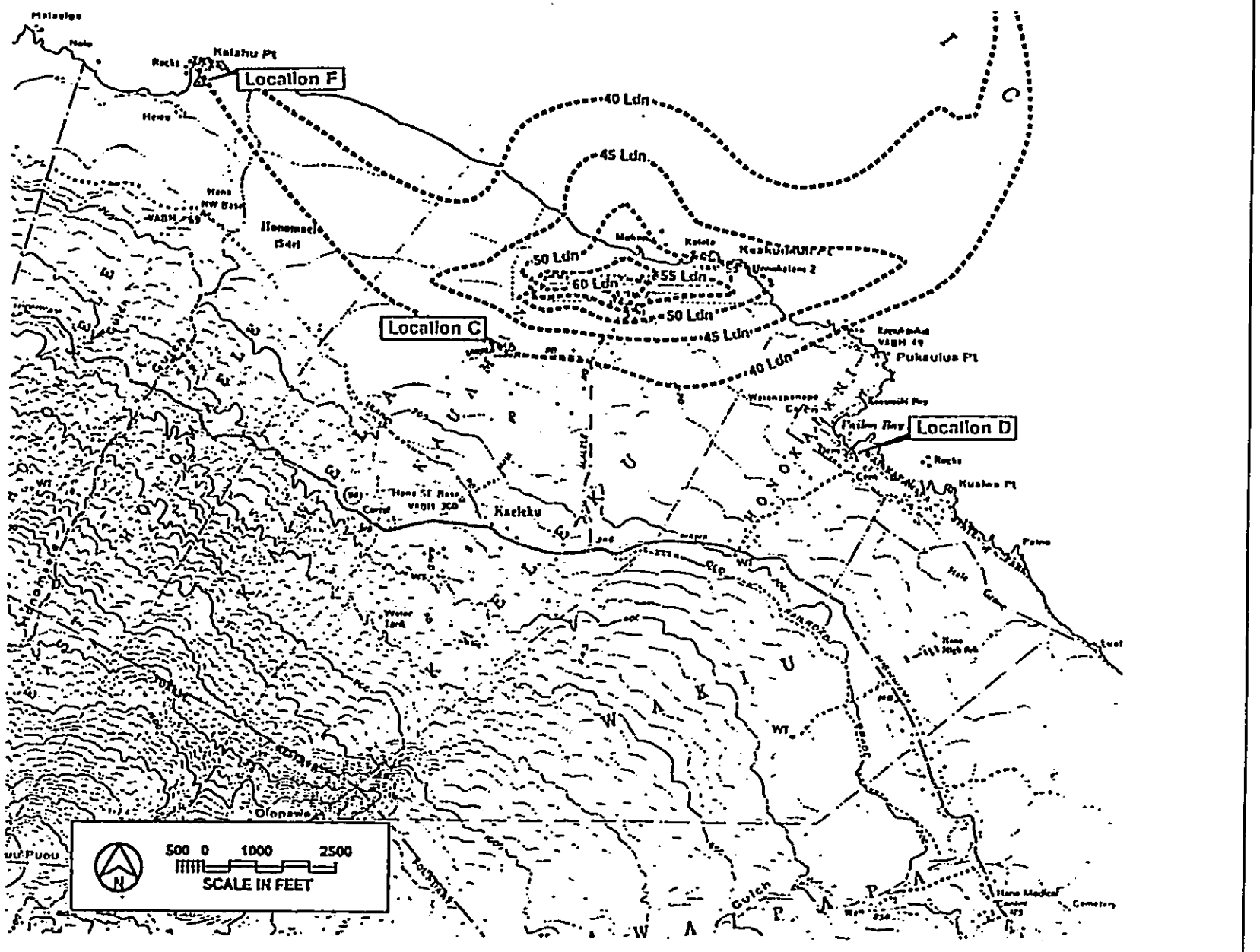
Source: Y. Ebisu & Associates

As indicated in Table 6.5.2, increases in traffic noise levels attributable to the project in the year 1995 are predicted to range from 0.0 to 1.0 Ldn along Hana Highway. These increases are slightly lower than those associated with non-project related traffic and is not considered to be significant. The section of Hana Highway north of the project, where traffic noise increases are expected to be the highest and where vehicle speeds are relatively high, is currently undeveloped. Project traffic is not expected to cause significant increases in noise along sections of Hana Highway south of the project or along Haneoo Road. The largest increases in traffic noise levels attributable to project traffic are expected to occur along the entrance road to the project site. Overall, these increases in noise levels are expected to be moderate to very low along Hana Highway, and are not expected to cause adverse noise impacts. Relatively small and temporary increases in traffic noise levels along Hana Highway are expected to occur during the construction period as a result of the additional shuttle traffic for construction employees. For these reasons, traffic noise impacts resulting from the project's traffic are not considered to be significant, and mitigation measures are not required.

Aircraft Noise

Aircraft noise levels will increase during the construction period due the planned use of charter aircraft services to transport construction workers to and from Hana Airport on a daily basis. Under worst case conditions, it was assumed that six daily DASH 7 aircraft flights would be required to transport construction workers in and out of Hana. The effect of these additional flights on aircraft noise contours at Hana Airport is shown in Figure 6.5.4.

The greatest increase in the noise contours are expected to occur under the aircraft flight tracks northwest and east of the airport. The magnitude of the increase is in the order of 5 to 10 Ldn, which are significant. However, noise sensitive properties should not be exposed to aircraft noise levels greater than 55 Ldn as a result of these charter flights. For this reason, it was concluded that although aircraft noise levels are expected to be significantly higher during the project construction period, the elevated noise levels should remain within the existing "Minimal Exposure, Unconditionally Acceptable" category at noise sensitive properties near Hana Airport.



PACIFIC PLANNING & ENGINEERING, INC

Source: Y. Ebisu & Associates

Aircraft Noise Contours with Project

Figure 6.5.4

Golf Course and Clubhouse Noise

Risks of adverse noise impacts from the proposed golf course are expected to be low due to the large distances (half mile) between the golf course and neighboring communities such as Hana or Hamoa. The loudest noise source associated with golf course operation is the tractor expected to be used for grounds keeping operations and recover golf balls on the driving range. Typical noise levels of these tractors range from 66 to 74 decibels (dB) at a 50 foot distance. At a half mile distance, predicted noise levels from these tractors are expected to range from 30 to 40 dB, which are equal to or less than existing background ambient noise levels at the quietest inland locations in Hana. A few residences may be within 500 to 1,500 feet of a fairway or green may have tractor noise levels between 57 to 68 dB, and will probably be audible. Keola will use properly muffled and maintained tractor equipment to minimize potential noise impacts from these tractors. In addition, Keola will investigate the feasibility of using landscaped berms and golf course features to attenuate tractor noise by 10 to 20 dB.

Group functions conducted at the proposed clubhouse may be audible at the nearest noise sensitive neighbors if amplified voice or music are used. Due to the relatively large buffer distance of approximately a half mile between the facility and the nearest noise sensitive neighbors, the predicted sound levels are expected to range from 29 to 41 dB, which are considered to be low. However, due to the low nighttime ambient noise levels in the Hana area, these activities may be audible during the night. Keola will investigate the feasibility of placing solid walls or other natural or man-made barriers and other sound attenuation measures between the function areas and the nearest noise sensitive neighbors to minimize noise levels at those locations.

Construction Noise

Audible construction noise will probably be unavoidable during the entire project construction period. The noise sensitive properties predicted to experience the highest noise levels during construction activities are the existing residences along Hana Highway near the old Hasegawa General Store site and near the south intersection of Haneoo Road with Hana Highway.

Noise levels during construction at these residences should not exceed 50 dB, which is well below levels which could interfere with speech communication or other indoor activities. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources and due to the exterior nature of the work. To minimize noise impacts, Keola plans to use properly muffled construction equipment and to follow the State Department of Health's construction noise limits and curfew times (which are applicable on the island of Oahu).

6.6 AIR QUALITY

An air quality study was conducted by B. D. Neal & Associates to describe existing air quality in the project area, and assess the potential short and long-term air quality impacts that could result from the project. Their report is summarized below and included in its entirety in Appendix H.

Ambient concentrations of air pollution are regulated by both national and State Ambient Air Quality Standards (AAQS). These standards, summarized on Table 6.6.1, have been established for six air pollutants which are particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead.

6.6.1 EXISTING CONDITIONS

Regional and Local Climatology

Regional and local climatology, such as wind, temperature, atmospheric turbulence, mixing heigh and rainfall, significantly affect the air quality of a given location. Although the climate of Hawaii is relatively moderate throughout the State most of the year, significant differences may occur from one location to another which are caused by the mountainous topography.

Hana is located on the windward coast of Maui on the lower eastern slope of Haleakala. This presence of Haleakala causes the trade wind streamlines to separate in the Hana area, and consequently winds tend to be lighter compared to other windward locations in the State. During the daytime, the winds usually flow from the northeast to the mountains (upslope), and during the nighttime, the winds are predominantly downslope from the west.

Table 6.6.1

Summary of State of Hawaii and National Ambient Air Quality Standards

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Suspended Particulate Matter	$\mu g/m^3$	Annual	-	-	60[a]
		24 Hours	-	-	150[b]
Particulate Matter[c]	$\mu g/m^3$	Annual	50	50	-
		24 Hours	150[b]	150[b]	-
Sulfur Dioxide	$\mu g/m^3$	Annual	80	-	80
		24 Hours	365[b]	-	365[b]
		3 Hours	-	1300[b]	1300[b]
Nitrogen Dioxide	$\mu g/m^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours	10[b]	-	5[b]
		1 Hour	40[b]	-	10[b]
Ozone	$\mu g/m^3$	1 Hour	235[b]	235[b]	100[b]
Lead	$\mu g/m^3$	Calendar Quarter	1.5	1.5	1.5

[a]Geometric mean

[b]Not to be exceeded more than once per year

[c]Particles less than or equal to 10 microns aerodynamic diameter

Source: B. D. Neal & Associates

At Hana Airport, the average daily minimum and maximum temperatures are 66° F and 81° F, respectively. Temperatures at the project site may be a few degrees cooler than at the Airport due to the slightly higher elevation.

Present Air Quality

Present air quality in the project area is mostly affected by air pollutants from natural, agricultural and vehicular sources. Natural sources of air pollution emissions which cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and volcanoes. Of these natural sources, volcanoes are the most significant with emissions (primarily of sulfur dioxide) periodically reaching the Hana area from the island of Hawaii due to the eruptions associated with the Kilauea Volcano.

Agricultural lands in the Hana area are primarily used for cattle grazing which cause little if any degradation of air quality except for minor occasional emissions of fugitive dust. Some contamination of the air in the project vicinity does result from the exhausts of motor vehicles along Hana Highway during peak traffic periods, however, significant levels of air pollution are unlikely because of the low volume of traffic.

The State Department of Health operates a network of air quality monitoring stations at various locations around the State. Very little data exist for the Island of Maui, and virtually none are available specifically for Hana. The only existing monitoring data near the project site is taken at Kihei (30 miles away) where measurements of sulfur dioxide, particulate and PM-10 are recorded as shown on Table 6.6.2.

Table 6.6.2

Annual Summaries of Air Quality Measurements From Monitoring Stations

Parameter / Location	1985	1986	1987	1988	1989
Sulfur Dioxide / Kihei					
No. of 24-Hr Samples	-	-	38	29	38
Range of 24-Hr Values (µg/m3)	-	-	11-107	<5-<5	<5-5
Average Daily Value (µg/m3)	-	-	28	<5	<5
No. of State AAQS Exceedances	-	-	0	0	0
No. of National AAQS Exceedances	-	-	0	0	0
Particulate / Kihei					
No. of 24-Hr Samples	34	11	-	-	-
Range of 24-Hr Values (µg/m3)	16-190	32-167	-	-	-
Average Daily Value (µg/m3)	54	61	-	-	-
No. of State AAQS Exceedances	4	1	-	-	-
No. of National AAQS Exceedances	2	1	NA	NA	NA
PM-10 / Kihei					
No. of 24-Hr Samples	-	-	38	31	36
Range of 24-Hr Values (µg/m3)	-	-	11-107	8-48	9-51
Average Daily Value (µg/m3)	-	-	28	27	24
No. of State AAQS Exceedances	NA	NA	NA	NA	NA
No. of National AAQS Exceedances	-	-	0	0	0

Source: State of Hawaii, Department of Health

No exceedances of the State/national 24-hour AAQS for sulfur dioxide were recorded between 1987 and 1989. Kihei is much more developed than the Hana area, and thus air pollution levels in the project area are probably lower than those measured at Kihei.

At this time, there are no reported measurements of lead, ozone, nitrogen dioxide or carbon monoxide in the project vicinity. These are primarily motor vehicle related air pollutants. Lead, ozone and nitrogen dioxide typically are regional scale problems and concentrations of these contaminants generally have not been found to exceed AAQS elsewhere in the State. Carbon monoxide air pollution, on the other hand, typically is a microscale problem caused by congested traffic conditions.

6.6.2 PROBABLE IMPACTS

The primary potential long-term air pollution will arise indirectly from increased motor vehicle traffic. To evaluate the air quality impact of increased roadway traffic associated with the project, computerized emission and atmospheric dispersion models were used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Critical receptor areas in the vicinity of the project site were identified for analysis. Carbon monoxide was selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Table 6.6.3 summarizes the analysis results of the modeling study.

Table 6.6.3.
Estimated Worst-Case Carbon Monoxide Concentrations
In Milligrams Per Cubic Meter (mg/m3)

	Averaging Time	
Description	1-Hour	8-Hour
1990	0.9	0.4
Without Project in 1995	0.8	0.4
With Project in 1995	0.9	0.4
Air Quality Standard		
National	40.0	10.0
State	10.0	5.0

Source: B. D. Neal & Associates

No-Action Alternative

As shown in Table 6.6.3, the worst-case 1-hour concentration is projected to decrease slightly to about 0.8 mg/m^3 from present conditions near the intersection of Hana Highway with Haneoo Road (North loop). By 1995, the worst-case 8-hour concentration is predicted to remain near the present level of 0.4 mg/m^3. These 1-hour and 8-hour concentration levels would be well within both State and national AAQS.

Proposed Project

As shown in Table 6.6.3, the predicted worst-case 1-hour and 8-hour concentrations would remain at the present concentration levels of 0.9 and 0.4 mg/m3, respectively. These 1-hour and 8-hour concentration levels would also be well within both State and national AAQS.

Most of the fertilizers recommended for use will be in pelletized form and applied using fertilizer spreading equipment. Some minor emissions of fugitive dust may occur during application, but the potential for serious impacts on air quality will be minimal.

Pesticides are usually applied in liquid form using ground spray equipment. Drift from spray equipment can occur by two different means: vapor drift and droplet drift. Vapor drift occurs when a chemical vaporizes after being applied to the target area which may then be carried downwind to adjacent locations. The amount of vaporization that occurs depends mostly on the ambient temperature and the volatility of the pesticide being used. The chemicals which will likely be used will have a low volatility within the temperature range that occurs at Hana. Thus, vapor drift from the application of pesticides is not expected be a problem.

Physical droplet drift occurs when the wind moves spray particles away from the target spray area during application. Droplet drift is not expected to be a problem because the wind direction is primarily upslope (away from populated areas) during the day, pesticide applications will only be performed when wind speeds are less than 10 miles per hour, and a spray shroud will be utilized at all times. In addition, the following measures to control pesticide drift will be investigated further:

1. Using coarse nozzle and low pressure spray equipment
2. Using thickener additives
3. Using non-volatile or low-volatile chemicals
4. Applying at the lowest possible height and when the wind direction is away from populated areas
5. Applying during periods when temperatures are cooler, humidities are higher, and when ground-based temperature inversion conditions are absent
6. Maintaining adequate buffer distance (at least 100 feet) between the sprayer and populated areas
7. Planting trees and shrubs around the golf course perimeter to intercept drift at the property boundary

Short-term direct and indirect impacts on air quality could occur due to construction activities. The two potential types of air pollution emissions are fugitive dust from vehicle movement and soil excavation and exhaust emissions from on-site construction equipment. The State of Hawaii Air Pollution Control Regulations prohibit visible emissions of fugitive dust from construction activities at the property line and an effective dust control plan to meet these regulations will be developed.

On-site mobile and stationary construction equipment will also emit some air pollutants in the form of engine exhausts. The majority of this equipment is usually diesel-powered resulting nitrogen oxides emissions. However, the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

6.7 BOTANICAL RESOURCES

A botanical survey was conducted by Char & Associates to describe the major vegetation types, inventory flora, and to search for threatened and endangered plant species protected by Federal and State laws. Their report is summarized below and included in its entirety in Appendix J.

6.7.1 EXISTING CONDITIONS

The vegetation on the project area consists primarily of pasture land dominated by introduced grass and sedge species. On the north half of the project area, the dominant pasture grass is Pangolagrass (Digitaria decumbens) which forms a rather smooth, rolling, matted cover. On the south half of the project area, the primary pasture grass is African dropseed which is a wiry, clumping grass that does not provide good forage except while young. Common sedges include Fimbristylis dichotoma, Pycreus polystachyos, and green kyllinga (Kyllinga brevifolia).

The more stony portions of the project site, especially the south half, support a mixed shrubland composed primarily of guava shrubs and Christmas berry (Schinus terebinthifolius) along with other introduced shrub and tree species. The Kaholopoo, Moomoonui and two unnamed gulches running through the project site generally contain mixed shrubland vegetation, and stands of large kukui trees in various locations.

Of a total of 126 plant species occurring on the site, 100 (79%) are introduced or alien; 10 (8%) are originally of Polynesian introduction; and 16 (13%) are indigenous, that is, native to the Hawaiian Islands and elsewhere throughout the Pacific. No endemic plants, (i.e. native only to the Hawaiian Islands), occur on the site. The U. S. Fish and Wildlife Service did not officially list any threatened and endangered plants in 1989, nor did they propose or identify any candidate plants for such status in 1990 for plants in the project area.

No wetlands as defined by the Corps of Engineers Wetlands Delineation Manual, published in January 1987 occur on the project site.

6.7.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, the existing cattle operations would continue on the project site and there would be no significant changes to existing botanical resources.

Proposed Project

The project is not expected to have a significant negative impact on the botanical resources in the project area. The vegetation on the site consists primarily of pasture land and is dominated by introduced or alien plants which are of little botanical interest or concern.

To minimize soil erosion during construction, a buffer zone of at least 50 feet will be maintained along the edges of the streams and gulches. Trees and shrubs in the gulch areas will be maintained as much as possible. Furthermore, the golf course landscaping will incorporate as much of the existing pasture land and mixed shrubland vegetation as possible to maintain and blend in with the surrounding pasture lands.

6.8 AVIFAUNA AND MAMMAL RESOURCES

An avifauna and feral mammals survey was conducted by Mr. Phillip L. Bruner. The objectives of the survey were to document the bird and mammal species occurring on the project site, their relative abundance, the presence of native fauna particularly those considered "Endangered" or "Threatened," any special habitats, and to determine which aspects of the project could affect wildlife. The report is summarized below and included in its entirety in Appendix K.

6.8.1 EXISTING CONDITIONS

Most avifauna species that would be expected in the type of environment the project area provides were found. The few species not recorded, but potentially possible, may be uncommon or even absent from the area. No endangered species were found or would likely occur in the project area.

The only resident endemic (native) bird recorded during field observations was the Short-eared Owl or Pueo (Asio flammeus sandwichensis). This species is listed by the State as endangered on Oahu but is still relatively common on Maui. No other endemic birds were recorded nor would any likely occur given the location of the project site and the nature of the habitats available to birds.

Of all the migratory indigenous (native) birds which winter in Hawaii, the Pacific Golden Plover (Pluvialis fulva) is the most abundant. A total of 45 plovers were recorded over a two day survey period. Given the amount of usable space and the possibility of counting the birds more than once, the observed number of plovers is reasonable. No resident indigenous (native) birds were found during the survey.

Two resident indigenous (native) seabirds - White-tailed Tropicbirds (Phaethon lepturus) were seen flying over the property on their way out to sea. This species nests on cliff faces, and other seabirds are not likely to nest in the project area due to the abundance of ground predators.

A total of eleven species of exotic (introduced) birds were recorded during the field survey. The species observed are listed in Table 6.8.1.

Table 6.8.1. Exotic Species of Birds Recorded

Common Name	Scientific Name	Number Observed
Ring-necked Pheasant	Phasianus colchicus	4
Spotted Dove	Streptopelia chinensis	3
Zebra Dove	Geopelia striata	2
Hwamei	Garrulax canorus	8
Common Myna	Acridotheres tristis	17
Northern Mockingbird	Mimus polyglottus	1
Northern Cardinal	Cardinalis cardinalis	2
Eurasian Skylark	Alauda arvensis	10
Japanese White-eye	Zosterops japonica	11
Nutmeg Mannikin	Lonchura punctulata	6
House Finch	Carpodacus mexicanus	3

Source: Phillip L. Bruner

The only feral mammals observed were several Small Indian Mongooses (Herpestes auropunctatus). No rats, mice or cats were recorded, but it would be highly unusual if they did not occur on the property. Evidence of feral pigs were abundant in the forest mauka of the project area. No endangered feral mammals were recorded.

6.8.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, the existing cattle operations would continue and there would be no significant changes to existing avifauna species and habitats.

Proposed Project

The project area contains a restricted array of habitats and thus supports a limited range of fauna. No special or unique habitats, or permanent wetlands were discovered in the project area and, thus, the project will have limited impact on the fauna in the area.

Avifauna species which may decline in abundance in the project area due to the development of the golf course and the loss of a tall grass pasture include: the Ring-necked Pheasant (Phasianus colchicus), Eurasian Skylark (Alauda arvensis), and Nutmeg Mannikin (Lonchura punctulata). Species that will likely increase due to the presence of a golf course and facilities include: the Pacific Golden Plover (Pluvialis fulva) and the House Sparrow.

The planned water features for the golf course could benefit native waterbirds by providing cover in the form of emergent vegetation and islands to nest in safety from mongooses and cats. If the water features become contaminated from pesticides or fertilizers, they could be potentially harmful to fauna. To prevent such contamination from occurring, linings will be installed around the ponds and surface drainage directed away from the ponds.

6.9 HISTORIC AND ARCHAEOLOGICAL RESOURCES

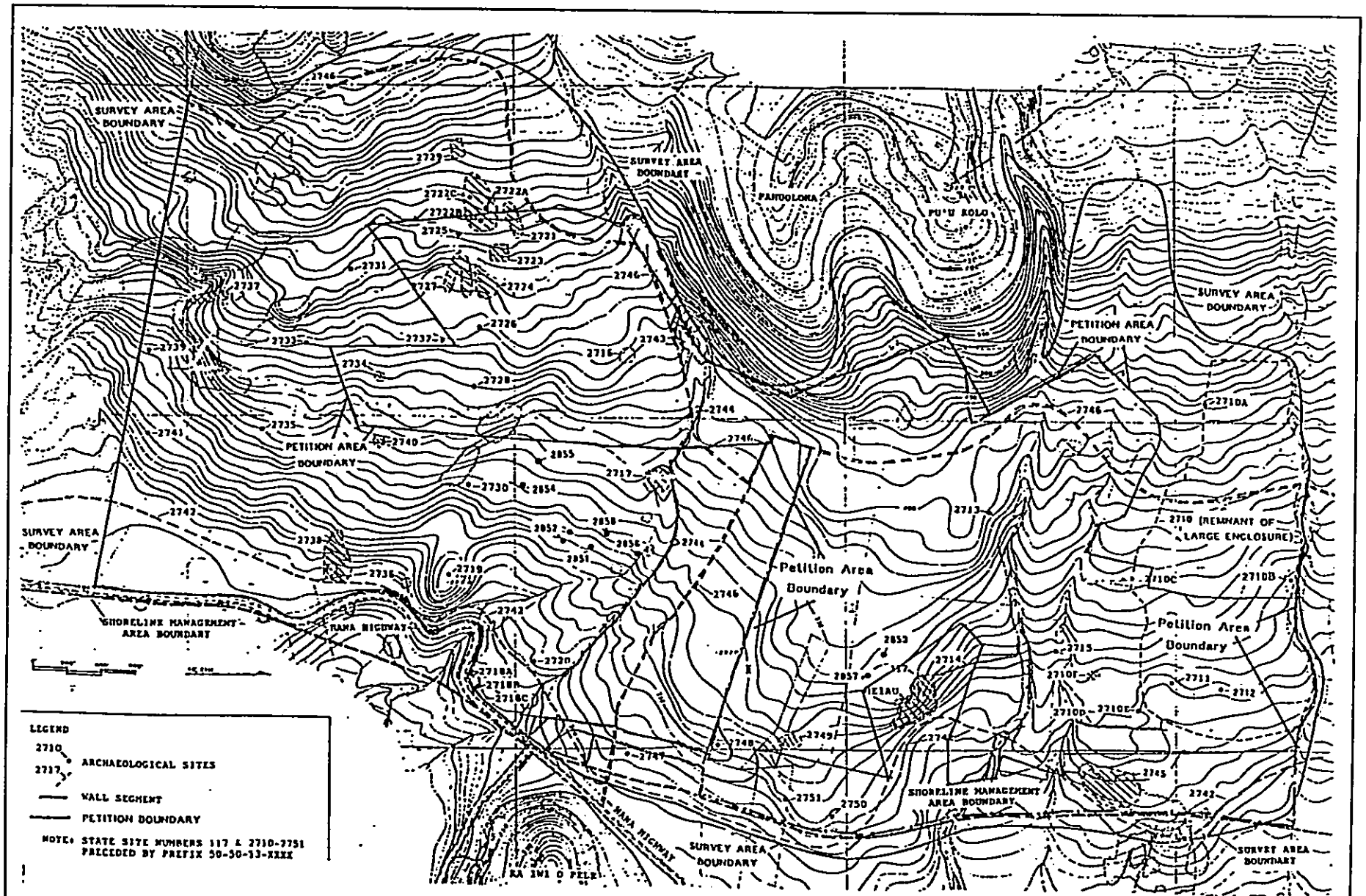
An archaeological inventory survey was conducted by Cultural Surveys Hawaii (CSH) to identify and document archaeological and historic sites in the project area, and to evaluate and recommend potential mitigation measures. Their report is summarized below and included in its entirety in Appendix G.

6.9.1 EXISTING CONDITIONS

An archaeological survey of approximately 400 acres of pasture land was conducted which included the 201 acre project site (referred to as the petition area). During the survey, 51 sites were located, of which 23 sites are located within the project site. Figure 6.9.1 identifies the sites located within the survey area and the project site. Temporary and State site numbers along with descriptions, probable ages, significance and tentative recommendations are presented in Table 6.9.1. Table 6.9.2 lists only those sites located within the project site. The survey area has been extensively modified by commercial sugarcane and cattle operations.

Historic and Prehistoric Designations

Of the sites shown on Table 6.9.1, 31 sites are of probable historic age and 19 sites are of probable prehistoric age. This historic age designation includes 2 probable habitation site remnants (sites 2747 and 2749) that may have been related to Land Commission Awards (LCA) within the project area. The remaining 29 sites of probably historic age have a probable agricultural function designation. Of these, 16 sites relate to farming which took place until at least the 1930's and 13 sites relate to sugar plantation or cattle operations.



PACIFIC PLANNING & ENGINEERING, INC

Source: Cultural Surveys Hawaii

Sites Located Within Survey Area and Project Site

Figure 6.9.1

Table 6.9.1 Sites Identified Within Survey Area With Tentative Recommendations

Significance Codes are explained below the table

State Site 50-50-13-	CSH #	Description (Probable Type)	Function	Probable Age	Significance	Tentative Recommendations
117	11	*heiau*	Religious	Prehistoric/ Historic	D,E	Preserve
2710	1,2,6, 8	Walls, Enclosure	Ag	Historic	D	Hist. Research Data Recovery
2711	4	Terrace Remnant	Habitation	Prehistoric	D	Preserve
2712	5	Terrace/ Mound/ Remnant	Habitation	Pre- historic	D	Preserve
2713	9	Terrace Remnant	Ag	Historic	D	Data Recovery
2714	10	Wall	Ag	Historic	D	Hist. Research Preserve
2715	12	Terrace Remnant	Habitation	Prehistoric	D	Preserve
2716	13	Terrace Remnant	Ag	Historic	D	Data Recovery
2717	14	Cave shelters	Habitation	Prehistoric	D	Data Recovery
2718	15	Cave Shelters	Habitation	Historic	D	Preserve
2719	16	Wall	Ind.	Pre- historic	D	Preserve
2720	17	Platform	Ag	Historic	D	Preserve
2721	18	Platform/ Terraces	Ag	Historic	NLS	No further work
2722	19	Platform/ Enclosure	Ag	Historic	D	Hist. Research Preserve

Source: Cultural Surveys Hawaii

Table 6.9.1 (con't.) Sites Identified Within Survey Area With Tentative Recommendations

Significance Codes are explained below the table

State Site 50-50-13-	CSH #	Description (Probable Type)	Function	Probable Age	Significance	Tentative Recommendations
2723	20	Platform/ Enclosure	Ag	Historic	D	Hist. Research Data Recovery
2724	21	Walls/Mounds	Ag	Historic	D	Data Recovery
2725	22	Mound	Ag	Historic	D	Data Recovery
2726	23	Platform	Ag	Historic	D	Data Recovery
2727	24	Mound/Walls	Ag	Historic	NLS	No further work
2728	25	Platform	Ag	Historic	NLS	No further work
2729	26	Platform/Enclosure/Terraces	Ag	Historic	D	Data Recovery
2730	27	Enclosure	Habitation	Pre- historic	C,D	Preserve
2731	28	Platform	water tank foundation	Historic	C,D	Preserve
2732	29	Lava tube	Non-cultural		NLS	
2733	30	Modified Outcrop	Ag	Historic	D	Data Recovery
2734	31	Terrace	Ag	Historic	D	Hist. Research Data Recovery
2735	32	Wall/Pavement/ Remnants	Habitation	Pre- historic	D	Preserve
2736	33	Enclosure/Ter-race	Ag	Historic	D	Preserve
2737	34	Terraces/Pits/ Wall	Ag	Pre- historic	D	Preserve

Source: Cultural Surveys Hawaii

Table 6.9.1 (con't.) Sites Identified Within Survey Area
With Tentative Recommendations

State Site 50-50-13-	CSH #	Description (Probable Type)	Function	Probable Age	Significance	Tentative Recommendations
2738	35	Terrace Remnants	Ag	Historic	D	Preserve
2739	36	Enclosure	Habitation / Ag	Pre- Historic	D	Preserve
2740	37	Terrace Remnants	Ag	Historic	D	Preserve
2741	38	Enclosures/ Terrace	Ag	Pre- Historic	D	Preserve
2742	39	Rairoad grade		Historic	ABCD	Selective Preservation
2743	40	Terraces/Alignments/Shelters	Ag/ Habitation	Historic	D	Data Recovery
2744	41	Wall	Ag Boundary	Historic	D	Hist. Research Selec. Preser-vation
2745	42	Wall/Terraces/ Mounds	Ag/Habita-tion / Burials	Pre- Historic	D,E	Preserve
2746	43	Roadway system		Historic	A	Selective Preservation
2747	44	Mound	Habitation	Historic	D	Data Recovery
2748	45	Wall Remnant	Ag	Historic	NLS	No further work
2749	46	Enclosure/ Terraces	Ag	Historic	D	Data Recovery
2750	47	Wall Remnant	Ag	Historic	NLS	No further work
2751	48	Terrace Remnant	Ag	Historic	NLS	No further work

Source: Cultural Surveys Hawaii

Table 6.9.1 (con't.) Sites Identified Within Survey Area
With Tentative Recommendations

State Site 50-50-13-	CSH #	Description (Probable Type)	Function	Probable Age	Significance	Tentative Recommendations
2851	49	Platform/Ter-race	Ag	Pre- historic	D	Data Recovery
2852	50	Terrace/ Paving	Ag/ Habitation	Pre- historic	D	Data Recovery
2853	117A	Terrace	Ag	Pre- historic	D	Data Recovery
2854	52	Walls/ Enclosure	Ag	Pre- historic	D	Data Recovery
2855	53	Enclosure	Ag	Pre- historic	D	Data Recovery
2856	54	Platform	Burial	Pre- historic	D,E	Preserve
2857	117B	Terrace/Rem-nants	Ag	Historic	NLS	No further work
2858	56	Enclosure/Rem-nant	Habitation	Pre- historic	D	Data Recovery

CODES FOR CRITERIA FOR SITE SIGNIFICANCE

A	Site reflects major trends or events in the history of the state or nation.
B	Site is associated with the lives of persons significant in our past.
C	Site is an excellent example of a site type.
D	Site may be likely to yield information important in prehistory or history.
E	Site has cultural significance; probable religious structures (shrines, *heiau*) and/or burials present.
NLS	No Longer Significant

Source: Cultural Surveys Hawaii

Table 6.9.2 Sites Identified Within Project Site
With Tentative Recommendations

State Site 50-50-13-	CSH #	Description (Probable Type)	Function	Probable Age	Significance	Tentative Recommendations
2710	1,2,6, 8	Walls, Enclosure	Ag	Historic	D	Hist. Research Data Recovery
2711	4	Terrace Remnant	Habitation	Prehistoric	D	Preserve
2712	5	Terrace/ Mound/ Remnant	Habitation	Prehistoric	D	Preserve
2713	9	Terrace Remnant	Ag	Historic	D	Data Recovery
2714	10	Wall	Ag	Historic	D	Hist. Research Preserve
2715	12	Terrace Remnant	Habitation	Prehistoric	D	Preserve
2716	13	Terrace Remnant	Ag	Historic	D	Data Recovery
2721	18	Platform/Terraces	Ag	Historic	NLS	No further work
2722	19	Platform/Enclosure	Ag	Historic	D	Hist. Research Preserve
2723	20	Platform/Enclosure	Ag	Historic	D	Hist. Research Preserve
2724	21	Walls/Mounds	Ag	Historic	D	Data Recovery
2725	22	Mound	Ag	Historic	D	Data Recovery

Source: Cultural Surveys Hawaii

Table 6.9.2 (con't.) Sites Identified Within Project Site
With Tentative Recommendations

State Site 50-50-13-	CSH #	Description (Probable Type)	Function	Probable Age	Significance	Tentative Recommendations
2726	23	Platform	Ag	Historic	D	Data Recovery
2727	24	Mound/Walls	Ag	Historic	NLS	No further work
2728	25	Platform	Ag	Historic	NLS	No further work
2734	31	Terrace	Ag	Historic	D	Hist. Research Data Recovery
2742	39	Rairoad grade		Historic	ABCD	Selective Preservation
2743	40	Terraces/Alignments/Shelters	Ag/ Habitation	Historic	D	Data Recovery
2744	41	Wall	Ag Boundary	Historic	D	Hist. Research Selec. Preservation
2746	43	Roadway system		Historic	A	Selective Preservation
2749	46	Enclosure/ Terraces	Habitation/ Ag	Historic	D	Data Recovery
2853	117A	Terrace	Ag	Prehistoric	D	Data Recovery
2857	117B	Terrace/Remnants	Ag	Historic	NLS	No further work

Source: Cultural Surveys Hawaii

The 19 probable prehistoric sites include religious, agricultural and habitation sites. Site 117, Koahaepali heiau, does contain historic-era artifacts, but continues to be designated prehistoric. Sites 2711, 2712, and 2735 are remnant-type features, but are designated probable habitation sites based on surface remains and manuports present. Sites 2737, 2739, and 2741 contain features of both agricultural and habitational function. Site 2719 (L-shaped wall) is listed as prehistoric based on wall construction style and is described as a possible shelter or defensive position.

Site Functions

The basic site function categories of the 51 sites are habitation, agricultural and religious functions.

Habitation Sites

Thirteen sites scattered across the survey area suggest, to varying degrees, habitational use. Based on excavations, historic research and observable characteristics, 3 are historic sites and 10 are prehistoric sites.

Agricultural Sites

This is by far the largest functional category of sites with 36 sites being solely or including agricultural features. The majority are of probable historic age with only the sites at the southern edge and the central portion of the survey area being of possible pre-historic age. The range of agricultural sites include: historic infrastructure-type features (i.e. railroad bed and water tank foundation); walls which probably relate to early (ca. 1850-1880's) cane cultivation and cattle exclusion; and terrace and mounds associated with sweet potato and taro cultivation which took place in the Haneoo portion of the survey area until the 1930's.

Religious Sites

Three sites (Koahaepali Heiau, a burial site, and a possible burial site) categorized as having religious connotations are located outside of the golf course project site. The Koahaepali Heiau (Site 117), recorded by Winslow Walker was tested. The results suggests that it was utilized historically for habitation. The main structure of Site 117 is also the largest remaining feature within the survey area. The other two features with religious connotations are a confirmed burial site (2856) consisting of two adjoining, low, paved platforms, and a possible burial site (2745).

6.9.2 PROBABLE IMPACTS

Keola is committed to incorporating the archaeological and historical sites located in the golf course project area into the project whenever possible, and will continue to work closely with the Hana Community and the applicable government agencies to achieve this objective. A data recovery plan will be developed and implemented in accordance with the applicable State Historic Preservation Division and other guidelines. In addition, a detailed preservation plan including provisions for buffer zones, protective measures during construction work, and long-term preservation measures will be developed, and must be approved by the State Historic Preservation Division and the Maui Planning Department. The foregoing agencies will verify that these plans have been successfully concluded.

6.10 NATURAL HAZARDS

The project will not contribute to any impacts related to natural hazards. However, natural hazards that could have an impact upon the project are volcanic eruptions, earthquakes, tsunamis and flooding.

6.10.1 VOLCANIC ERUPTIONS

Since 1790, there have been 12 reported volcanic eruptions in Hawaii with eleven of these occurring on the island of Hawaii. The remaining eruption occurred on Maui from the Haleakala Volcano in 1790, and is the only eruption known from this volcano. During this eruption, lava broke from two vents on the southwest rift zone of the volcano and poured into the sea at Makena. The characteristics of this eruption at Haleakala is typical of volcanoes expected in the final stages of volcanic activity with fairly infrequent eruptions[2].

The project will not effect current seismic monitoring activities at Haleakala crater and will not affect the Hawaiian Volcano Observer's ability to detect potential warning signs of volcanic activity. Potential damage to the project from an eruption will be limited to property damage associated with the golf course, clubhouse and related facilities.

6.10.2 EARTHQUAKE HAZARDS

Earthquakes most likely to affect Hana originate in two different areas: 1) the Molokai Seismic Zone, including the island of Maui, and 2) the Island of Hawaii. The Molokai Fracture Zone is a series of fractures in the sea floor that stretch from the Hawaiian Islands to Baja, California. Earthquakes with epicenters on or near the Island of Hawaii stem from both volcanic and tectonic activity.

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2 "Eruption isn't likely here, but one expert is cautious," The Maui News, Section A-1.

Analyzing earthquakes on a statistical basis, the Hawaii Institute of Geophysics[3] concluded that an earthquake of Magnitude 7 or greater could occur on East Maui on the average of once every 37 years. They estimated there is a 90 percent probability that an earthquake with a magnitude of 7 or greater will affect Hana before 2065. An earthquake of sufficient magnitude would cause property damage to the clubhouse and related facilities and may affect the golf course.

6.10.3 TSUNAMI AND FLOODING HAZARDS

Tsunamis have been observed and recorded on all major Hawaiian islands. Since 1946, significant tsunamis recorded on the island of Maui occurred in 1946, 1957, 1960, and 1964. Figure 6.10.1 shows the flood zones designations near the project site. The project site is located away from the coastline areas historically subject to tsunami inundation which are designated as Zone V23 (Areas of 100-year coastal flood with wave action) and should not be affected by tsunamis.

According to the Flood Insurance Map dated June, 1981, the project site is in Zone C which denotes an area of minimal flooding. Streams located within the project site are not designated as areas subject to 100-year flooding. Consequently, no flooding problems in the project area are expected. Flooding in the general vicinity of the project is limited to the coastline where 100-year coastal flooding from wave action may occur.

Earthwork for the project will involve a total of approximately 450,000 cubic yards of excavation and embankment. In the grading of the fairways, the amount of cut and fill will be balanced. All exposed slopes and areas will be grassed immediately after grading to control and mitigate soil erosion. Other temporary erosion control measures, such as erosion control berms, will be utilized during construction.

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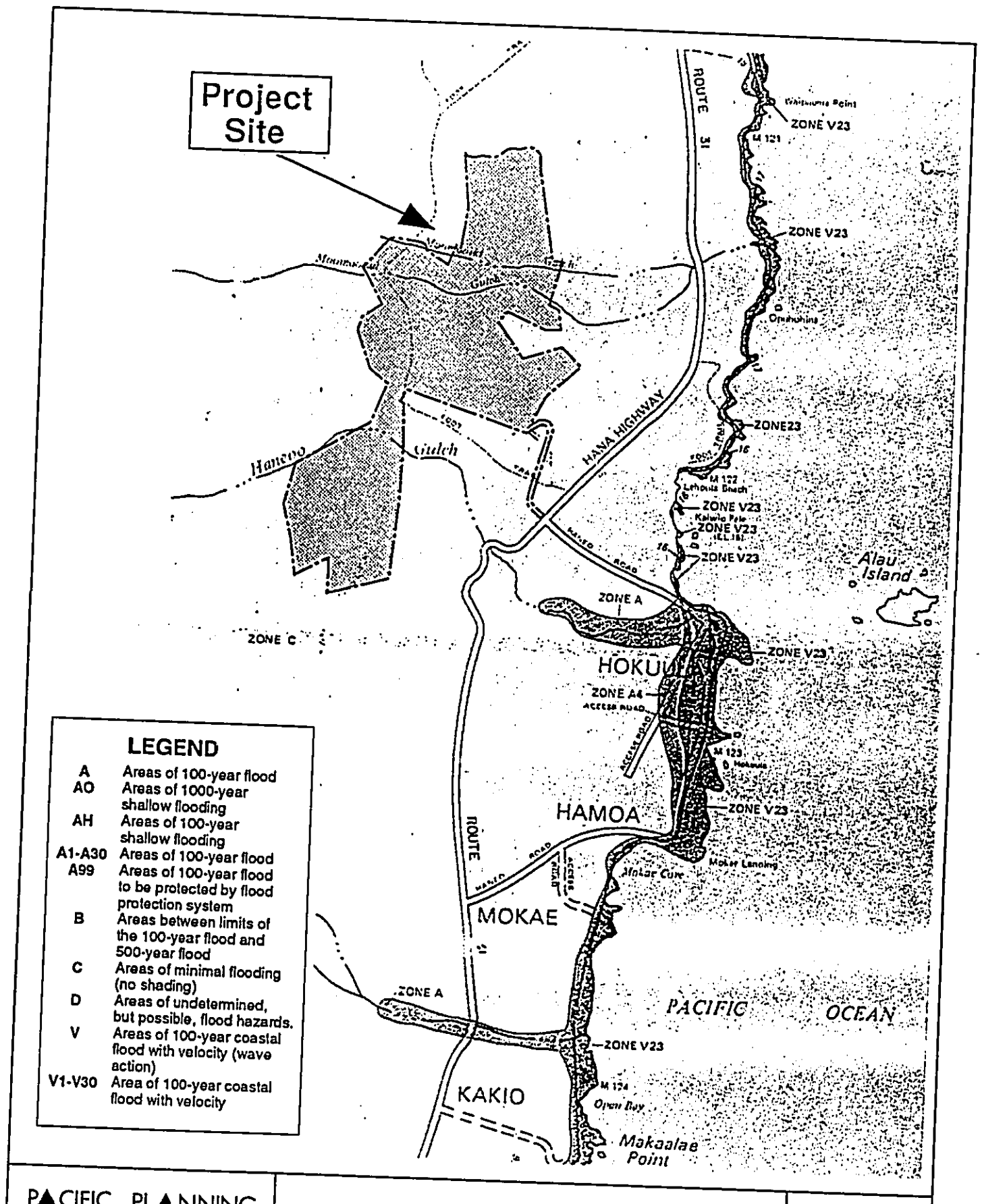
3 Furumoto, Augustine S., Nielsen, Norby N., and Phillips, William R., A Study of Past Earthquakes, Isoseismic Zones of Intensity, and Recommended Zones for Structural Design for Hawaii, Hawaii Institute of Geophysics, University of Hawaii, March 1973.



PACIFIC PLANNING & ENGINEERING, INC.

Source: Flood Insurance Rate Map Panel 320

Flood Zone Designations

Figure 6.10.1

The drainage system within the project will generally maintain the natural drainage pattern in the area. The Moomoonui and Haneoo Gulches, smaller drainageways, existing vegetation, natural slopes, and drainage patterns will be retained whenever possible. Natural storm water runoff will continue to flow through the existing drainage ways in the areas that will be retained as open space. These open space regions occur throughout the project and drain in the makai direction.

Overall on-site drainage is not expected to increase since the addition of impervious surfaces will be minimal and soil compaction from livestock will be eliminated. Slight increases in on-site runoff that may occur in specific areas will be drained via sheet flow. The permanent drainage system is expected to consist of culverts, headwalls, and other drainage structures. If necessary, small retention basins can also be constructed to control runoff and sedimentation. In addition to these improvements, there will be permanent ground cover, trees, and shrubs. These measures and others deemed appropriate will be implemented as necessary to minimize any potential flooding or erosion problems.

No increase in runoff or sedimentation in the coastal waters is expected from the project site. Impacts on water quality of the receiving waters for area runoff will be prevented or minimized by strict adherence to the types of temporary and permanent erosion control measures listed above or as specified by the Maui Department of Public Works.

6.11 VISUAL RESOURCES

Field surveys and research were conducted to determine the probable visual impacts resulting from the project. In evaluating probable visual impacts, the resource classification system and design principles described in the Maui Coastal Scenic Resources Study[4] (Scenic Study) were applied.

Seven design principles are described in the Scenic Study providing a framework for evaluating the quality of existing visual resources near the project site. These principles are:

1. Scale and Proportion. - Scale refers to the size of an object seen in relation to other objects while proportion is the size relationship of parts to a whole and to one another.
2. Unity and Variety. - Refers to the dynamic balance between the boredom of too much uniformity and the chaos of uncontrolled variety.
3. Repetition and Rhythm. - Refers to the recurrence of a design element providing continuity, flow and emphasis. Repetition may be exact or varied establishing a regular or irregular beat. Rhythm may provide variations on a basic theme or indicate a progressive development.
4. Balance. - Balance is the achievement of equilibrium bringing a sense or order and stability. The two basic types of balance are symmetrical and asymmetrical.
5. Directional Forces. - Implied or actual lines produce directional lines or forces which determine the basic structure of a scene.
6. Emphasis and Subordination. - Emphasis of certain features and subordination of others creating centers of interest for the viewer.
7. Contrast. - Contrast is the interaction of elements that express the dualities seen in opposites such as large and small or simple and complex.

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4 Maui Coastal Scenic Resources Study, prepared by Environmental Planning Associates, Inc., County of Maui Planning Department, August 31, 1990.

In order to assess probable impacts, these principles were further characterized in terms of either high, moderate, or low visual quality derived from the Coastal View Study (CVS) prepared for the City and County of Honolulu.[5] Photos included in the CVS characterizing high, moderate, and low visual qualities provided a framework for determining the visual measures. These values were used as qualitative measures to provide a frame of reference in determining the degree of visual significance associated with the resource.

6.11.1 EXISTING CONDITIONS

Coastal Land Forms

The large cinder cone of Puu Ka Iwi o Pele was determined to be a distinctive Coastal Land Form resource. This hill is situated makai (east) of the project site at the intersection of Hana Highway and Haneoo Road. Figure 6.11.1 shows the northern portion of it from Hana Highway. Puu Ka Iwi o Pele stands out as a distinct natural land form overlooking the coastline adding variety to the rural characteristics associated with the coastline. As a result, it was determined to have generally high visual qualities associated with all design principles.

Coastal View

The Hana coastline in the immediate vicinity of the project site located north and south of Puu Ka Iwi o Pele was determined to be a distinctive Coastal View. Figure 6.11.1 also provides a view of the coastline near Lehoula Beach from Hana Highway. The line of trees along the coast coupled with natural rural terrain and sloping landscape from Hana Highway create a contrasting and balanced view. Each of these features contribute some variety to the view helping emphasize the attractiveness of the ocean contributing to high visual qualities associated with the design principles.

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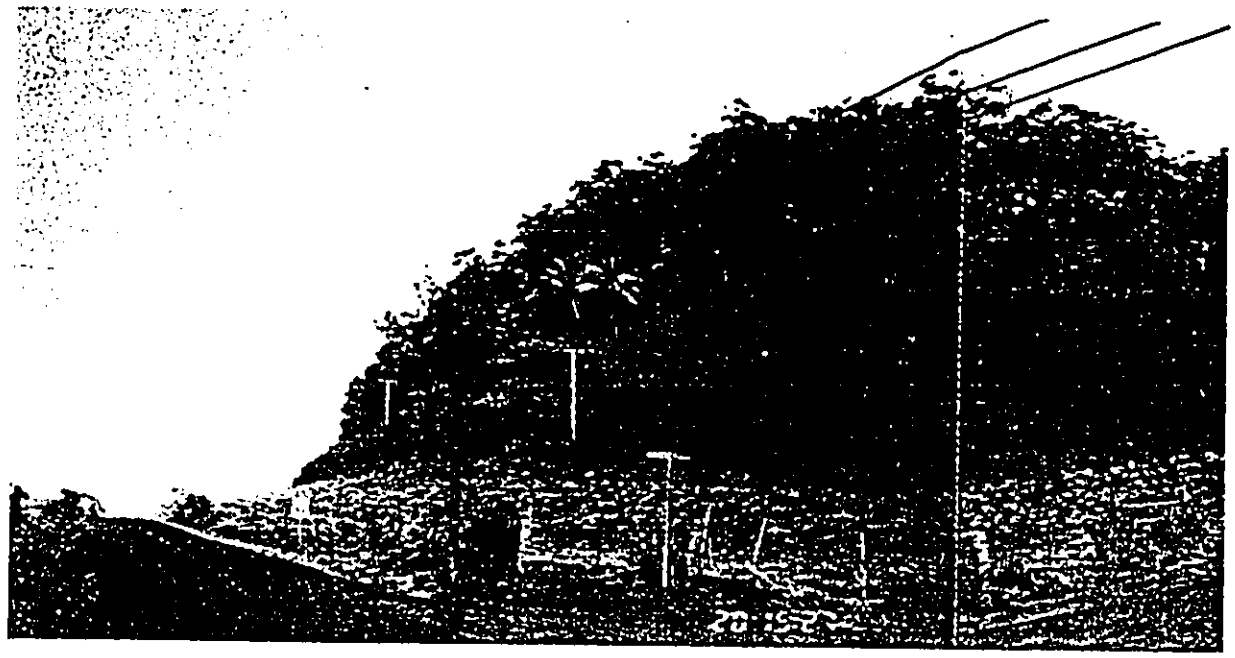
5 Chu, Michael,S. and Jones, Robert B., Coastal View Study, City and County of Honolulu Department Of Land Utilization, 1987.



COASTAL LAND FORM

COASTAL VIEW

PACIFIC PLANNING ENGINEERING, INC	Coastal Land Form and Coastal View	Figure 6.11.1

Mauka View

Located mauka of the project site forming a natural boarder are the cinder cones of Puu Kolo and Pahuolona. This unique land form characterized by its dual hill formation was determined to create a distinctive Mauka View from the highway. As shown in Figure 6.11.2, the view of these cinder cones from Hana Highway stands out in relation to Haleakala in the background. These cones were determined to have high visual qualities in relation to the design principles due to its contrasting appearance with Haleakala adding variety and emphasis to the view.

Important Open Spaces

As shown in Figure 6.11.2, the project site and surrounding area consists of undeveloped ranch land used for cattle grazing which has the common rural characteristics associated with most undeveloped land in Hana. Based upon the County Planning Department's experience, this undeveloped pasture land was determined to be a noteworthy Important Open Space resource. The project area was determined to have primarily high visual qualities resulting from the strong open space emphasis and unity.

Sites of Natural Beauty

Other than the two cinder cones Puu Kolo Pahuolona and Ka Iwi o Pele, there were no other resources in the immediate vicinity of the project site considered to be Sites of Natural Beauty. As a result, the analysis of these land forms will be discussed under the previous resource classifications.

PACIFIC PLANNING & ENGINEERING, INC	MAUKA VIEW	Figure 6.11.2

6.11.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, there would be no changes to the existing project site and surrounding pasture lands and the existing views would retain their visual qualities.

Proposed Project

The probable visual impacts from the project were assessed based upon the degree of change to the existing visual characteristics of identified resources in terms of the seven design principles. The results of the visual assessment using design principles identified in the Scenic Study are provided in Table 6.11.1.

A portion of the clubhouse will be visible along a short segment of Hana Highway near Haneoo Road. However, the proposed site for the clubhouse coupled with the sloping and hilly terrain of the project site provide a natural visual buffer for most of the clubhouse facility from the highway. As a result, the clubhouse should not change the existing visual qualities associated with the Mauka View. In comparison, there are many large multi-story residential estates in Hana which are clearly visible from the highway.

The construction of the clubhouse will also create new views of Puu Ka Iwi o Pele and the coastline from its proposed location for residents and visitors which are currently not available. Consequently, these added views should enhance the attractiveness and appreciation of the Coastal Land Forms and Coastal Views previously identified.

Table 6.11.1. Visual Resource Classification Analysis

	Existing Conditions	With Project
Coastal Land Form: Puu Ka Iwi o Pele		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	High	High
Balance	High	High
Directional Forces	Moderate	Moderate
Emphasis & Subordination	High	High
Contrast	High	High
Coastal View: Hana Coastline		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	High	High
Balance	High	High
Directional Forces	High	High
Emphasis & Subordination	High	High
Contrast	High	High
Mauka View: Puu Kolo & Pahuolona		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	High	High
Balance	High	High
Directional Forces	Moderate	Moderate
Emphasis & Subordination	High	High
Contrast	High	High
Important Open Space: Hana Ranch Pasture Land		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	High	High
Balance	High	High
Directional Forces	High	High
Emphasis & Subordination	High	High
Contrast	Moderate	High

Source: Pacific Planning & Engineering, Inc.

Assessing visual changes resulting from the conversion of existing open space pasture land to landscaped terrains associated with golf courses is subjective in nature. Some individuals may view pasture land as more visually appealing than landscaped terrain, and other individuals may view landscaped terrain and parks as being more aesthetically appealing.

The Scenic Study identified several golf courses as Noteworthy Open Space Views which included the Maui Country Club Golf Course and the Kaanapali Golf Course. Consequently, by incorporating the results of this Scenic Study, the project should not lower the existing visual qualities associated with the open space pasture land. The high visual qualities associated with this Open Space View should remain. The physical nature of a golf course is also a more compatible land use with the existing surroundings compared to an industrial site or commercial complex. Moreover, landscaping plans for the project will incorporate trees and flora compatible with the surrounding area to preserve the visual harmony in the area.

SECTION 7.0
SOCIO-ECONOMIC FACTORS

Earthplan prepared a Social Impact Assessment (SIA) report dated January, 1991, for the project's Environmental Assessment. This report has been updated to include current demographic and housing information, an analysis of probable impacts on Hana's Hawaiian culture and lifestyle, and results of negotiations with the Hana Community. Their updated report dated May, 1992, is summarized below in Section 7.1 through 7.4 and included in its entirety in Appendix L.

PKF's market feasibility and economic impact report is also summarized below in Sections 7.5 and 7.6 and included in its entirety in Appendix B.

7.1 RESIDENTIAL POPULATION

7.1.1 EXISTING CONDITIONS

From 1980 to 1990, Maui Island's population increased 42 percent to 91,400 persons, and Hana District's population increased 33 percent to 1,900 persons. Hana District and Hana Town have a higher percentage of Hawaiian residents than the County of Maui. In 1990, the percentage of Hawaiians in the County of Maui was 16 percent, while the percentage of Hawaiians in Hana District and Hana Town were 48 percent and 63 percent, respectively.

7.1.2 PROBABLE IMPACTS

No-Action Alternative

A regression analysis was conducted to forecast Hana's resident population in the year 1995 based upon historical trends. This regression model reflects a growth trend of approximately 2 percent which would meet the 2,300 projected population in the year 2000 described in the Hana Community Plan. Using this model, Hana's 1995 resident population is forecast to be approximately 2,040 residents.

Proposed Project

Hana is isolated and its unemployment rate for the second quarter of 1992 of 1.7 percent indicates almost no available labor force. The project may increase the population in Hana due to the in-migration of new full-time employees. The project will require an estimated 36 full-time employees. Hana residents who fill these jobs will likely leave a vacancy elsewhere in Hana. The upper limit of the project's indirect population impact would be the in-migration of up to 36 households, which represents an estimated 112 persons. The potential in-migration would be less to the extent that existing Hana residents working outside of Hana choose to return to work in Hana.

The project may indirectly increase the Hana District's population by up to six percent. In terms of sheer numbers, this increase is not expected to cause a significant impact because it is within the population projection of 2,300 established by the Hana Community Plan.

No short-term population increase will occur during the construction phase because Keola plans to fly construction workers to and from Hana on a daily basis.

7.2 HOUSING

7.2.1 EXISTING CONDITIONS

It is estimated that in 1990, Hana District contained 763 housing units and Hana Town had 217 housing units. The number of crowded units in Hana District and Hana Town were 16 percent and 18 percent, respectively, which were significantly greater than the County of Maui's rate of 8 percent.

In 1991, Keola commissioned a study on the housing needs in Hana. The study estimated that 188 new housing units would be needed to accommodate those persons who wished or needed to move to another unit.

Housing Development

Government housing agencies have been cooperative and helpful in the past. The recent appropriations totaling $1,000,000 by the State and County are evidence of this support for housing in Hana.

Since the completion of Keola's 1991 housing study, the committee which guided the preparation of the study became the Hana Affordable Housing and Community Development Corporation (HAHCDC). Current efforts include:

- Single Family Housing - The HAHCDC is currently working on a 67-unit residential subdivision near the Hana Medical Center. The Corporation is trying to maximize the number of houses constructed under a mutual self-help housing program, and has: 1) filed appropriate applications to the Farmers Home Administration in the U.S. Department of Agriculture; 2) requested a grant request for $10,000; and 3) is working with the Rural Community Assistance Corporation which will provide technical assistance. If this project is successful, it will be the largest self-help housing program implemented in Hawaii. A preliminary subdivision plan has been prepared, and $350,000 was recently received from the State Legislature. Also, $650,000 of Community Development Block Grant monies are available.
- Elderly Housing - The HAHCDC is also working with the Hana Medical Center Advisory Committee to designate 2.5 acres of the the Center's expansion land for an elderly housing project with a maximum of 25 units. The project is in the planning stage.
- Multi-Family Rental Housing - HAHCDC wants to develop approximately 40 rental units at Niumalu, on 18 acres around the park. This project would be implemented with government assistance.

In addition to developing housing units, HAHCDC is working with Hale Mahaolu, a Kahului-based non-profit organization, to create a program to help prepare prospective buyers in their purchase of homes in the subdivision. The Hawaii Housing Authority purchased 6.8 acres in Kaeleku for low income rental units, however, the project is in litigation.

7.2.2 PROBABLE IMPACTS

No-Action Alternative

Based upon the forecast increase in resident population under the No-Action Alternative, an additional 47 housing units would be needed. It is expected that many of these units would be constructed by individual property owners migrating to Hana. However, if additional housing units are not provided in the future, the projected increase in residential population may be lower or result in increased crowding or larger households.

Proposed Project

The project may result in an increase in population and a corresponding need for up to 36 additional housing units. If this occurs, it would exacerbate the current housing shortage. Rentals, in particular would be needed to accommodate the persons moving to Hana to work at the golf course or to fill a job vacated by a Hana resident working at the golf course.

Keola has provided assistance to the HAHCDC in the form of start-up, training, orientation, studies, surveys, workshops, legal and consultant fees, travel, inspection tours, clerical support, technical resources and funding. They have previously committed a donation of 15 acres of land for a single-family affordable housing project.

In addition to the above assistance to the HAHCDC, Keola will provide further direct support (i.e., land, funding, or in-kind services) to mitigate the housing needs of the project. However, the HAHCDC is a free standing entity, separate from and independent of Keola. To the extent that Keola resources, financial, staffing or otherwise are accepted, the HAHCDC will retain its independent status.

It should be noted, that a significant number of Hana residents that currently work outside of Hana have expressed a strong desire to work at the golf course in Hana which would reduce the housing needs of the project. No housing will be needed for construction workers because they will be flown to and from Hana on a daily basis.

7.3 HANA COMMUNITY

7.3.1 EXISTING CONDITIONS

Hana's uniqueness has been extolled by residents and visitors alike. Residents believe that Hana is an exceptional place to live, work and raise children. They described a lifestyle typical of a small town, social qualities based in the Hawaiian culture and an environment which surrounds and nurtures the community. While these three characteristics can be found in other parts of Hawaii, Hana's strength lies in the harmonious existence of all three. Thus far, even though Hana has undergone many changes including major population fluctuations, residents feel that a desirable balance still exists.

Many fear, however, that Hana's "specialness" is fragile; they believe that a significant alteration of any one component would alter the total spirit or essence of Hana. There is strong consensus, as shown both in the community's survey and in interviews conducted for the SIA, that changes occurring in Hana should be in the context of slow growth which is well-planned with input by the community.

7.3.2 PROBABLE IMPACTS

Lifestyle Implications

The lifestyle implications to the Hana Community assesses the continued presence of Keola, potential for further urbanization, change in the pace of activities, and increases in recreational choices.

Continued Presence of Keola

The golf course is important to increasing the economic viability of the Hotel Hana-Maui and thus Keola. If the project can achieve the objectives of increasing hotel occupancy and providing capital through the sale of golf memberships, then the Hotel, Hana Ranch and Keola will be more financially viable and other more extreme alternatives such as the subdivision of company lands, will not be necessary. If these economic goals are realized, then the implications of continued presence of Keola and its current operations are as follows:

- Most of Hana's economic base, which is tied either directly or indirectly to Keola, will remain relatively stable.
- With the Hotel employing about a fourth of Hana's available labor force, employment security will continue for many Hana residents.
- The project will help keep community planning at a manageable level. The community will be able to continue to work with one major landowner, rather than many different landowners. This will facilitate a manageable and focussed working relationship between the community and the developer.

These implications are generally positive. The Hana Negotiations Committee has indicated that the Hana Community wants Keola to be economically viable because it means stable employment for many Hana residents.

The other side of continuing the company and its operations is that one entity will retain a major role in determining Hana's economy. Changes to the economy by other entities will be limited and difficult because of differences in scale. In the 1991 SIA, economic dominance was viewed both positively and negatively. People want Keola to be successful because it means economic stability for Hana. They also want economic diversification so that Hana residents can have more job and business alternatives. Given the slow, planned growth desired by those interviewed, it is believed that the continuation of Keola's operations would be compatible with the desires of the Hana community. If the project is successful, it would contribute to this compatibility, but would not promote economic diversification except for new golf course jobs.

Potential For Further Urbanization

The project's potential for further urbanization was the most frequently and strongly expressed concern in the 1991 SIA, and is a major issue identified by the Hana Negotiations Committee.

Golf courses can be considered indicators of development interest. For rural areas such as Hana, a golf course is often a "red flag" indicating that there may be subsequent real estate interest in the area. To many interviewed in the 1991 SIA, the proposed golf course was synonymous with undesired urban development, specifically hotel expansion and expensive housing for outsiders. People also were concerned that property values will increase, and affected property owners will want to develop or sell the nearby land to offset the increased taxes.

Presently, luxury homes are common in Hana and continue to be built. The project, however, does not include these more intense forms of development including the sale of luxury homes or condominiums around the golf course nor expansion of the Hotel Hana-Maui. Keola's long-term plans include improvements to the Hana Town Center and Hotel housekeeping and employee facilities, however, the improvements would be limited to existing designated areas and are not related to this project.

The Office of State Planning's Golf Course Development in Hawaii: Impacts and Policy Recommendations reported that previous studies have found that Hawaii's golf courses have very limited impacts on nearby property values. The report states, "In both the short- and long- term time frame, however, golf courses have been found to have minimal impact on property values." Since Keola owns the entire project site and most of the land around the project site, they will be the landowner most affected by any increase in property taxes.

The project by itself is not a precedence for further urbanization within lands owned by the company. Other landowners, however, may view the golf course as an opportunity for developing their own properties, in which case the golf course could lead to further development. Development opportunities for other landowners exist without the golf course as seen in the proposed Hina-Malailena village marketplace project.

Pace of Activities

If the project is successful it will probably not change the tranquil and secure aspects of Hana's lifestyle. The current pace of life is expected to continue for the following reasons:

- The golf course and its support facilities will be contained on one site and no off-site facilities will be needed. Thus, Hana's town landscape will remain the same and no new urban-type facility will be introduced outside of the project site.
- No new hotel rooms will be added. Rather, the golf course would improve what is already existing. Hence, the multiplier effect typical of new hotel rooms, in terms of new jobs and housing, would not occur.
- The golf course will not bring in a significant number of people.

Increase In Recreational Choices

Hana residents currently enjoy active sports and ocean recreation activities including food-gathering, surfing, swimming, etc. The project will increase resident choices in recreational activities by adding golf as a leisure time activity. During the 1991 SIA, various ethnic groups appreciated the new activity either because they were already golfers or were interested in learning the sport. In the 1992 study, Hana Hawaiian adults also felt the golf course would be an additional recreational opportunity for Hana.

An important consideration in successfully integrating the golf course into Hana's recreation base is resident accessibility. For Hana residents to accept this facility as part of its recreational resources, they need to feel that they have physical, financial and psychological access. To assist in the integration of the golf course into Hana's recreation base, Keola intends to offer "Kamaaina" rates for Hawaii residents although green fees have not been formulated for the different proposed users at this time. In addition, the clubhouse will be open to the resident community of which Keola expects considerable use for dining activities. The clubhouse's meeting rooms will also be made available for the community's use.

Social Interactions

Changes in Overnight Visitors

The resort has traditionally been oriented to the luxury market, with emphasis on those seeking rest and relaxation. The project may change the hotel guest profile in the following aspects:

- An increased number of younger, first-time guests.
- In light of the international corporate memberships, an increase in Japanese visitors.

The change in type of overnight visitor may affect the social interaction between residents and visitors. Younger, first-time guests may not appreciate Hana's slow pace of life and may expect quicker responses to their requests. Foreign visitors provide opportunities for cultural exchanges as well as barriers. Though other ethnic values have been assimilated over time, the prevailing culture in Hana is based on Hawaiian values and practices. The ability of these other cultures to understand, appreciate and accept Hawaiian values is important to continuing the harmony between residents and visitors that has existed for many years.

It is likely that the social impact of having more foreign visitors will be similar to that of interacting with people of different social and economic backgrounds, regardless of the origin of the visitors. The present culture of Hana is already one which represents assimilation. Throughout Hana's modern history, different cultures have constantly blended into the prevailing culture, which is based on Hawaiian values and practices. People of Chinese, Filipino and Japanese ancestry have worked with Hana residents on the plantations, and many have made Hana their home, The 1990 census indicates that the proportion of Caucasians has increased significantly during the 1980's which has further impacted the culture. Thus, in spite of the introduction of different cultures, Hana is still predominantly Hawaiian in its culture, its attitude and in daily practices.

Consequently, golf course members are expected to have a limited effect on residents. Non-local visitors have been staying at the Hotel for more than 45 years. The over 500,000 annual day visitors to the Hana region will clearly have a greater impact than the additional 11,000 annual Hotel guests (including golf course members) with the project. Furthermore, golf course members are expected to visit Hana infrequently, staying at the Hotel only once or twice a year.

Potential For Exclusivity

Currently, people of upper income levels live in Hana on a full- or part-time basis and are guests at the hotel, so there is already interaction between people of different income levels. The more affluent residents participate in community organizations and in social functions, and no conflicts based on economic disparity were reported.

The golf course and clubhouse facilities will be made available to Hana residents which will help mitigate social conflicts regarding economic disparity and exclusivity.

Rural Environment

The project would alter the existing rural environment by introducing a frequently-maintained and well-manicured open space land area as discussed in Section 6.11. This change to the rural environment was viewed in two different ways by those interviewed during the 1991 SIA.

- In one perspective, the golf course would be an attractive, alternative use of open space. It will serve as a foreground for the mountains and complement the ocean. The clubhouse may also be considered environmentally complementary if sensitively designed.
- Others viewed the golf course as being different from the existing rural landscape of pasture lands and undisturbed natural environment. The placement of trees, waterways and support facilities would be deliberate. The golf course would "urbanize" what is now a natural and agricultural environment. For those who strongly prefer the country atmosphere, the golf course would be an unwelcome introduction of urbanization.

The latter perspective is related to the concern of further urbanization due to golf course development. For Hana residents to not view the golf course as a symbol of urbanization, there will need to be clear measures prohibiting undesirable urban development, such as luxury housing units around the golf course.

7.4 HANA'S HAWAIIAN COMMUNITY

A recurring theme expressed in the interviews during the 1991 SIA was the strong presence of "Hawaiian" in Hana. The project's impact on Hana Hawaiians were assessed in two ways:

1. Previous works on Hawaiian culture - A literature review of Hawaiian culture was conducted in response to concerns about how the project would impact the Hawaiian culture in Hana.
2. Project effects on Hawaiians in Hana - Fieldwork was conducted to better understand the lifestyles of Hana Hawaiians and to identify project-related issues specific to Hana Hawaiians.

Centuries of various ethnic groups coming to Hawaii has created a cultural pluralism. Today there is "local" culture - a combination of the various ethnic groups' distinct cultural habits. Various behaviors, language, foods, music, and so on, have become common to the local culture. The process of colonization, by its nature, has a diminishing effect on the indigenous culture and Hawaii is no exception. The most important aspect of culture and cultural transmission is the language and religion. Today, though relatively few families speak Hawaiian in the home or practice the spirituality of their ancestors, there are strong efforts within the community to revive and reconstruct these aspects of Hawaiian culture.

7.4.1 HAWAIIAN COMMUNITY CONCERNS

7.4.1.1 Previous Works on Hawaiian Culture

In a 1959 study entitled Acculturation of Hawaiians on the Island of Maui, Hawaii, Forster presented an ethnographic account of contemporary Hawaiians to determine the degree of loss of traditional Hawaiian culture. Forster identified traditional Hawaiian customs such as speaking the language, the use of kahuna and using traditional medicines. He concluded that the interchange between the various cultures over the years made it difficult to isolate purely Hawaiian practices. For example, the growing of taro in Keanae did not use a Hawaiian technique but Chinese, and a "Hawaiian" medicinal remedy was a combination of Japanese, Chinese and Hawaiian folk medicine. He concluded that acculturation had progressed to the point where it was difficult to isolate distinct cultural characteristics.

Jocelyn Linnekin wrote a number of articles and books after completing field work in the Hana communities of Keanae and Puuiki. In Children of the Land: Exchange and Status in a Hawaiian Community (1985), she found that the Keanae Hawaiians can distinguish themselves from non-Hawaiians because they are living a model of the past. She expects that, because of current efforts to assert Hawaiian culture and values throughout Hawaii, Keanae will survive and remain distinctively Hawaiian.

She asserts that modern Hawaiian society illustrates both persistence and change. She found that the most salient examples of Hawaiian cultural persistence are the luau, exchange-in-kind (versus selling and buying), and the centrality of women. These were not just important in the prior value system, but meaningful in the modern social and political context. She also noted that Hawaiians are perhaps the most acculturated people in Polynesia. Hawaiian culture itself placed a high value on innovations from outside, thus having the potential for transformation.

Status of Definition of Hawaiian Culture

Contemporary Hawaiian culture is moving into the twenty first century with no agreed upon definition. The foregoing research "affirm" values and "advocate" behaviors, but do not identify or explain what makes these values and behaviors a culture. How to define Hawaiian culture is a topic of debate between many native Hawaiians both within and outside academia.

7.4.1.2 Perceived Impacts on Hana's Hawaiian Community

Since there was no agreed upon definition of Hawaiian culture, the following was studied: 1) how the project might affect the Hana Hawaiian lifestyle through an understanding of daily activity patterns and social interactions, and 2) reactions to the project of Hawaiians in Hana. This information was to be identified by the local Hawaiian population; hence, the standard for analytical interpretation was the reference group. In March 1992, data was collected from three groups; kupuna (seniors), youth and working-age adults. The groups were comprised of mostly Hawaiian individuals who met the aforementioned age and residence criteria.

Lifestyle

The youth feared that the golf course may kill the pigs, trees and fauna from which they make Hawaiian instruments. The adults pointed out that the golf course would limit their access to the area for hunting and gathering. They said it would reduce the pasture land for ranching and saw pollution from the run-off killing the fish, seaweed and ultimately, their use of the ocean. The seniors felt the golf course would not affect their daily activities.

Hawaiian vs. Local Characteristics

The adults and the youth were asked to discuss what it means to be "Hawaiian," and how does Hawaiian relate to "local." Initially, the youth did not see a difference and asserted that "Local is Hawaiian," "Local is being born and raised in Hawaii."

Whereas the youth tended to see Hawaiian and local as synonymous, the adults felt that Hawaiian is the very foundation of Hana's lifestyle. To be Hawaiian is to live and work the land, although one person pointed out that it is becoming increasingly difficult to live with the land in the traditional Hawaiian way.

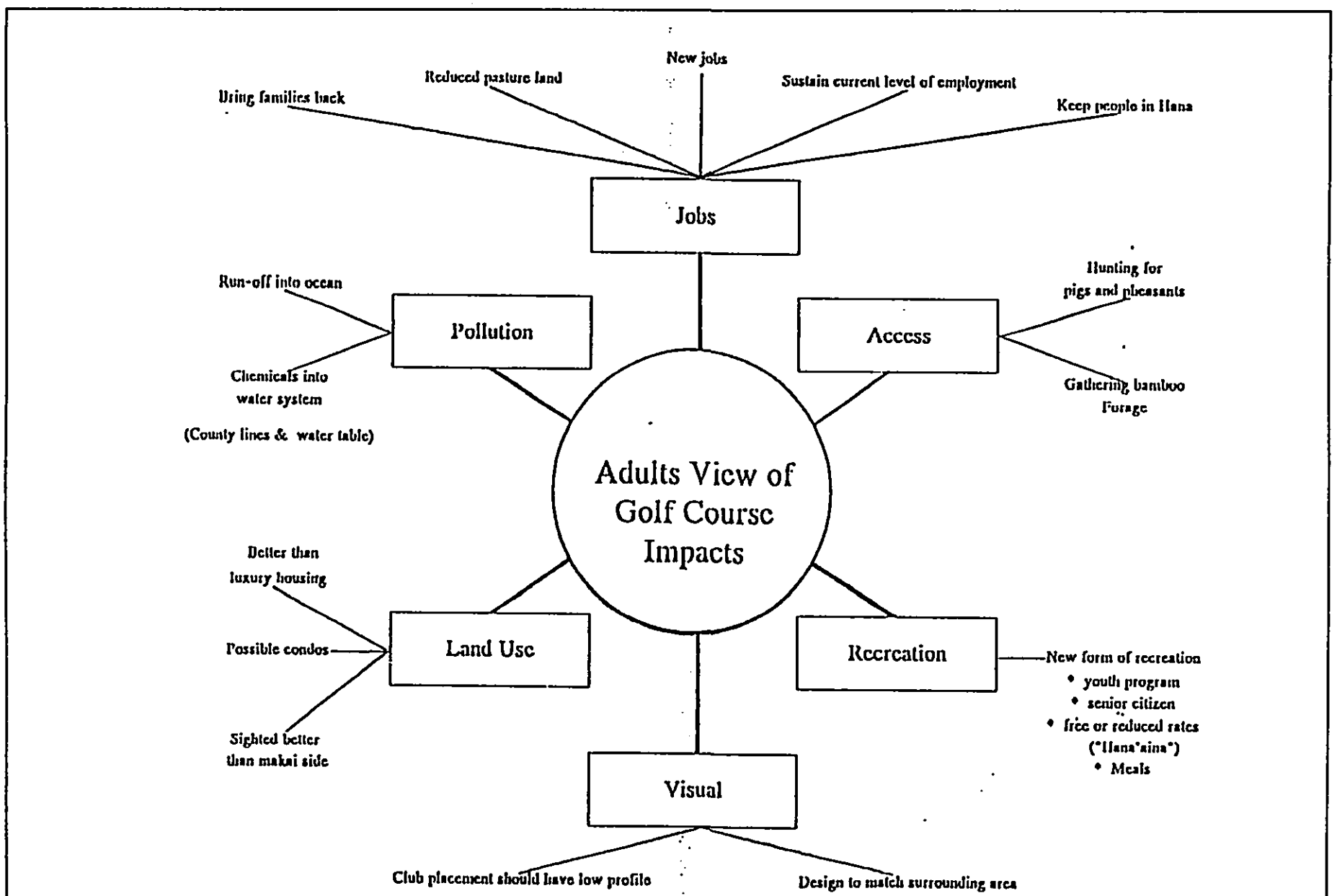
One person noted that, when he was growing up, there was no such thing as "local." You were either Hawaiian, Japanese, and so on. "Local," he felt, is a relatively recent term. They said "local" takes a little from each culture, but stressed that, in Hana, the basic foundation of local culture is Hawaiian.

Project-Related Concerns

When asked about possible impacts of the golf course, the kupuna, adults and youth groups exhibited different tolerance levels of change. They had very different "bottom lines" when regarding change resulting from the golf course as described below. Figures 7.4.1 and 7.4.2 graphically illustrate the adults' and youths' view of golf course impacts, respectively.

The kupuna's reactions to the golf course are as follows:

- No effect on their daily lifestyle - They believed that the golf course would not affect their daily activities or their social patterns.
- Jobs was major benefit - For the most part, they encouraged the project because they believed the golf course would bring jobs and help the Hotel stay in business.

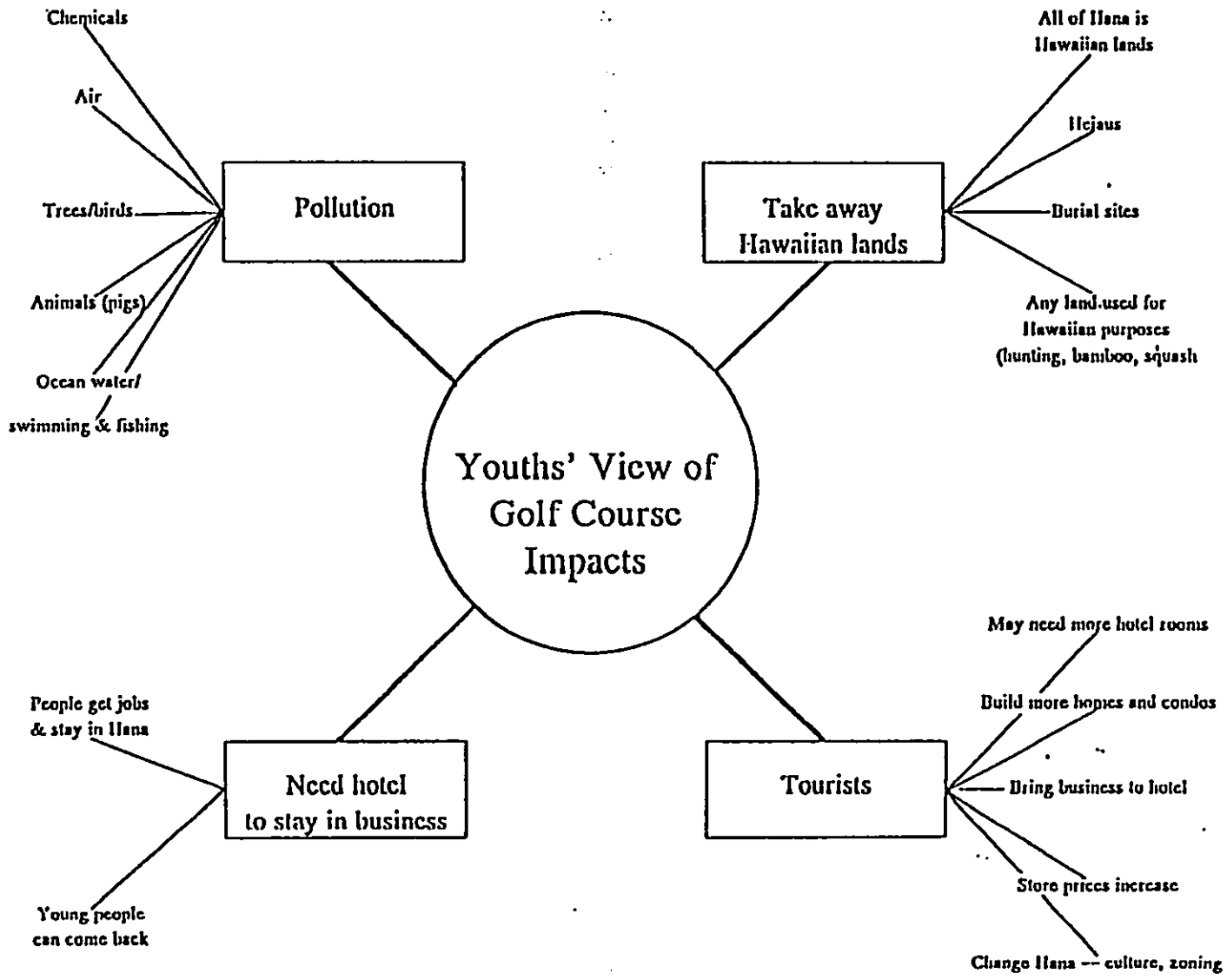


PACIFIC PLANNING & ENGINEERING, INC

Source: Earthplan

Adults' View of Golf Course Impacts

Figure 7.4.1



PACIFIC PLANNING & ENGINEERING, INC

Source: Earthplan

Youths' View of Golf Course Impacts

Figure 7.4.2

Perceived project impacts cited by the adult group included the following:

- Jobs - Jobs was the most frequently-mentioned impact generated by the proposed golf course. The bottom line is that they wanted to stay in Hana. To remain in Hana, they have to make a living. If the golf course meant that they can keep their jobs, they wanted to see the project implemented.
- Land use and visual impacts - Although they felt the golf course would be more tolerable than luxury housing, they are fearful that condominiums would be built in the future. Much discussion took place about the siting of the golf course; they felt that the current siting was better than having a golf course on the makai side of the road.
- Access - People use the golf course site as part of and access to hunting areas. They were concerned that the golf course would discontinue these activities.
- Pollution - They were concerned that the chemicals from the golf course would pollute the ocean, thereby harming fishing grounds in the area. Chemicals were also seen as a source of pollution to the water system.
- Recreation - The adults saw the golf course as a new form of recreation for Hana.

For the youth, the major impacts perceived by the golf course are as follows:

- Take away Hawaiian lands - They felt a strong sense of cultural impact. They were afraid that the project would destroy heiaus, and felt that eventually they would lose the Hawaiian culture. They felt the project would take away Hawaiian lands, i.e. they see all of Hana as Hawaiian lands. They said when development takes away land that was previously used for Hawaiian things, such as hunting and gathering, that is taking away Hawaiian lands.
- Tourists - For the most part, they did not like tourists. They thought some of those visitors (like others before them) would like Hana and want to stay resulting in more homes and people in the area. They also talked about the changes that might occur in Hana with more tourists. These changes included more condominiums and an increase in store prices. All of these potential happenings would alter their culture.

- Pollution - They expressed strong concern about golf course chemicals and possible pollution. They were afraid that chemicals would harm the ocean, as well as the animals in the area. They felt that air pollution would be a problem, and that the chemicals would impact trees and birds.
- Need hotel to stay in business - Some said their parents' jobs were being affected by low hotel occupancy. They acknowledged that the golf course might help people keep their jobs and stay in Hana, and that other young people may be able to return to Hana if there were more jobs.

7.4.2 PROBABLE IMPACTS ON HANA'S HAWAIIAN COMMUNITY

Overall, the project is expected to have minimal impact to Hana's Hawaiian Community. The assessment and analysis results indicate that the project will not impact the Hawaiian Community in the manner or degree expressed in their concerns obtained during the focus group sessions.

In regard to lifestyle concerns expressed by the youths, the project will not kill pigs, trees, and fauna used for Hawaiian instruments since the site will be located on existing pasture land.

Based upon the assessment conducted on recreational facilities (Section 8.10), the project will eliminate one trail presently used for hunting activities. However, Keola intends to replace this trail with another after completion of the project to continue access to hunting grounds by authorized residents. Consequently, the project will have a minimal impact on access to hunting grounds which was a concern expressed by the adults.

The adult's concern with potential impacts on the ocean and fishing grounds in the area along with the water system were studied and are discussed in various sections of the Final EIS and the Appendix. Based upon these studies, the project is expected to have minimal to no impact on fishing grounds, ocean resources, and water system.

Both the adults and kupuna expressed a strong desire to stay in Hana and to have the young people be able to live in Hana. Living in Hana meant keeping the ohana together, thereby preserving the most basic social resource in Hana.

Living in Hana also means having to work or find some means of economic survival. The adults and kupuna believed that the project meant business for the Hotel and it meant more jobs at the Hotel and the golf course. The project would help them maintain their bottom line; it would help them and their children stay in Hana.

The youth were strong advocates of Hawaiian rights. They felt anything that threatened Hawaiian lands and culture was negative. Tourists were seen as being intrusive and the taking of Hawaiian land was the worst thing the golf course would do. The Hana youth did not cite jobs as a positive benefit nor did they express a strong desire to stay in Hana. In fact, they often looked forward to typical summer trips outside of Hana. This does not imply, however, they do not value living in Hana, but simply indicates that these jobs and a future in Hana are not priorities at this point in their lives.

7.4.3 POTENTIAL MITIGATION MEASURES

Social compatibility between the project and the Hana community is important to retain the balance and harmony of the community's lifestyle, social qualities and rural and natural environment.

At the core of achieving project compatibility is the Hana community's ability and willingness to accept and/or adjust to the project. For some people, the price of acceptance/adjustment is too high, regardless of the potential economic benefits of the project. Others may feel that, if they want to continue to work and live in Hana, they must accept/adjust to the project. For this latter group, it is very important that the conditions of acceptance are community-based, that they have a say in the types of changes the project will bring and how the project can work for them. As the Hana Negotiations Committee stated *"let Hana's people, with Hana's sensitivities, solve Hana's problems with Hana-type solutions."*

Keola intends to continue working with the Hana community to develop community-based programs and actions. The Hana Negotiations Committee indicates that it feels a partnership has developed between the Hana community and Keola. It is expected that this partnership will continue to evolve and may address the following types of issues: long-range planning for the Hana community; defining the Hana lifestyle; community access and use of the proposed golf course.

Keola has made an internal management decision to assist the Hana community in various efforts. Assistance in developing a new fire station, for example, is not a partnership-type decision, but an internal commitment on the part of Keola to assist the community. Keola is committed to working with the community on other community concerns to determine what assistance it could provide.

Keola plans to develop educational programs for its guests to inform them on Hana's cultures and lifestyles, and similarly, educational programs for its Hotel employees and Hana residents to inform them on the various cultures and lifestyles that are expected to be attracted by the project.

7.5 GOLF COURSE AND HOTEL OPERATIONS

PKF performed a market feasibility and economic impact study of the proposed golf course and its effects on the performance of the Hotel Hana-Maui. Their report is summarized below and included in its entirety in Appendix B.

7.5.1 GOLF COURSE MARKET ANALYSIS

The interest in golf has increased steadily over the years in Hawaii and on the U.S. Mainland. Golf's popularity in Hawaii has been further enhanced by its beautiful golf courses and Hawaii's moderate climate that allows excellent year round playing conditions. In addition, Hawaii has been promoted nationally and internationally as a "golfer's paradise" by the travel industry and by television broadcasts of professional golf tournaments played in Hawaii. Golf has, therefore, become a major Hawaiian tourist activity and attraction, especially for U.S. Mainland and Japanese visitors. The combined tourist and resident demand for golf in Hawaii has substantially exceeded available supply.

7.5.1.1 Comparative Analysis Of Resort Golf In Hawaii

A total of nine, three primary and six secondary, existing comparable resort golf courses to the proposed Hana Ranch Country Club were identified by PKF. Resort golf courses, for purposes of this study, were defined as those that are specifically associated with a resort hotel or are in close proximity to the resort. The primary comparable supply was determined based on two criteria:

1. A resort golf course associated with a single hotel.
2. An isolated resort destination.

Based on these criteria, Kaluakoi on Molokai, Koele on Lanai, and Sea Mountain on the Big Island of Hawaii golf courses, which have played a significant role in attracting guests to its respective resorts, were considered primary comparables. Because these are isolated golf resorts with a single hotel, these golf courses have not been optimally utilized. In 1990, these isolated facilities averaged only 23,800 rounds of golf for the year compared to the other more developed and less isolated resorts which averaged 40,400 rounds.

Discussions with managers of these isolated resorts has clearly indicated that their hotel facilities would be substantially hurt if their golf facilities were eliminated. Presently, these isolated resorts estimate that up to 25 percent of their guests utilize their golf facilities and comprise as much as 92 percent of total golf course play.

7.5.1.2 Estimated Annual Rounds Of Golf

The estimated annual rounds for the Hana Ranch Country Club were based upon PKF's survey results of comparable existing resort golf courses in Hawaii.

Market Mix of Play

Patronage by hotel guests ranged from a high of 92 percent to a low of 13 percent of total rounds played. Hotel guest patronage was highest for primary comparable courses and declined for courses that are less isolated, more readily accessible and located in close proximity to resident population bases. Accordingly, the proposed golf course, due to its secluded location, limited accessibility and small surrounding community, will be very dependent on hotel guest patronage. The following market mix of play was projected:

Market Mix	Percent
Hotel guests	90
Off-resort visitors	5
Hawaii residents	5
Total	100

Hotel Guest Patronage

The percentage of hotel guests that played golf (i.e., hotel guest patronage of the golf course) ranged from a high of 50 percent to a low of 20 percent, with an average of 28 percent. For the Hana Ranch Country Club, PKF estimated the hotel guest patronage to be above average at 40 percent due to its isolated location.

Annual Hotel Guest Golf Rounds

Since the golf course will be very dependent upon the patronage of hotel guests, the rounds of golf played are directly related to hotel occupancy. Based on the projected hotel occupancy of 75 percent, the annual hotel guest golf rounds was computed as follows:

Available hotel rooms	97
Days in a year	x 365
Potential annual room nights	35,405
Estimated room occupancy (percent)	x .75
Estimated annual room nights	26,554
Double occupancy factor	x 2
Estimated annual hotel guests	53,108
Estimated guest patronage of golf course (percent)	x .40
Annual hotel guest golf rounds	21,243

Total Annual Golf Rounds

Based on the above market mix of play and the annual hotel guest golf rounds, the total annual golf rounds by various market segments was estimated as follows:

Market Segment	Percent	Rounds
Hotel guests	90	21,243
Off-resort visitors	5	1,180
Hawaii residents	5	1,180
Total annual golf rounds	100	23,603

7.5.2 GOLF COURSE OPERATIONS

7.5.2.1 Golf Memberships

The major shareholder of Keola, the Kato Group, has owned and operated four very successful golf courses in Japan since 1978. Their golf course members have generally not been affected by current economic conditions in Japan and other locations. The Kato Group recently conducted a survey of their 10,000 golf members and more than 1,000 members indicated they were interested in purchasing Hana golf memberships. Consequently, Keola predicts that it will be able to sell 1,000 corporate memberships at a sales price of $200,000 each, to existing members of the Kato Group's golf courses within a one year period. The total membership fees would amount to $200,000,000.

It is anticipated that there will be no individual memberships, and 1,000 will be the maximum number of corporate members. The membership fee would be comprised of a 20 percent non-refundable initiation fee and a 80 percent non-interest bearing deposit, refundable after 10 years if the member wishes to terminate membership. Memberships will be transferable, and Keola believes that the 1,000 member level will be maintained regardless of terminations. It has been the experience of the Kato Group that memberships are rarely redeemed and need to be repaid. Keola believes it is unlikely for a large number of members to terminate, and even more unlikely for a sizable number of members to terminate at the same time. If repayment of the deposits should occur, Keola expects there would be an adequate demand to absorb resales of any terminated memberships.

When membership sales are initiated, the transactions will be handled and overseen by Japanese national banks and not stock exchanges. The coordination of membership sales will be managed by the Kato Group's own offices. Members will not have any ownership interests in Keola nor its land holdings in Hana. Currently, memberships comparable to Keola's plan are selling for approximately $200,000.

Members will not be assessed dues or green fees, but will be subject to all other charges. It is further anticipated that the number of members playing the golf course at any one time will be insignificant to the overall operation and, therefore, should not be a disruption of normal operations.

Assuming that 100 percent of the golf memberships are sold ($200,000,000), Keola would be able to fund the costs of golf course construction ($43,000,000), repay all of its existing debt ($132,000,000), and have $25,000,000 remaining to finance projected operating losses ($19,200,000 with the golf course).

7.5.2.2 Golf Course Financial Summary

The estimates of operating results for the proposed Hana Ranch Country Club for the ten year period 1994 to 2003 are presented in Table 7.5.1, and were based primarily on PKF's survey of comparable existing golf courses in Hawaii.

Based on an analysis of comparable golf resorts in Hawaii, the green and cart fees (1991 dollars) were estimated to be: hotel guests - $75; off-resort non-Hawaii residents - $120; and Hawaii residents - $55. The golf course's net operating income is projected to improve steadily from a loss of $334,000 in 1994 to a profit of $244,000 in 2003.

Employment

The golf course is expected to employ approximately 36 full-time employees for grounds maintenance, golf operations, food and beverage and administrative support. In addition, it is expected that Keola employees from other operations and Hana residents would be employed on a part-time basis.

The following is a preliminary list of the types of full-time positions that would be needed for the golf course:

Job Description	No. of Positions
Golf course maintenance	16
Golf course operations	7
Food and beverage	7
Administration and clubhouse support	6
Total	36

Keola estimates that at least 75 percent of the golf course employment needs can be recruited from Hana. Hana residents and previous Hana residents (kamaaina) who wish to return will be given job placement priority for full and and/or part-time employment.

Table 7.5.1
Statement of Estimated Annual Operating Results

HANA RANCH COUNTRY CLUB
HANA, MAUI, HAWAII
STATEMENT OF ESTIMATED ANNUAL OPERATING RESULTS

	1994		1995		1996		1997		1998		1999		2000		2001		2002		2003	
Revenue:																				
Green Fees	$1,667,000	62.9%	$1,838,000	62.9%	$2,052,000	62.9%	$2,283,000	62.9%	$2,552,000	62.9%	$2,859,000	62.9%	$2,797,000	62.9%	$2,937,000	62.9%	$3,078,000	62.9%	$3,232,000	62.9%
Food & Beverage	328,000	12.4%	361,000	12.4%	404,000	12.4%	449,000	12.4%	498,000	12.4%	523,000	12.4%	569,000	12.4%	577,000	12.4%	604,000	12.4%	636,000	12.4%
Pro Shop Sales	546,000	20.6%	607,000	20.6%	673,000	20.6%	749,000	20.6%	830,000	20.6%	872,000	20.6%	915,000	20.6%	961,000	20.6%	1,009,000	20.6%	1,060,000	20.6%
Other Income	109,000	4.1%	120,000	4.1%	135,000	4.1%	150,000	4.1%	166,000	4.1%	174,000	4.1%	183,000	4.1%	192,000	4.1%	202,000	4.1%	212,000	4.1%
Total Revenue	2,650,000	100.0%	2,921,000	100.0%	3,264,000	100.0%	3,631,000	100.0%	4,026,000	100.0%	4,228,000	100.0%	4,439,000	100.0%	4,662,000	100.0%	4,895,000	100.0%	5,140,000	100.0%
Departmental Expenses:																				
Golf Course Maintenance	1,104,000	66.2%	1,160,000	63.1%	1,218,000	59.4%	1,278,000	56.0%	1,342,000	53.0%	1,409,000	53.0%	1,480,000	53.0%	1,554,000	53.0%	1,632,000	53.0%	1,713,000	53.0%
Food & Beverage	328,000	100.0%	354,000	98.1%	388,000	96.0%	418,000	93.1%	448,000	90.0%	471,000	90.1%	496,000	90.0%	519,000	89.9%	545,000	89.9%	572,000	89.9%
Pro Shop	519,000	95.1%	556,000	92.0%	606,000	90.0%	652,000	87.0%	706,000	85.1%	741,000	85.0%	778,000	85.0%	817,000	85.0%	858,000	85.0%	901,000	85.0%
Total Departmental Expenses	1,951,000	73.6%	2,068,000	70.8%	2,212,000	67.8%	2,348,000	64.7%	2,496,000	62.0%	2,621,000	62.0%	2,752,000	62.0%	2,890,000	62.0%	3,035,000	62.0%	3,186,000	62.0%
Net Departmental Income	699,000	26.4%	853,000	29.2%	1,052,000	32.2%	1,283,000	35.3%	1,530,000	38.0%	1,607,000	38.0%	1,687,000	38.0%	1,772,000	38.0%	1,860,000	38.0%	1,954,000	38.0%
Unapportioned Expenses:																				
Administrative & General	667,000	25.2%	700,000	24.0%	735,000	22.5%	772,000	21.3%	810,000	20.1%	851,000	20.1%	894,000	20.1%	938,000	20.1%	985,000	20.1%	1,034,000	20.1%
Management Fee	80,000	3.0%	88,000	3.0%	98,000	3.0%	109,000	3.0%	121,000	3.0%	127,000	3.0%	133,000	3.0%	140,000	3.0%	147,000	3.0%	154,000	3.0%
Heat, Light and Power	133,000	5.0%	146,000	5.0%	163,000	5.0%	182,000	5.0%	201,000	5.0%	211,000	5.0%	222,000	5.0%	233,000	5.0%	245,000	5.0%	257,000	5.0%
Repair and Maintenance	11,000	0.4%	15,000	0.5%	18,000	0.6%	22,000	0.6%	28,000	0.7%	30,000	0.7%	31,000	0.7%	33,000	0.7%	34,000	0.7%	36,000	0.7%
Total Unapportioned Expenses	891,000	33.6%	949,000	32.5%	1,014,000	31.1%	1,085,000	29.9%	1,160,000	28.8%	1,219,000	28.8%	1,280,000	28.8%	1,344,000	28.8%	1,411,000	28.8%	1,481,000	28.8%
Income Before Fixed Charges	(192,000)	-7.2%	(96,000)	-3.3%	38,000	1.2%	198,000	5.5%	370,000	9.2%	388,000	9.2%	407,000	9.2%	428,000	9.2%	449,000	9.2%	473,000	9.2%
Fixed Charges																				
Real Property Tax	94,000	3.5%	98,000	3.4%	103,000	3.2%	109,000	3.0%	114,000	2.8%	120,000	2.8%	126,000	2.8%	132,000	2.8%	139,000	2.8%	145,000	2.8%
Insurance	48,000	1.8%	52,000	1.8%	56,000	1.7%	61,000	1.7%	66,000	1.6%	69,000	1.6%	73,000	1.6%	76,000	1.6%	80,000	1.6%	84,000	1.6%
Total Fixed Charges	142,000	5.4%	150,000	5.1%	159,000	4.9%	170,000	4.7%	180,000	4.5%	189,000	4.5%	199,000	4.5%	208,000	4.5%	219,000	4.5%	229,000	4.5%
Net Operating Income	($334,000)	-12.6%	($246,000)	-8.4%	($121,000)	-3.7%	$28,000	0.8%	$190,000	4.7%	$199,000	4.7%	$208,000	4.7%	$220,000	4.7%	$230,000	4.7%	$244,000	4.7%

Source: PKF Hawaii

7.5.3 COMBINED GOLF COURSE AND HOTEL OPERATIONS

7.5.3.1 Hotel Hana-Maui With The Golf Course

In 1991, the primary luxury market experienced an average occupancy rate of 62 percent (with a range between 35 and 83 percent), while the Hotel Hana-Maui achieved only a 46 percent occupancy rate.

The addition of a golf course will help the Hotel offer a significantly more competitive product which will generate new room night demand. Because of the Hotel's relative seclusion and lower number of available rooms compared to competitive hotels, PKF concluded that a 75 percent stabilized occupancy is appropriate for the Hotel as a golf resort. Although several luxury hotels that possess their own golf courses perform at higher occupancies, those properties have a comparatively higher number of available rooms or are in a resort destination that offers multiple hotel facilities, and consequently they enjoy the advantage of a greater critical mass of visitor accommodations and recreation facilities.

With a projected stabilized occupancy of 75 percent and an anticipated market mix of 98 percent free and independent travelers and two percent group business, the Hotel is expected to regain and maintain its fair market share of room night demand. As the golf course comes on-line, the Hotel is expected to see its competitive advantage reflected in penetration rates over 100 percent. Through the year 2000, the Hotel is expected to capture, at the least, its fair share of room night demand in the primary luxury market, with penetration rates fluctuating between 100 and 105 percent.

While average daily rates in the primary luxury market have increased at a compound annual average rate of over seven percent between 1986 and 1991, increased competition in the luxury market has weakened the supply and demand relationship and the ability for luxury hotels to increase rates year after year. Consequently, annual growth in the Hotel Hana-Maui's rate of 5 percent was used, beginning with an average daily rate of $254 (1991 dollars). However, with the expected opening of the golf course in 1994, a premium 15 percent increase in the average daily room rate has been projected for that one year.

Estimates of the annual operating results for the Hotel Hana-Maui with the proposed Hana Ranch Country Club, for the twelve year period 1992-2003, is presented in Table 7.5.2. The Hotel's operating losses are projected to decrease steadily from $2,711,000 in 1992 to $1,240,000 in 2003.

Employment

It is expected that the 1991 (before layoffs) Hotel staffing level will be sufficient to service the projected increase in occupancy rates and corresponding number of guests with the golf course.

In 1991, the Hotel employed 190 full-time and 52 part-time employees, which is equivalent to 216 full-time employees. Industry staffing averages for primary luxury hotels approximate 2.0 employees per occupied room. In comparison, the Hotel Hana-Maui has 2.33 and 4.80 employees per available and occupied rooms, respectively. Although the Hotel Hana-Maui's higher ratio of employees may be due in part to the particular circumstances of the Hotel, the 1991 staffing levels should nevertheless be adequate to service the projected increase in occupancy levels without a further increase in staffing.

Table 7.5.2
Statement of Estimated Annual Operating Results With Golf Course, 1992 - 2003

HOTEL HANA MAUI
HANA, MAUI, HAWAII
STATEMENT OF ESTIMATED ANNUAL OPERATING RESULTS WITH GOLF COURSE
STATED IN INFLATED DOLLARS; 97 AVAILABLE ROOMS

OCCUPANCY LEVEL / AVERAGE DAILY ROOM RATE	1992 (4) 52.0% AI $266.70			1993 55.0% AI $280.00			1994 60.0% AI $322.00			1995 63.0% AI $338.10			1996 67.0% AI $355.00			1997 71.0% AI $372.80		
	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM
OPERATING DEPARTMENTS REVENUE																		
Rooms	$4,910,000	50.1%	$50,619	$5,452,000	50.1%	$56,206	$6,040,000	52.4%	$70,515	$7,561,000	52.4%	$77,742	$8,421,000	52.4%	$86,814	$9,371,000	52.4%	$96,608
Food	3,636,000	37.1%	37,464	4,036,000	37.1%	41,608	4,074,000	35.4%	47,670	5,097,000	35.4%	52,546	5,697,000	35.4%	58,680	6,335,000	35.4%	65,289
Beverage	812,000	8.3%	8,371	902,000	8.3%	9,299	1,015,000	7.9%	10,649	1,139,000	7.9%	11,742	1,271,000	7.9%	13,103	1,415,000	7.9%	14,588
Telephone	58,000	0.6%	598	64,000	0.6%	660	74,000	0.6%	766	81,000	0.6%	835	91,000	0.6%	938	101,000	0.6%	1,041
Other Operated Departments	87,000	0.9%	897	97,000	0.9%	1,000	111,000	0.9%	1,144	122,000	0.8%	1,258	137,000	0.9%	1,412	151,000	0.8%	1,557
Rentals and Other Income	290,000	3.0%	2,990	322,000	3.0%	3,320	369,000	2.8%	3,804	407,000	2.8%	4,196	454,000	2.8%	4,680	505,000	2.8%	5,206
Total Operating Departments	9,791,000	100.0%	100,939	10,873,000	100.0%	112,093	13,051,000	100.0%	136,545	14,387,000	100.0%	148,319	16,066,000	100.0%	165,627	17,876,000	100.0%	184,289
DEPARTMENTAL EXPENSES (1)																		
Rooms	2,013,000	41.0%	20,753	2,208,000	40.5%	22,763	2,736,000	40.0%	28,206	2,961,000	39.0%	30,520	3,200,000	38.0%	32,990	3,467,000	37.0%	35,742
Food and Beverage	4,668,000	105.0%	48,124	5,086,000	103.0%	52,433	5,716,000	101.0%	58,907	6,216,000	100.0%	64,289	6,893,000	99.0%	71,062	7,591,000	98.0%	78,238
Telephone	78,000	134.5%	804	85,000	133.0%	876	96,000	130.0%	990	104,000	128.0%	1,072	116,000	125.0%	1,195	131,000	122.0%	1,354
Other Operated Departments	104,000	120.0%	1,072	112,000	115.0%	1,155	126,000	112.0%	1,298	132,000	108.0%	1,361	144,000	105.0%	1,485	154,000	102.0%	1,588
Total Departmental Expenses	6,863,000	70.1%	70,753	7,491,000	68.9%	77,227	8,670,000	66.4%	89,381	9,413,000	65.4%	97,042	10,351,000	64.4%	106,732	11,337,000	63.4%	116,876
TOTAL OPERATING PROFIT	2,928,000	29.9%	30,186	3,382,000	31.1%	34,866	4,381,000	33.6%	45,164	4,974,000	34.6%	51,277	5,715,000	35.6%	58,915	6,539,000	36.6%	67,413
UNDISTRIBUTED OPERATING EXPENSES																		
Administrative and general	1,567,000	16.0%	16,155	1,685,000	15.5%	17,371	1,958,000	15.0%	20,186	2,014,000	14.0%	20,763	2,089,000	13.0%	21,536	2,215,000	12.4%	23,041
Management Fees	250,000	2.6%	2,577	250,000	2.3%	2,577	250,000	1.9%	2,577	250,000	1.7%	2,577	250,000	1.6%	2,577	250,000	1.4%	2,577
Marketing	979,000	10.0%	10,093	1,087,000	10.0%	11,206	1,240,000	9.5%	12,784	1,295,000	9.0%	13,351	1,366,000	8.5%	14,082	1,519,000	8.5%	15,660
Energy	411,000	4.2%	4,237	435,000	4.0%	4,485	483,000	3.7%	4,979	504,000	3.5%	5,196	546,000	3.4%	5,629	590,000	3.3%	6,082
Property Operation and Maintenance	1,958,000	20.0%	20,186	2,120,000	19.5%	21,856	2,416,000	18.5%	24,897	2,590,000	18.0%	26,701	2,731,000	17.0%	28,155	2,860,000	16.0%	29,485
Total Undistributed Operating Expenses	5,165,000	52.8%	53,248	5,577,000	51.3%	57,495	6,345,000	48.6%	65,413	6,653,000	46.2%	68,588	6,982,000	43.5%	71,979	7,434,000	41.7%	76,645
INCOME BEFORE FIXED CHARGES	(2,237,000)	-22.8%	(23,062)	(2,195,000)	-20.2%	(22,629)	(1,964,000)	-15.0%	(20,249)	(1,679,000)	-11.7%	(17,311)	(1,267,000)	-7.9%	(13,064)	(915,000)	-5.1%	(9,432)
FIXED CHARGES (2)																		
Incentive Management Fees																		
Taxes	166,000	1.7%	1,711	174,000	1.6%	1,794	183,000	1.4%	1,887	197,000	1.3%	1,979	202,000	1.3%	2,082	212,000	1.2%	2,186
Insurance	112,000	1.1%	1,155	118,000	1.1%	1,216	124,000	1.0%	1,278	130,000	0.9%	1,340	137,000	0.9%	1,412	143,000	0.8%	1,474
Total Fixed Charges	278,000	2.8%	2,866	292,000	2.7%	3,010	307,000	2.4%	3,165	322,000	2.2%	3,319	339,000	2.1%	3,494	355,000	2.0%	3,660
INCOME BEFORE RESERVE (3)	($2,515,000)	-25.7%	($25,928)	($2,487,000)	-22.9%	($25,639)	($2,271,000)	-17.4%	($23,416)	($2,001,000)	-13.9%	($20,630)	($1,606,000)	-10.0%	($16,558)	($1,270,000)	-7.1%	($13,092)
RESERVE FOR REPLACEMENT	196,000	2.0%	2,021	326,000	3.0%	3,361	392,000	3.0%	4,041	432,000	3.0%	4,456	482,000	3.0%	4,969	536,000	3.0%	5,526
INCOME AFTER RESERVE BUT BEFORE OTHER CHARGES	($2,711,000)	-27.7%	($27,949)	($2,813,000)	-25.9%	($29,000)	($2,663,000)	-20.6%	($27,455)	($2,433,000)	-16.9%	($25,084)	($2,088,000)	-13.0%	($21,527)	($1,806,000)	-10.1%	($18,618)

Notes: (1) Each departmental expense ratio is based on the department's estimated revenues.
(2) Fixed charges do not include interest expense, depreciation, amortization, or income taxes.
(3) Income before reserve for replacement, interest, depreciation, amortization and income tax.
(4) 12 months in operation the opening year.

Source: PKF Hawaii

Table 7.5.2 (continued)
Statement of Estimated Annual Operating Results With Golf Course, 1992 - 2003

[illegible] MAUI
KAHA, MAUI, HAWAII
STATEMENT OF ESTIMATED ANNUAL OPERATING RESULTS WITH GOLF COURSE
STATED IN INFLATED DOLLARS; 97 AVAILABLE ROOMS

OCCUPANCY LEVEL / AVERAGE DAILY ROOM RATE	1998 75.0%	AI $391.40		1999 75.0%	AI $411.00		2000 75.0%	AI $431.60		2001 75.0%	AI $453.10		2002 75.0%	AI $475.80		2003 75.0%	AI $499.60	
	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM	AMOUNT	%	AMOUNT /ROOM
OPERATING DEPARTMENTS REVENUES																		
Rooms	$10,393,000	52.4%	$307,166	$10,914,000	52.4%	$112,515	$11,461,000	52.4%	$118,155	$12,037,000	52.4%	$124,061	$12,636,000	52.4%	$130,247	$13,266,000	52.4%	$136,761
Food	7,024,000	35.4%	72,412	7,375,000	35.4%	76,031	7,744,000	35.4%	79,835	8,131,000	35.4%	83,825	8,538,000	35.4%	88,023	8,965,000	35.4%	92,423
Beverage	1,549,000	7.8%	16,175	1,647,000	7.8%	16,979	1,710,000	7.8%	17,835	1,816,000	7.8%	18,727	1,907,000	7.8%	19,660	2,002,000	7.8%	20,639
Telephone	113,000	0.6%	1,165	118,000	0.6%	1,216	124,000	0.6%	1,278	130,000	0.6%	1,340	137,000	0.6%	1,412	144,000	0.6%	1,485
Other Operated Departments	167,000	0.8%	1,722	176,000	0.8%	1,814	185,000	0.8%	1,907	194,000	0.8%	2,000	204,000	0.8%	2,103	214,000	0.8%	2,206
Rentals and Other Income	560,000	2.8%	5,773	588,000	2.8%	6,062	617,000	2.8%	6,361	648,000	2.8%	6,680	681,000	2.8%	7,021	715,000	2.8%	7,371
Total Operating Departments	19,826,000	99.9%	204,391	20,818,000	99.9%	214,617	21,861,000	99.9%	225,371	22,951,000	99.9%	236,680	24,101,000	99.9%	248,466	25,306,000	99.9%	260,887
DEPARTMENTAL EXPENSES (1)																		
Rooms	1,761,000	16.0%	18,567	1,979,000	16.0%	40,505	4,174,000	16.0%	42,516	4,317,000	16.0%	44,520	4,568,000	16.0%	46,887	4,776,000	16.0%	49,247
Food and Beverage	8,115,000	97.0%	85,928	8,757,000	97.0%	90,227	9,390,000	97.0%	96,762	9,650,000	97.0%	99,485	10,112,000	97.0%	104,456	9,980,000	91.0%	102,887
Telephone	136,000	120.0%	1,402	142,000	120.0%	1,466	149,000	120.0%	1,536	156,000	120.0%	1,608	164,000	120.0%	1,693	171,000	120.0%	1,764
Other Operated Departments	164,000	98.0%	1,691	172,000	98.0%	1,773	181,000	98.0%	1,866	190,000	98.0%	1,959	200,000	98.0%	2,062	210,000	98.0%	2,165
Total Departmental Expenses	12,376,000	62.4%	127,588	12,995,000	62.4%	133,969	13,646,000	62.4%	140,680	14,320,000	62.4%	147,712	15,044,000	62.4%	155,096	15,139,000	59.8%	156,071
TOTAL OPERATING PROFIT	7,450,000	37.5%	76,803	7,823,000	37.5%	80,648	8,215,000	37.5%	84,691	8,623,000	37.5%	88,896	9,057,000	37.5%	93,370	10,167,000	40.1%	104,816
UNDISTRIBUTED OPERATING EXPENSES																		
Administrative and general	2,379,000	12.0%	24,526	2,498,000	12.0%	25,753	2,623,000	12.0%	27,043	2,754,000	12.0%	28,397	2,892,000	12.0%	29,816	3,037,000	12.0%	31,309
Management Fees	250,000	1.3%	2,577	250,000	1.2%	2,577	250,000	1.1%	2,577	250,000	1.1%	2,577	250,000	1.0%	2,577	506,000	2.0%	5,218
Marketing	1,584,000	8.0%	16,331	1,665,000	8.0%	17,165	1,749,000	8.0%	18,031	1,836,000	8.0%	18,928	1,928,000	8.0%	19,876	2,024,000	8.0%	20,868
Energy	505,000	1.0%	5,206	425,000	1.0%	6,443	656,000	1.0%	6,763	689,000	1.0%	7,103	723,000	1.0%	7,456	759,000	1.0%	7,825
Property Operation and Maintenance	2,974,000	15.0%	30,660	3,323,000	15.0%	32,196	3,279,000	15.0%	33,804	3,443,000	15.0%	35,495	3,615,000	15.0%	37,268	3,796,000	15.0%	39,134
Total Undistributed Operating Expenses	7,786,000	39.3%	80,268	8,161,000	39.2%	84,134	8,557,000	39.1%	88,218	8,972,000	39.1%	92,495	9,408,000	39.0%	96,989	10,122,000	40.0%	104,350
INCOME BEFORE FIXED CHARGES	(336,000)	1.8%	(3,465)	(338,000)	-1.7%	(3,486)	(342,000)	-1.7%	(3,525)	(349,000)	1.6%	(3,599)	(351,000)	1.6%	(3,619)	45,000	0.1%	464
FIXED CHARGES (2)																		
Incentive Management Fees	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	65,000	0.3%	670
Taxes	222,000	1.1%	2,289	233,000	1.1%	2,402	245,000	1.1%	2,526	257,000	1.1%	2,649	270,000	1.1%	2,784	284,000	1.1%	2,928
Insurance	151,000	0.8%	1,557	158,000	0.8%	1,629	166,000	0.8%	1,711	176,000	0.8%	1,796	181,000	0.8%	1,867	177,000	0.7%	1,825
Total Fixed Charges	373,000	1.9%	3,846	391,000	1.9%	4,031	411,000	1.9%	4,237	431,000	1.9%	4,445	451,000	1.9%	4,651	526,000	2.1%	5,423
INCOME BEFORE RESERVE (3)	($709,000)	-3.7%	($7,291)	($729,000)	-3.6%	($7,517)	($753,000)	-3.5%	($7,762)	($780,000)	-3.5%	($8,042)	($804,000)	-3.4%	($8,290)	($481,000)	2.0%	($4,959)
RESERVE FOR REPLACEMENT	793,000	4.0%	8,175	851,000	4.0%	8,588	874,000	4.0%	9,010	689,000	3.0%	7,103	723,000	3.0%	7,456	759,000	3.0%	7,825
INCOME AFTER RESERVE BUT BEFORE OTHER CHARGES	($1,500,000)	-7.7%	($15,466)	($1,562,000)	-7.6%	($16,105)	($1,627,000)	-7.5%	($16,772)	($1,469,000)	-6.5%	($15,145)	($1,527,000)	-6.4%	($15,744)	($1,240,000)	5.0%	($12,784)

Notes: (1) Each departmental expense ratio is based on the department's estimated revenues.
(2) Fixed charges do not include interest expense, depreciation, amortization, or income taxes.
(3) Income before reserve for replacement, interest, depreciation, amortization and income tax.
(4) 12 months in operation the opening year.

Source: PKF Hawaii

7.5.3.2 Combined Hotel and Golf Course Financial Summary

The combined operating losses of the Hotel Hana-Maui and the Hana Ranch Country Club shown on Table 7.5.3 is projected to be significantly lower than the losses incurred by the Hotel without a golf course. As previously discussed in Section 5.1, the Hotel without a golf course is projected to incur an estimated aggregate loss of $32,400,000 for the years 1992-2003.

In comparison, the combined aggregate operating loss for the Hotel and golf course for the same period is projected to be $19,200,000 or an improvement of $13,200,000. The earnings improvement is the result of profits generated by the golf course, and reduced Hotel operating losses with the higher occupancy rates associated with the golf course.

Moreover, the projections for the combined Hotel and golf course show a positive trend of reduced losses that would become net operating income, but the Hotel without a golf course will continue to lose large sums of money indefinitely. Assuming no changes to the Hotel, except for the proposed golf course, and based on the projected trending of the golf course and Hotel, the combined operations are expected to be profitable in the year 2014. Should there be a significant turn in events of higher than projected occupancy, average daily rate, green fees, rounds of golf or a substantial decrease in expenses, combined profits would be realized sooner.

Table 7.5.3
Combined Hotel and Golf Course Operating Results

HOTEL NANA MAUI AND
NANA RANCH COUNTRY CLUB
STATEMENT OF ESTIMATED COMBINED NET OPERATING INCOME (LOSS)
COMPARED TO HOTEL NANA WITHOUT GOLF COURSE

	HOTEL				GOLF					COMBINED	HOTEL WITHOUT GOLF COURSE				
YEAR	OCCUPANCY	AVERAGE DAILY RATE	GROSS REVENUE	NET OPERATING INCOME (LOSS)	ANNUAL ROUNDS	AVERAGE GREEN FEES	GROSS REVENUE	NET OPERATING INCOME (LOSS)	INTEREST INCOME	NET OPERATING INCOME (LOSS)	OCCUPANCY	AVERAGE DAILY RATE	GROSS REVENUE	NET OPERATING INCOME (LOSS)	NET OPERATING LOSS DIFFERENCE
1992	52.0%	$266.70	$9,791,000	($2,711,000)	-	-	-	-	-	($2,711,000)	52.0%	$266.70	$9,791,000	($2,711,000)	$0
1993	55.0%	280.00	10,873,000	(2,813,000)	-	-	-	-	-	(2,813,000)	55.0%	280.00	10,873,000	(2,813,000)	0
1994	60.0%	322.00	13,051,000	(2,663,000)	18,883	$88	$2,650,000	($334,000)	-	(2,997,000)	57.0%	294.00	11,834,000	(2,727,000)	270,000
1995	63.0%	338.10	14,387,000	(2,433,000)	19,827	93	2,921,000	(246,000)	731,000	(1,948,000)	59.0%	308.70	12,858,000	(2,557,000)	(609,000)
1996	67.0%	355.00	16,066,000	(2,088,000)	21,086	97	3,264,000	(121,000)	614,000	(1,595,000)	60.0%	324.20	13,734,000	(2,255,000)	(660,000)
1997	71.0%	372.80	17,876,000	(1,806,000)	22,344	102	3,631,000	28,000	518,000	(1,260,000)	60.0%	340.40	14,420,000	(2,356,000)	(1,096,000)
1998	75.0%	391.40	19,826,000	(1,500,000)	23,603	107	4,026,000	190,000	443,000	(867,000)	60.0%	357.40	15,141,000	(2,610,000)	(1,743,000)
1999	75.0%	411.00	20,818,000	(1,562,000)	23,603	113	4,228,000	199,000	391,000	(972,000)	60.0%	375.30	15,899,000	(2,729,000)	(1,757,000)
2000	75.0%	431.60	21,861,000	(1,627,000)	23,603	118	4,439,000	208,000	332,000	(1,087,000)	60.0%	394.00	16,693,000	(2,853,000)	(1,766,000)
2001	75.0%	453.10	22,951,000	(1,469,000)	23,603	124	4,662,000	220,000	267,000	(982,000)	60.0%	413.70	17,527,000	(2,886,000)	(1,874,000)
2002	75.0%	475.80	24,101,000	(1,527,000)	23,603	130	4,895,000	230,000	208,000	(1,089,000)	60.0%	434.40	18,404,000	(2,935,000)	(1,846,000)
2003	75.0%	499.60	25,306,000	(1,240,000)	23,603	137	5,140,000	244,000	143,000	(853,000)	60.0%	456.10	19,323,000	(3,012,000)	(2,159,000)

SOURCE: PANNELL KERR FORSTER

Source: PKF Hawaii

7.6 FISCAL AND OTHER ECONOMIC IMPACTS

The increased activity resulting from the project will benefit the County of Maui and ultimately the Hana District through additional tax revenues. PKF estimated the potential tax revenues from individual State income taxes, general excise taxes, real property taxes, and transient accommodations taxes. In addition, tax impacts from secondary sources and other employment-related economic impacts are discussed.

7.6.1 INDIVIDUAL STATE INCOME TAX

This tax represents the income tax that individuals would have to pay on earnings resulting from employment on construction of the golf course and in its operation. State income taxes are initially put into the State General Fund and subsequently allocated to the Counties by the State Legislature. For the purposes of this study, it was assumed that all individual State income taxes raised in Maui would be allocated back to the County:

Golf course construction employment	$636,000
Golf course operations employment (1994-2003)	784,000
Total	$1,420,000

7.6.2 GENERAL EXCISE TAX

General excise tax is imposed on the sale of virtually all goods and services in the State of Hawaii. General excise taxes are also put into the State General Fund and subsequently allocated to the Counties by the State Legislature. For the purposes of this study, it was also assumed that all general excise taxes raised in Maui would be allocated to the County. The general excise tax on the incremental revenues derived from the Hotel operations with a golf course and the gross revenues from the golf course operation was estimated to be $3,211,000 over the ten year projection period 1994-2003.

7.6.3 REAL PROPERTY TAX

Real property tax is levied at the County level and is used to support public programs in each respective County. Currently, resort courses are assessed at $70,000 per acre, with a tax rate at $4.75 per $1,000 of assessment. Based on the current assessment amounts and assuming a 5 percent annual valuation increase, real property tax revenues to the County of Maui are estimated to be $842,000 (based on 201 acres) for the ten year period 1994-2003.

7.6.4 TRANSIENT ACCOMMODATIONS TAX

The State allocates back to the Counties 95 percent of the transient accommodations tax collected by the State. In 1989, the County of Maui collected 23.2 percent of the total transient accommodations tax and received 22.8 percent from the State. Assuming the percentage of 1989 tax collections remains the same for the period under study, the estimated transient accommodations tax to the County of Maui for the ten year projection period is $1,216,000.

7.6.5 OTHER TAX IMPACTS

In addition to the above taxes from primary sources, other tax impacts would be generated from secondary sources due to the economic multiplier effect of an expanded economic base. Such impacts would include sources such as retail and wholesale operations that support the golf course and Hotel, and the spending by additional guests coming to the resort. The increased incomes of Hotel and golf course employees would also increase income levels of other sectors in the Hana community as more spending would spread throughout the local economy.

7.6.6 OTHER ECONOMIC IMPACTS

In addition to the economic impact from the golf course operations, the project will also create jobs and infuse additional payroll expenditures in the Hana area. The golf course will employ approximately 36 full-time employees for grounds maintenance, golf operations, food and beverage and administrative support with total salaries of approximately $619,000. In addition, it is expected that Keola employees from other operations and Hana residents will be employed on a part-time basis, which would generate even larger payroll expenditures. Golf course construction payroll expenditures are estimated to be $7,650,000, of which approximately 10 percent would be earned by Hana residents.

SECTION 8.0
INFRASTRUCTURE AND PUBLIC FACILITIES

8.1 WATER SUPPLY

A study was conducted by Water Resource Associates to assess the probable impacts to water systems in the area resulting from the project. Their report is summarized below and included in Appendix D.

8.1.1 EXISTING CONDITIONS

8.1.1.1 Keola Water System

Keola operates its own water system to supply the water needs of its residential subdivision, Hotel Hana-Maui, Ranch Restaurant, and commercial center. This privately owned system has two deep well sources which are the Wananalua and Helani wells. The installed pump capacity of these two sources totals 0.60 million gallons per day (mgd).

Keola's Wananalua well is located about a half mile from the project site at an elevation of 410 feet. This well has a pump capacity of 0.43 mgd, but was recently tested (December 19, 1991) to have a capacity of 0.57 mgd. Water flows by gravity through a 12-inch pipeline to a 500,000 gallon storage tank located at an elevation of 314 feet. Additional storage is provided by two 50,000 gallon redwood tanks located at approximately the 250-foot elevation. The pump is outfitted with an emergency generator to supply electric power in events of power outages. This well had an average daily pumpage of 0.285 mgd in 1991.

The Helani well is located a mile north of the Wananalua well at an elevation of 250 feet and serves as a standby water source for the Keola water system. This well has an installed pump capacity of 0.17 mgd and the pump is operated and flushed each Thursday for a short period of maintenance. The capacity of the Helani well is estimated to be 0.20 mgd based upon limited information. The well is connected to the 500,000 gallon Wananalua storage tank by 7,500 feet of 6-inch pipeline.

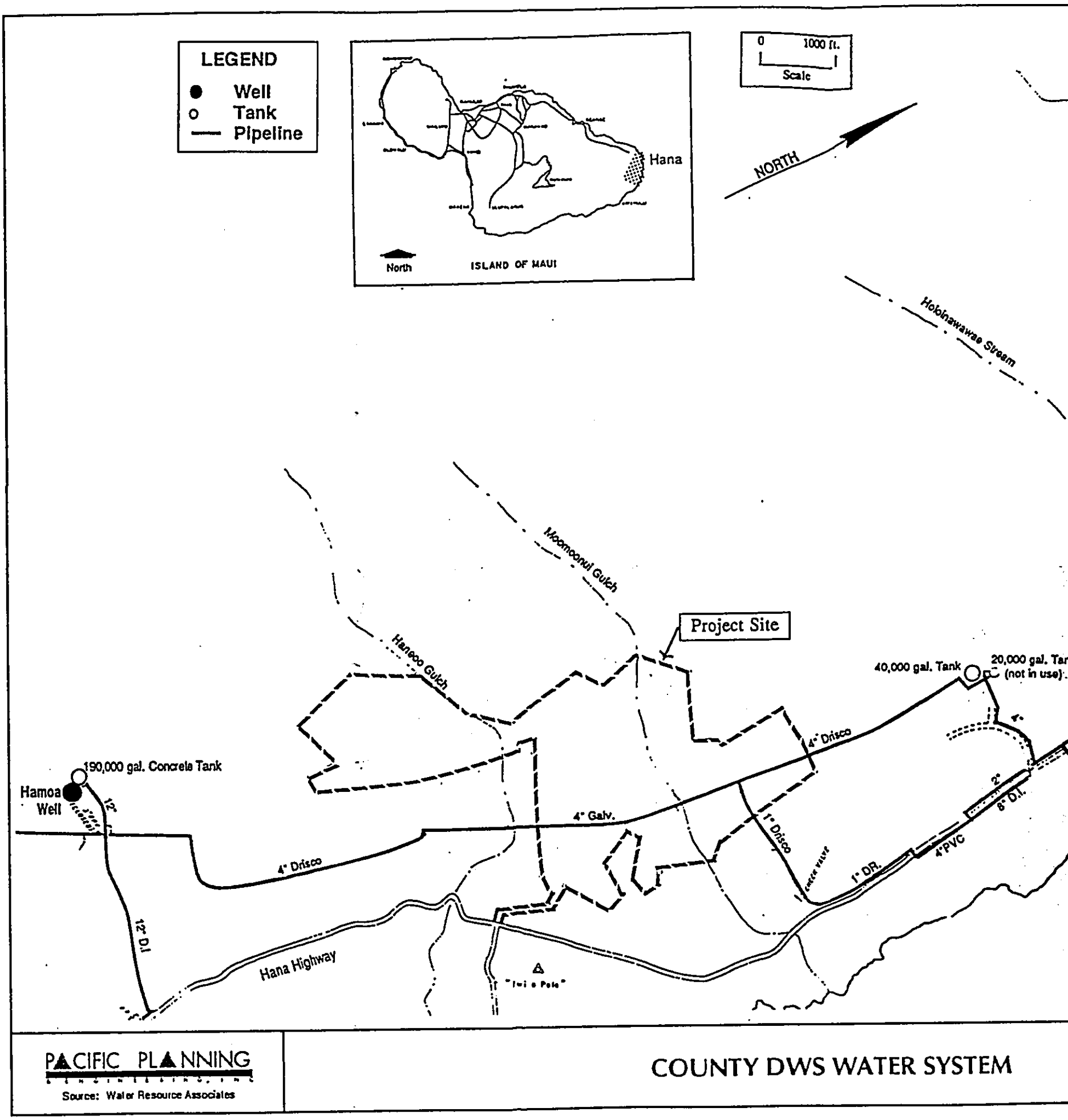
The Wananalua and Helani wells both produce good quality potable water with chloride contents of 60 ppm and 110± ppm, respectively. Based upon information provided by Keola's engineer, the water system currently meets all of its water needs from the Wananalua well. Monthly records of pumpage from the Wananalua well averaged 0.13 mgd for 1990 and 0.28 mgd for 1991.

8.1.1.2 Maui County Water System

The municipal water needs for a portion of Hana town and Hamoa are provided by the Maui Department of Water Supply's Hana water system. The system is supplied by three deep wells, two at Wakiu and one at Hamoa, located at the north and south ends of the system, respectively. A series of pipelines connect the Wakiu source to Hana and a 4-inch pipeline, which passes through a portion of the project site, connects the Hamoa well to a storage tank above Hana town. This water system is shown on Figure 8.1.1. The Hamoa well primarily serves Hamoa and Hana. Besides this tank, major storage for the system is provided by a 500,000 gallon concrete tank next to the Wakiu wells and a 190,000 gallon concrete tank next to the Hamoa well.

The County system also includes a surface water source located on Wailua stream (6.5 miles south of Hana) at the 1,000-foot elevation, which serves the Wailua area outside of the study area. The estimated available yield of surface water is 0.10 mgd based upon an average metered flow of 0.12 mgd in the 4-inch Wailua transmission pipeline (Hirota, 1983).

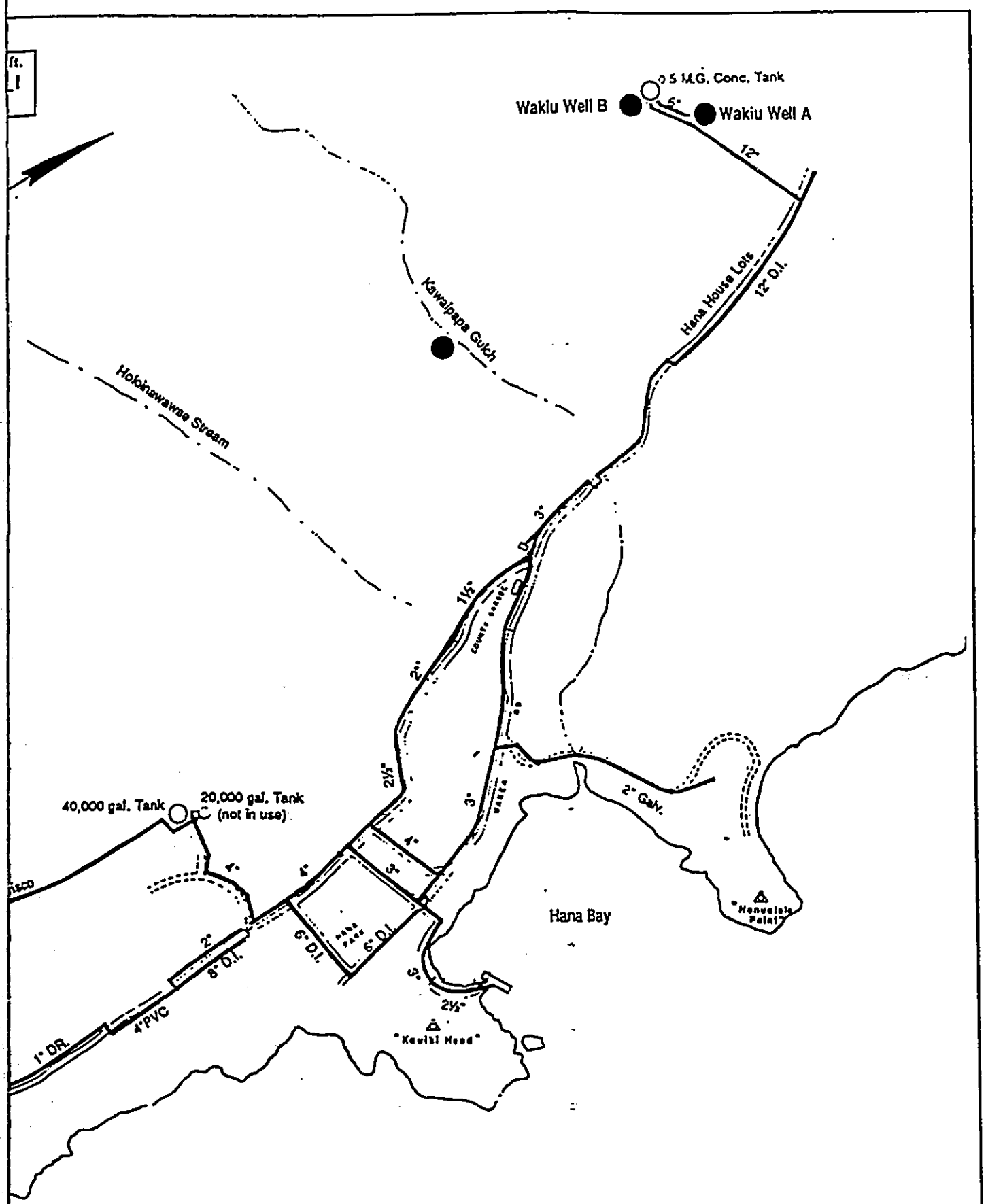
According to the 1990 Maui Water Use and Development Plan, the total pump capacity of the County's Hana water system is 0.6 mgd (Wakiu wells, 0.2 mgd; Wailua surface water source, 0.1 mgd; and Hamoa well, 0.3 mgd). According to this report, these sources are expected to meet the water needs of the Hana-Hamoa-Wailua area to the year 2010. The Hamoa well alone is capable of producing 1.0 mgd and could meet the water needs beyond the year 2010 by installing a larger capacity pump.



PACIFIC PLANNING & ENGINEERING, INC.

Source: Water Resource Associates

COUNTY DWS WATER SYSTEM



WATER SYSTEM	Figure 8.1.1

Based upon pumpage records for 1990 and 1991 shown in Table 8.1.1, water use by the County's Hana Water System has been less than 0.15 mgd.

Table 8.1.1. Average Annual Pumpage, Hana Water System

Source	1990	1991
Hamoa Well	0.048	0.042
Wakiu Wells	0.100	0.054
Total	0.148 mgd	0.096 mgd

Source of Data: Maui County Department of Water Supply

8.1.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, future potable water requirements were estimated based upon the forecast increase in resident population in Hana of 2,040 residents in 1995. This forecast population was then converted to households using data from the 1990 U.S. Census. The resulting number of households were then used to estimate the future water demand based upon domestic consumption guidelines provided in the Maui Department of Water Supply Water System Standards. The increase in potable water consumption in the year 1995 is estimated to be about 28,200 gpd.

This projected increase in water consumption would result in a 20 to 30 percent increase over 1990 and 1991 consumption rates shown on Table 8.1.1. Given the existing potable water capacity serving the Hana district, this increase should have minimal impacts on the County's existing water system.

Proposed Project

Project Water Requirements

The project will require potable water service to support clubhouse activities and non-potable water to service golf course operations. The estimated potable water requirement for clubhouse facilities is between 20,000 and 30,000 gallons per day (gpd) based upon typical usage for a clubhouse.

The project would add 36 full-time jobs which may result in up to 36 additional households. Using the domestic consumption guidelines provided in the Water System Standards, up to 21,600 gpd of potable water demand may result for these additional households. Therefore, the project may increase potable water demand up to 51,600 gpd due to clubhouse facilities and additional households. Based upon Maui Department of Water Supply standards, fire protection for the clubhouse will require a reserve storage capacity of 240,000 gallons.

The project is located in an area with an average rainfall of about 70 inches a year indicating irrigation may not be required. However, in practice, irrigation will be required because of the uneven distribution of rainfall during the year. The irrigation requirement for the proposed golf course is estimated to average 70,000 gpd, with a maximum month requirement of 100,000 gpd. This estimate is based upon data obtained for the Oahu Country Club and Pali Golf course which are located in areas similar to the project site.

Proposed Water System

To meet the potable water required for the clubhouse and maintenance facility, Keola will request water service from the Maui Department of Water Supply's existing 4-inch transmission pipeline which passes through the project site. If this request is not approved, Keola will construct the necessary water supply improvements to provide potable water from its Wananalua well source located north of the project site. These improvements will meet State Department of Health and Maui Department of Water Supply requirements.

The County currently requires the use of non-potable water for the irrigation of future golf course developments. To meet this requirement, Keola plans to restore and utilize an existing five acre catchment reservoir with a natural hillside rain catchment area of approximately 30 acres. This formerly used reservoir (Puu Kolo reservoir) lies at an elevation of 800 feet mauka of Puu Kolo and the project site. When the Puu Kolo reservoir is restored, it will have a storage capacity of approximately 13 million gallons and supply an estimated average of 91,000 gpd. Nonpotable water from this reservoir will be gravity-fed to the golf course irrigation system and lakes via a new pipeline.

Water supply for fire flow protection of the clubhouse and maintenance facility will be provided by one of two nearby lakes created for the golf course. The lake will have a storage capacity of approximately 2.1 million gallons, which exceeds the minimum storage requirement of 240,000 gallons. All requirements for fire protection will conform to Maui Department of Water Supply standards.

Probable Impacts on Water System

The withdrawal of up to 0.05 mgd (51,600 gpd) of potable ground water for the clubhouse facilities and additional households will not have an adverse impact on the Kawaipapa Aquifer System which has an estimated sustainable yield of 48 mgd. Seven wells have been drilled in this aquifer system and altogether they have an installed pump capacity of 1.5 mgd and currently use less than 1.0 mgd, or 2 percent, of the sustainable yield.

The withdrawal of an additional 0.05 mgd of potable ground water from either the Hamoa or Wananalua well will not have any adverse long-term effect on either of the two sources or any of the other existing sources in the Kawaipapa Aquifer System. The Hamoa well has an installed pump capacity of 0.30 mgd (tested potential yield of 1.0 mgd) which is more than adequate to meet the projected water demand. The Wananalua well has an existing pump capacity of 0.43 mgd and a tested potential yield of 0.57 mgd which is also more than adequate to meet projected water demands.

The project's water demand of 0.05 mgd along with 0.03 mgd associated with increased resident population under the No-Action Alternative would create a total potable water demand of up to 0.08 mgd. Given the current capacity of the water system serving Hana, there should be no adverse impacts to the system. Further, the increased demand generated by the project will not require a new pump for the County's wells.

The proposed use of untreated water from the rain catchment system would be in compliance with Maui County's recently enacted ordinance prohibiting the use of potable water for golf course irrigation. It would also be consistent with the State Water Commission's regulatory policy recommending that only water of equal or better quality be applied on lands overlying potable water aquifers.

The probable impact and potential mitigation measures resulting from the use of fertilizers and pesticides associated with golf course operations are discussed in Section 6.3.

8.2 WASTEWATER TREATMENT AND DISPOSAL

8.2.1 EXISTING CONDITIONS

There are presently no municipal sewage systems or sewage treatment facilities in the Hana district. Residences and small businesses in the region rely primarily on on-site, individual wastewater treatment systems such as septic tanks, cesspools, and packaged treatment plants.

Currently, treatment systems used for public facilities and residences require the sludge be removed by the County and disposed of at pump stations feeding wastewater treatment facilities. Commercial operations in Hana are not serviced by the County. Discussions with staff from the Maui Department of Public Works (DPW) indicate that the majority of septic tanks do not require regular disposal of accumulated sludge.

The Wailuku-Kahului Wastewater Reclamation Facility (WWRF) located in Wailuku is the closest municipal wastewater treatment facility to the Hana district. This facility is the County's primary wastewater facility serving the Central Maui area, and is a secondary, activated-sludge treatment facility having a current design capacity of 6 mgd. Effluents from the facility are disposed of via a series of four injection wells located along the coastline. Current plans by the County are to upgrade the facility by increasing its processing capacity to 7.9 mgd by late 1992. The average flows presently received at the plant are approximately 5.4 mgd.

8.2.2 PROBABLE IMPACTS

<u>No-Action Alternative</u>

Under the No-Action Alternative, additional wastewater is expected to be generated by the projected increase in population in the year 1995. Hana's population is projected to increase to approximately 2,040 residents which translates into 40 additional housing units. Consequently, it is estimated that an additional 10,000 gpd of wastewater would be generated by the increased population.

As with existing residences in the Hana district, this increased wastewater would be disposed of via septic tanks, cesspools or packaged treatment plants. Accumulated sludge would be periodically removed by the County and disposed of at pump stations feeding the WWRF. This infrequent and relatively low amounts of sludge processed at this facility is not expected to impact the processing capacity of the facility resulting in minimal or no impact.

Proposed Project

The project is expected to create additional wastewater generated from clubhouse facilities and additional housing units for employees. Users of the clubhouse facilities are expected to generate an average of 13,400 gpd of wastewater, and up to 9,000 gpd may be generated by the potential in-migration of workers associated with the project. Therefore, a total of 22,400 gpd of sewage is projected to be generated by the project.

A packaged aerobic treatment plant and leaching field system is proposed to handle the wastewater from the clubhouse, and septic tanks will be utilized for the comfort stations along the golf course. This treatment plant and leaching field will be located in an open area adjacent to the driving range and northeast of the clubhouse site. Keola will be responsible for installing and maintaining the aerobic treatment system and septic tanks. These facilities will be appropriately designed and sized with sufficient allowance for accommodating peak flows.

Accumulated sludge will be infrequently pumped out and disposed of at the Kahului Wastewater Pump Station (KWPS). This plan is based upon current sludge disposal practices employed by the County's Department of Public Works and private cesspool pumping firms serving the Hana area. Housing units associated with additional jobs are expected to process wastewater using facilities similar to existing residences, and have accumulated sludge periodically disposed of by the County. The KWPS is expected to have sufficient capacity to process the small and infrequent residual solid loads from the project resulting in minimal or no impact to their operation.

8.3 SOLID WASTE DISPOSAL

8.3.1 EXISTING CONDITIONS

The Hana Landfill is a County maintained facility serving the Hana district. This landfill is a 30 acre site located makai of Hana Highway near Kainalimo Cove. County Public Works staff have indicated that the site is about 20 percent filled and has an estimated remaining life of 20 to 25 years. The landfill site receives trash from both public and private sectors.

The County DPW currently does not take measurements pertaining to the capacity of the Hana landfill or solid waste generation rates of the Hana community. However, using the Comprehensive Solid Waste Management Plan 1989 (CSWMP) prepared for the County of Maui, it is estimated that the Hana landfill receives about 6 to 8 tons per day (tpd) of trash. County refuse collectors provide solid waste collection and disposal services in Hana twice a week. The County currently has two employees working at the Hana landfill site.

Commercial businesses and various private residences have their solid wastes collected and disposed of by private refuse collection services or perform these services themselves. Keola presently uses a private contractor for their Hotel operations which amounts to three loads (0.25 - 0.30 tpd) per day while their ranch operations contribute minimal amounts of solid waste. Keola is currently participating in recycling efforts to reduce the number and amount of daily solid waste loads being disposed of at the landfill site. Limbs, branches, cuttings, clippings, flowers and other plant materials are presently disposed of at their composting site.

8.3.2 PROBABLE IMPACTS

No-Action Alternative

The increase in resident population forecast to occur in Hana by the year 1995 will result in increased trash being collected and disposed of at the Hana landfill. Using the CSWMP, the additional residents are estimated to generate about 0.30 tpd of solid waste. This slight increase in solid waste disposed at the site should have minimal impacts to the life of the landfill site and operations conducted there.

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Commercial businesses and various private residences have their solid wastes collected and disposed of by private refuse collection services or perform these services themselves. Keola presently uses a private contractor for their Hotel operations which amounts to three loads (0.25 - 0.30 tpd) per day while their ranch operations contribute minimal amounts of solid waste. Keola is currently participating in recycling efforts to reduce the number and amount of daily solid waste loads being disposed of at the landfill site. Limbs, branches, cuttings, clippings, flowers and other plant materials are presently disposed of at their composting site.

8.3.2 PROBABLE IMPACTS

No-Action Alternative

The increase in resident population forecast to occur in Hana by the year 1995 will result in increased trash being collected and disposed of at the Hana landfill. Using the CSWMP, the additional residents are estimated to generate about 0.30 tpd of solid waste. This slight increase in solid waste disposed at the site should have minimal impacts to the life of the landfill site and operations conducted there.

Proposed Project

The project will contribute to increased solid waste disposal at the Hana landfill site primarily resulting from clubhouse activities. Additional households associated with the project would also contribute to increased amount of solid waste. Up to 1.60 tpd of solid waste may be generated by clubhouse activities and additional households.

Trash collected from the golf course will be collected and disposed of by a private contractor. Keola plans to utilize the organic wastes generated by maintenance and landscaping activities for the golf course for mulching and composting purposes. A compactor for bulk waste is also planned to be used to further reduce land fill loads.

The County DPW staff believe the increase in trash would not create problems for their operation since they are capable of accommodating additional daily loads of solid waste. The relatively small amount of rubbish generated by the project should also have a negligible effect on the life of the landfill which has sufficient capacity to accommodate increased solid waste loads for many years. As a result, there should be no adverse impacts to the Hana landfill site and County operations.

Plans to promote and encourage recycling, reuse, and waste reduction practices by the project's employees, members, and guests will further minimize the increased amount of solid wastes disposed at the Hana landfill.

8.4 TRANSPORTATION FACILITIES

A traffic impact assessment report was prepared by Pacific Planning & Engineering, Inc. to identify and assess future traffic impacts associated with the project. Their report is summarized below and included in its entirety in Appendix M.

8.4.1 EXISTING CONDITIONS

Roadway Facilities

Hana Highway is a State maintained highway and is the only roadway providing vehicular access to the district of Hana and project site. However, from Hana Harbor to its end in Kipahulu, Hana Highway is maintained by Maui County. In the Hana district, this highway was not built to current Maui County standards. This highway is a winding road that runs through many bridges in the district some of which are wide enough for only one vehicle to proceed at a time. Between Hana High and Elementary School and Hana Ranch Town Center, the highway was recently resurfaced. At its intersection with Haneoo Road near the project site, Hana Highway has 10 foot wide lanes in each direction along with grassed shoulders ranging from 4 to 10 feet wide on both sides. The posted speed limit along Hana Highway varies between 15 and 35 mph in this district. Near the project site it has a posted speed limit of 35 mph.

Haneoo Road is a County maintained roadway that forms a stop-controlled unsignalized T-intersection with Hana Highway. This road is primarily used by residents living in the district and along the coastline. The road has a total pavement width of 12 feet with 6 foot grassed shoulders on both sides.

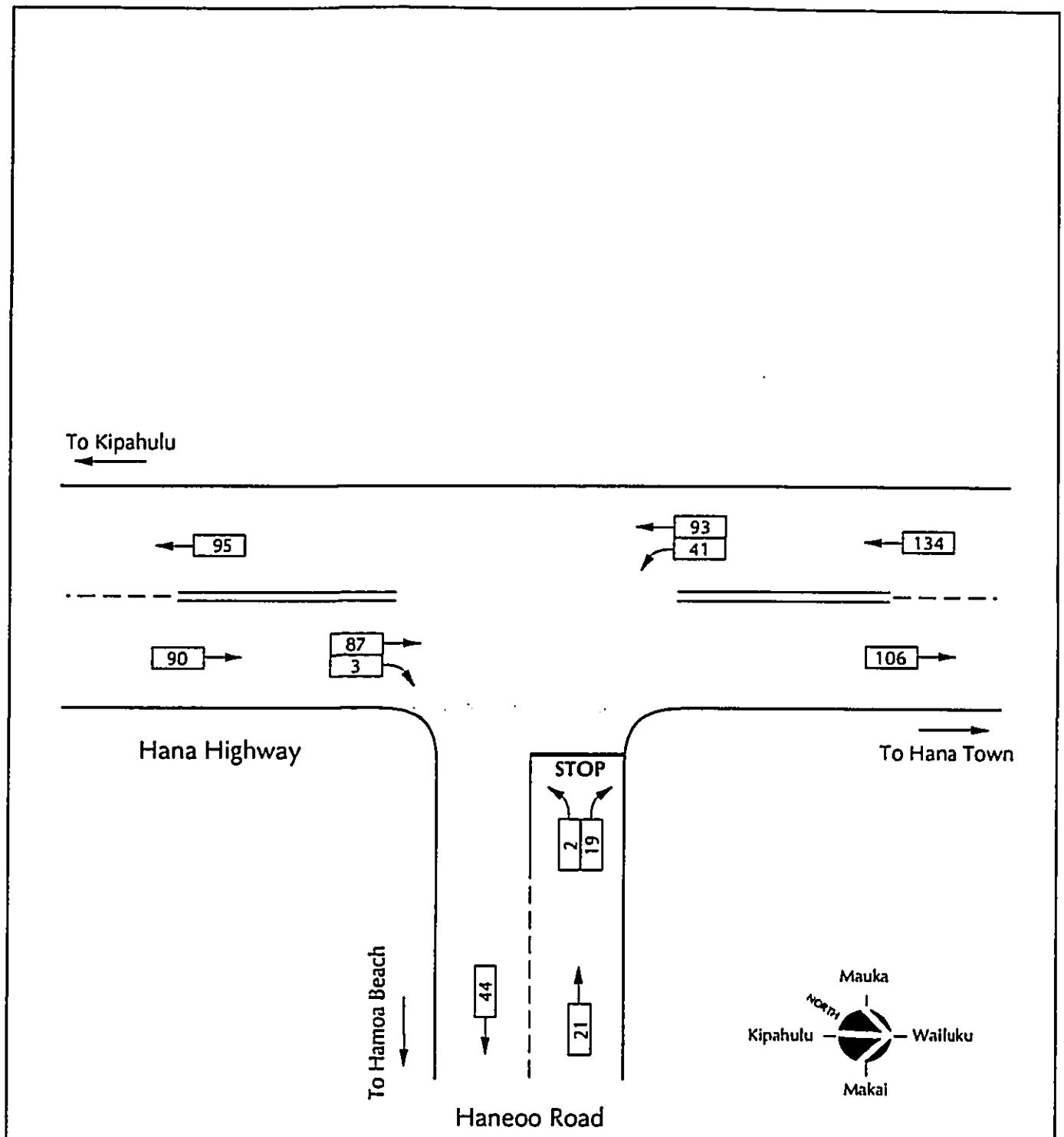
Existing Traffic Conditions

Manual counts were taken of passenger cars, trucks and buses at the intersection of Hana Highway with Haneoo Road near the project site. Based upon the traffic counts collected, it was determined that the afternoon peak hour occurred from 2:00 to 3:00 pm. Figure 8.4.1 shows the afternoon peak hour traffic volumes obtained at the study intersection.

Presently, drivers attempting left-turns from Hana Highway into Haneoo Road experience little or no traffic delays during the afternoon peak hour. Drivers attempting turning movements from Haneoo Road onto Hana Highway also experience little or no traffic delays.

8.4.2 PROBABLE IMPACTS

The intersection of Hana Highway with Haneoo Road was analyzed to determine probable impacts on the roadway system. Impacts were measured by the change in Level-of-Service (LOS) using the methodology for analyzing unsignalized intersections from the Highway Capacity Manual (Special Report 209, 1986). The LOS are classified into six categories ranging from little or no delay (LOS A) to extremely long traffic delays (LOS F). This analysis was performed using the existing and forecasted weekday afternoon peak hour volumes and are shown below on Table 8.4.1.



PACIFIC PLANNING & ENGINEERING, INC.

Source: Pacific Planning & Engineering, Inc.

1990 EXISTING AFTERNOON

Figure 8.4.1

Table 8.4.1. Unsignalized Intersection Analysis Results
Afternoon Peak Hour

Turning Movement		1990 Existing Conditions	1995 No-Action	1995 Project
Hana Highway				
Northbound (to Wailuku)	LT	n/a	n/a	A
Southbound (to Kipahulu)	LT	A	A	A
Haneoo Road				
Westbound (mauka)	LT	A	A	A
	TH	n/a	n/a	A
	RT	A	A	A
Project Access Road				
Eastbound (makai)	LT	n/a	n/a	A
	TH	n/a	n/a	A
	RT	n/a	n/a	A

n/a - Not Applicable

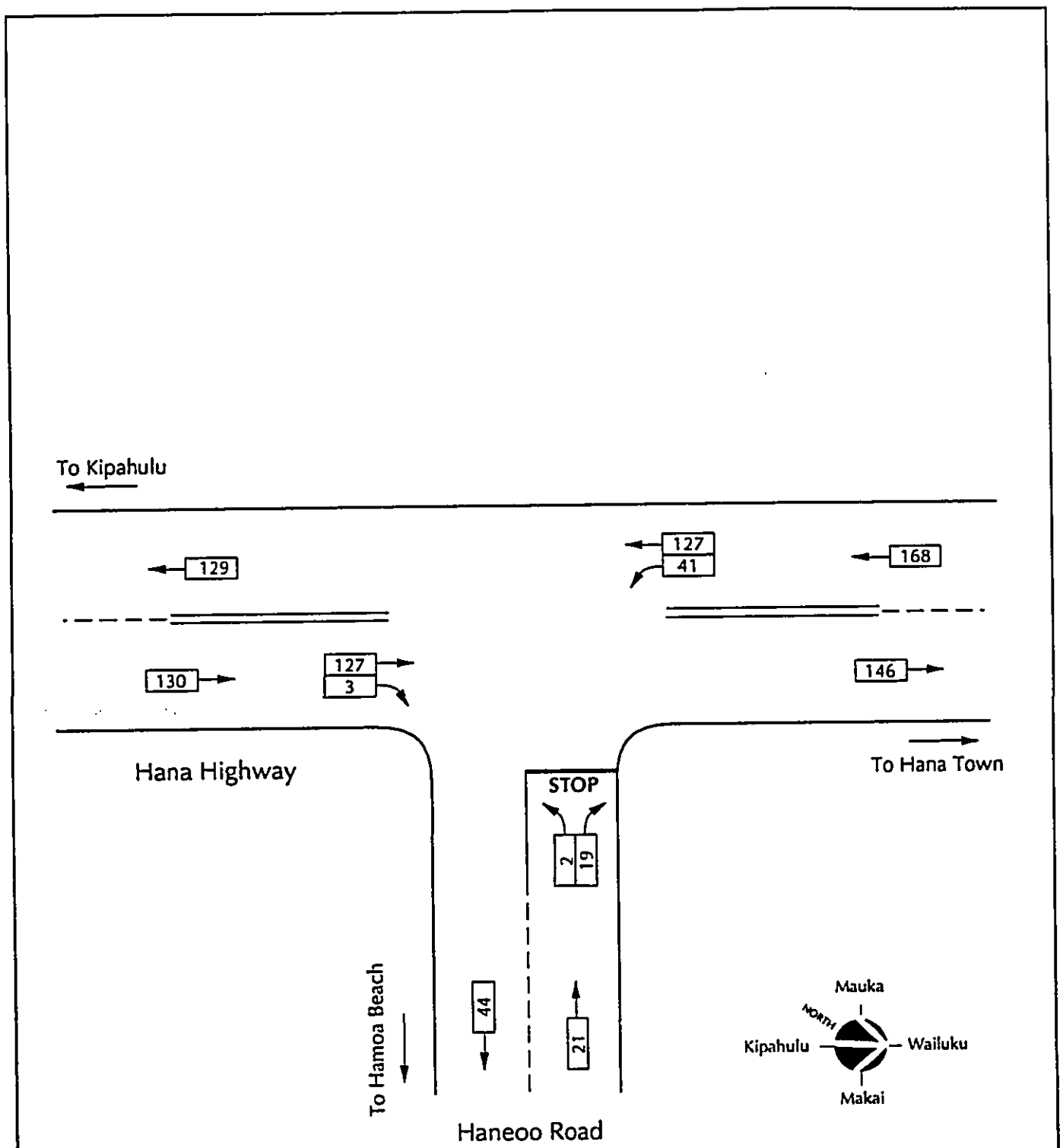
Source: Pacific Planning & Engineering, Inc.

No-Action Alternative

Future traffic without the project was forecast by increasing the existing through-traffic volumes along Hana Highway by the projected growth rate, and by adding additional traffic generated by proposed future developments. Figure 8.4.2 shows the forecasted traffic without the project in 1995.

The results of a linear regression analysis based upon historical traffic data collected over the past 13 years indicates an annual growth rate of approximately 3.5 percent a year along Hana Highway. Thus, existing afternoon peak hour through-traffic volumes on Hana Highway were increased by 18 percent (3.5 percent for 5 years).

Research of planned developments and improvements to transportation facilities were conducted. The Hana Village Marketplace and a public housing project are expected to generate traffic at the study intersection of Hana Highway with Haneoo Road by the year 1995. A three-step procedure of trip generation, trip distribution, and traffic assignment was used to forecast future traffic generated by these developments.



PACIFIC PLANNING & ENGINEERING, INC.

Source: Pacific Planning & Engineering, Inc.

1995 FORECASTS WITHOUT PROJECT AFTERNOON PEAK HOUR

Figure 8.4.2

Without the project in 1995, drivers attempting left-turns from Hana Highway into Haneoo Road will experience little or no traffic delays (LOS A) during the afternoon peak hour. Drivers attempting turning movements from Haneoo Road onto Hana Highway will also experience little or no traffic delays (LOS A).

Proposed Project

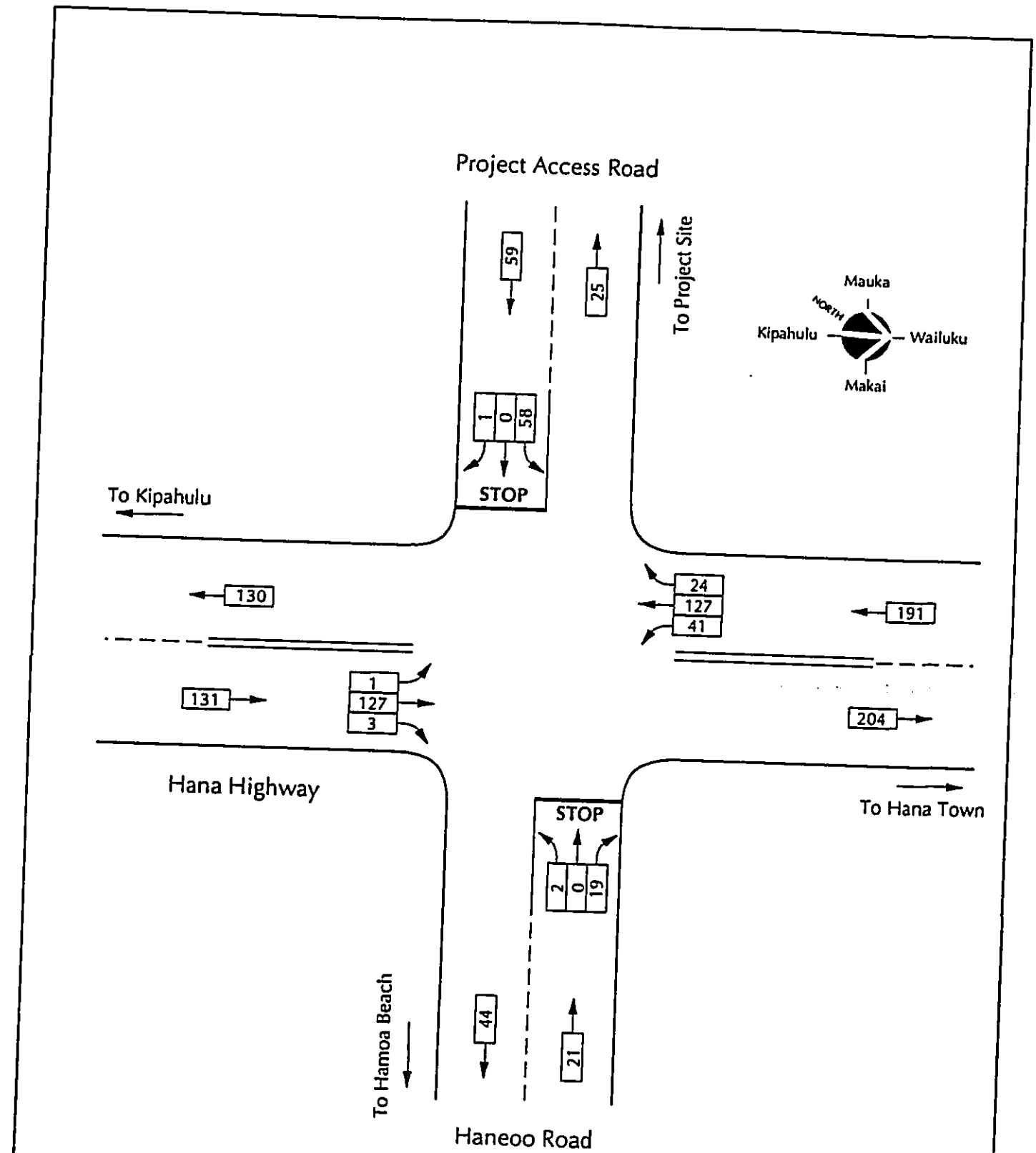
Future traffic with the project was forecast by adding traffic generated by the project to the forecasted traffic without the project. The number of vehicle trips generated by the project was estimated using data from the ITE Trip Generation Report. A new project Access Road would be constructed leading from the project site to the intersection of Hana Highway with Haneoo Road forming a new cross intersection. Table 8.4.3 shows the resulting trip generation for the project. The resulting afternoon peak hour forecast traffic volumes with the project in 1995 are shown by turning movements in Figure 8.4.3.

Table 8.4.3 Trip Generation for Hana Ranch Country Club

Land Use	Afternoon Peak Hour Enter	Exit
Hana Ranch Country Club	25	59

Source: Pacific Planning & Engineering, Inc.

It is anticipated that the trips generated by the project should be less than that estimated using the Trip Generation Report due to the expected use of hotel shuttle vans transporting hotel guests between the Hotel and golf course. The use of this shuttle service may reduce a total of about 15 to 20 trips.



PACIFIC PLANNING & ENGINEERING, INC.

Source: Pacific Planning & Engineering, Inc.

1995 FORECASTS WITH PROJECT AFTERNOON PEAK HOUR

Figure 8.4.3

The project is expected to have minimal impact on traffic flow at the intersection of Hana Highway with Haneoo Road/Project Access Road when the project is completed by 1995.

With the project in 1995, drivers attempting left-turns from Hana Highway into Haneoo Road or the new Project Access Road will experience little or no traffic delays (LOS A) during the afternoon peak hour. Drivers attempting turning movements from both Haneoo Road and the Project Access Road onto Hana Highway will also experience little or no traffic delays (LOS A). The use of hotel shuttle vans transporting users between the golf course and Hotel should further minimize the impact on traffic flow.

It is recommended that the intersection of Hana Highway with Haneoo Road/Project Access Road be improved to Maui County standards. This improvement will provide for safer operating conditions and smoother traffic flow. Minimum improvements recommended at the intersection of Hana Highway and Haneoo Road/Project Access Road are:

1. Provide adequate turning radius to accommodate school buses and vans.
2. Widen Haneoo Road to provide for a minimum two-lane, two-way roadway at the vicinity of the intersection.
3. Provide adequate sight distances in both directions along Hana Highway at the study intersection.

8.5 ELECTRICAL SYSTEMS

8.5.1 EXISTING CONDITIONS

Maui Electric Company (MEC) services Hana with a substation located near the intersection of Hana Highway and Uakea Road. Presently, the substation is operating below its capacity. The estimated capacity of the substation is approximately 1,500 kilowatts (kw), which is greater than the peak requirement of approximately 1,300 kw. The 1,300 kw demand is less than one percent of the total output required for the island of Maui.

MEC has plans to expand the capacity of the Hana substation to approximately 2,000 kw by the end of 1992, if funds are available. Discussions with MEC staff indicates that they would need approximately eight months to order the required equipment to upgrade the substation.

8.5.2 PROBABLE IMPACTS

No-Action Alternative

Under the No Action Alternative, the increase in housing units (about 40) required to serve the projected population of 2,040 by the year 1995 will result in increased demand for electrical power. This increase in electrical demand should be relatively minimal and not result in any impacts to MEC's operation, facilities, or ability to meet electrical demands.

Proposed Project

The total electrical demand for the project is estimated to be approximately 400 kw. If the project's 400 kw power requirement is added to the current peak demand of 1,300 kw, it would exceed the existing substation capacity by 200 kw. However, MEC's plans to increase the substation's capacity to 2,000 kw by 1992 would provide sufficient capacity to service the project. MEC intends to meet future additional demands for electrical power in the Hana district.

MEC staff primary concern was not associated with electric demand generated by clubhouse facilities, but with the start-up power requirements for the golf course's irrigation system. Due to the high electrical demand required for starting the irrigation system's motors to pump water, this peak demand for power may reduce electrical power serving other residences and facilities causing lights to dim.

Keola will investigate the feasibility of implementing the following types of mitigation measures to reduce the amount of power needed from Maui Electric: 1) installing a water turbine power generator; 2) designing the golf course to use gravity for pumping water; and 3) operating the golf course irrigation system during off-peak periods (ex. early morning) when the overall electrical demand requirements are lower.

8.6 POLICE PROTECTION SERVICES

8.6.1 EXISTING CONDITIONS

Police protection in the Hana district is provided by the Maui Police Department's Hana District (District III). This station is located next to the Hana County Building at the intersection of Uakea Road and Hana Highway. Presently, there are a total of seven officers serving this district including a lieutenant, sergeant, and five patrol officers along with administrative staff. This station has three fleet vehicles and one four-wheel drive vehicle.

There are one to three patrol officers on duty at any given time patrolling the Hana district. For the past five years they have provided services with the same number of vehicles and officers. They have requested an additional police officer position and may need another vehicle in the future.

The police staff indicated that crimes associated with tourist are primarily non-violent ones such as speeding. Tourist are mainly victims of crimes such as car thefts.

8.6.2 PROBABLE IMPACTS

No-Action Alternative

The small increase in population and tourist are expected to result in minimal changes to the level of criminal activities occurring in the Hana district and is expected to have minimal impacts on police protection services in the area.

Proposed Project

Up to 112 additional residents may be associated with the project and the slight increase in number of visitors is expected to result in minimal changes to the present level of criminal activities occurring in the Hana district. The police staff have also confirmed that they don't expect major problems resulting from the project. As a result, the project is expected to have minimal impacts on police protection services in the area.

8.7 FIRE PROTECTION SERVICES

8.7.1 EXISTING CONDITIONS

Fire protection services in the Hana district are provided by the Maui Fire Department which has a substation located next to the Hana County Building at the intersection of Hana Highway and Uakea Road. There is presently one full-time fire fighter stationed there who is assisted by approximately 25 volunteers. This fire fighter works five days a week, 24 hours a day. Weekends are covered by the volunteers who have an emergency plan when the full-time fire fighter is off-duty. These volunteers are primarily made up of County Public Works employees whom train two to three times a year. These individuals have been volunteering their services for over a decade because there wasn't a fire station located in Hana before.

The substation includes a garage for a recently obtained fire truck along with minimal living quarters for the full-time fire fighter. The fire truck can hold up to 700 gallons of water with a pump pressure of 12 to 50 gallons per minute, and is similar to the fire truck at the Makawao substation. There are plans to build a new fire station in Hana to replace the existing one.

The fire fighter indicated that there were about eight fires within the past five years. These fires were primarily associated with residences caused by carelessness of the homeowners. In the event of a fire, the fire fighter is called first, and the volunteers are then called to assist and are usually able to respond within five to ten minutes. If more men are needed, fire fighters are flown in by helicopter from the Kahului substation in about 15 minutes. In addition, the fire fighter assists in medical emergencies in the Hana district.

8.7.2 PROBABLE IMPACTS

No-Action Alternative

Under the No-Action Alternative, approximately 40 additional housing units related to the expected increase in population would increase the potential for residential fires. The location of these housing units, especially in isolated areas, could affect the Fire Department's ability to put out fires. However, given the small increase in housing units by 1995, there should be little impact to fire protection services in the area.

Proposed Project

The fire fighter indicated that golf course project would not impact the Fire Department's ability to provide fire protection services. His previous work experience at other fire stations on Maui have shown no problems with golf courses. Moreover, the clubhouse facilities will be designed in accordance with applicable fire codes and standards.

Up to 36 additional housing units may be associated with the project which would increase the potential for residential fires. However, given the small increase in housing units by 1995, there should be little impact to fire protection services in the area.

8.8 EDUCATIONAL FACILITIES

The main public school facility serving the Hana district is Hana High and Elementary School (Hana School) which is a State operated public school for students in grade levels K through 12, including Special Education. The school is situated on a 37 acre site located makai of Hana Highway between Hana Airport and Hana Town.

8.8.1 EXISTING CONDITIONS

Based upon 1991 enrollment figures[6], Hana School had a total of 419 students with 55 percent (229) enrolled in grades K - 6, 37 percent (156) in grades 7 - 12, and 8 percent (34) in Special Education (SPED). The results of a linear regression analysis based upon available enrollment data and discussion with Hana School personnel showed a steady increase in students over the years of approximately 2 percent per year.

The faculty consists of a total of 34 certified teachers, consisting of 11 elementary school, 21 high school (includes intermediate grade levels), and 2 SPED teachers. In addition, there are over 25 supporting staff for the school which includes seven Educational Assistants, and two part-time teachers who also serve as the Athletic Director and the Student Activities Coordinator. School personnel have indicated that the existing faculty is adequate for the current level of student enrollment, but additional security aides to monitor the school site is desired.

Hana School currently has 11 single story buildings (including the school cafeteria) and four portables. One portable was recently constructed and is used for preschool children who were relocated from the Hana Community Center. Other facilities include a library, and a recently constructed school gymnasium which is used for various school and community activities. Due to a shortage of school facilities, several classrooms presently need to be shared by teachers.

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6 Public and Private School Enrollment, September 11, 1991, Office of Business Services, Information Branch, State Department of Education, January 1992.

Discussions with school personnel have indicated that an additional 3.5 classrooms (1.5 for high school and 2 for elementary) would be needed to better meet present and future school enrollments. A new portable for students in grades 3 - 6 is planned for construction and is expected to be completed in January 1993.

8.8.2 PROBABLE IMPACTS

No-Action Alternative

Based upon the forecast population of 2,040 residents by the year 1995, the student enrollment at Hana School is expected to be about 443 students. School personnel indicate higher enrollments is anticipated next year due to a greater number of preschool children entering elementary school than high school students graduating. Consequently, increased student enrollments primarily in the elementary grade levels are expected to have some impact on faculty staffing requirements. School personnel indicated two additional full-time elementary school teachers (one each for grades K - 2 and 3 - 6) may be necessary to meet the anticipated demand.

Because increased enrollments may result in the need for additional teachers, additional classrooms would also be needed to avoid further sharing of classrooms by teachers. The planned construction of a new portable for students in grades 3 - 6 should help minimize impacts on facility requirements.

Proposed Project

The project may add up to 36 households which could increase Hana's population by up to 112 residents. Using these estimates, the potential increase in resident population may increase enrollments at Hana School by up to 25 students (15 elementary and 10 high school students). However, the number of additional students is expected to be considerably lower since Keola expects to fill many jobs created by the project with existing Hana residents that currently work outside of Hana or with single persons.

Consequently, the project is expected to have minimal impacts on Hana School because it will not result in the need for additional faculty or facilities above that needed under the No-Action Alternative. However, without additional facilities and faculty to meet anticipated increased enrollments, additional students resulting from the project would exacerbate existing problems. The present educational assistants would provide Hana School with some flexibility in accommodating increased enrollments for a particular grade level. In addition, Hana School personnel indicated that assistance could be obtained from the Hana community if needed.

The need for additional school facilities is a common concern of many schools. School construction, however, is a complex issue. Limited resources for capital improvements, and the inherent "lumpiness" of capital improvement projects, means that school facility construction will not smoothly correspond to the school's needs.[7] This situation is similarly applicable with additional school faculty to meet increased enrollments.

Consequently, efficient utilization of available resources and increased planning and coordination between the State and County are needed to help reduce facility problems. Keola will coordinate closely with Hana School to minimize crowding associated with the project. They will give early notification to Hana School administrators, for example, on the expected characteristics of golf course employees and families to enable the school to plan accordingly.

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7 Final Report of the Task Force on Educational Governance, State of Hawaii, March 1992.

8.9 HEALTH CARE FACILITIES

8.9.1 EXISTING CONDITIONS

The main public health care facility serving residents and visitors in the Hana district is the Hana Medical Center (HMC). HMC serves as a satellite medical care center to Maui Memorial Hospital (MMH). MMH is the sole provider of secondary care services to residents of Maui County while tertiary care needs are handled by referral to hospitals on Oahu.

HMC is a State facility located about two miles north of the project site near the Hana Police Station. In addition to the medical center, there are two other structures used as nurses quarters located on the site. This medical center receives managerial and fiscal support services from MMH. The hospital has one ambulance, and a daily medical staff consisting of six to eight people which includes one full-time physician, three nurses and an X-ray technician. A physician in private practice also works at the hospital on a part-time basis. A nurse remains on duty after 5:00 p.m. and the physician is available on-call 24 hours a day.

According to State Health Planning and Development Agency reports, HMC has four beds which are available for medical or surgical care.[8] The use of these beds for acute care services has been extremely low over the years with occupancy rates less than 1 percent between 1987 and 1990. In 1990, there were only two recorded admissions for the entire year which had an average length of stay (ALOS) of only 1 day.

However, based upon discussion with HMC's staff, the family practice center of the medical facility has patient visitation levels ranging from 25 to 60 patients day. Few tourists visit the center, however, those who do are usually day visitors to Hana requiring assistance for hiking-related accidents. In the event of emergencies, patients are stabilized at HMC before being flown to Honolulu or MMH via the Hawaii Air Ambulance Service. If needed, private airplanes are used.

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8 State of Hawaii Utilization of Inpatient Facilities by County, Quarterly Year to Date for Periods Ending December 31, 1990, State Health Planning and Development Agency, Department of Health, State of Hawaii, August 1991.

A strategic planning process initiated with the development of the Strategic Plan, Maui Memorial Hospital and Hana Medical Center, 1990 to 1995 (Strategic Plan) identified a number of significant issue areas relevant to HMC. The following issues were identified: 1) emergency care response for Hana; 2) limited number of physicians and other health care personnel; 3) facility and equipment deficiencies and renovation requirements; and 4) obstetric requirements.

Last year, approximately 10 acres of land located next to HMC was acquired from Keola for the State Department of Health. This parcel was acquired to provide sufficient space for the future expansion of HMC. No firm plans have been developed on the type of facilities and structures to be constructed at this time.

8.9.2 PROBABLE IMPACTS

No-Action Alternative

Presently, HMC is understaffed to service the current level of demand for family medical services which is discussed in the Strategic Plan. Using medical staff to population ratios, up to a total of three physicians and nine nurses may be presently needed to service Hana's resident population of approximately 2,000.[9] Consequently, the HMC's existing medical staff may need an additional physician and up to four or five additional nurses.

The projected increase in resident population to 2,040 by 1995 may contribute from one to two additional patient visitations a day primarily for family medical services at HMC. These additional daily visitations would have a minor impact on HMC resulting from increased demands placed upon their limited medical staff. Increased day visitors to Hana would not result in considerable changes to the level of medical services required at HMC based upon the existing low level of patient visitations. Due to the historically low occupancy level for medical or surgical care beds and short ALOS for patients, the increased resident population is not expected to cause major changes in the level of demand for these acute care services.

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9 Canter, Atkinson, and Leistritz, Impact of Growth, A Guide for Socio-Economic Impact Assessment and Planning, Lewis Publishers, Inc., Chelsea, Michigan, 1986.

Proposed Project

The project may add up to 36 households which would increase Hana's population by up to 112 residents. Based upon the present frequency of visitation by residents, the increased population may contribute one to two additional patient visitations a day primarily for family medical services. However, the probable increase in patient visitation is expected to be lower since Keola expects to fill many jobs created by the project with existing Hana residents that currently work outside of Hana or with single persons.

Consequently, the project is expected to have a minimal impact on HMC resulting from increased demands placed upon their limited medical staff. Due to the historically low occupancy level for medical or surgical care beds and short ALOS for patients, no major changes in the level of demand for these acute care services is expected.

Efficient utilization of available resources along with increased planning and coordination between the State and County will help minimize problems. The land recently acquired for the future expansion of the HMC will improve working conditions and facilities when improvements are constructed. Therefore, close communication between HMC and the State Department of Health would enable the timely construction of facilities and the addition of staff.

8.10 RECREATIONAL FACILITIES

Recreational facilities were assessed to determine the probable impacts resulting from the project. Impacts were evaluated based upon the expected changes associated with: 1) access to existing recreational facilities, and 2) use of recreational facilities.

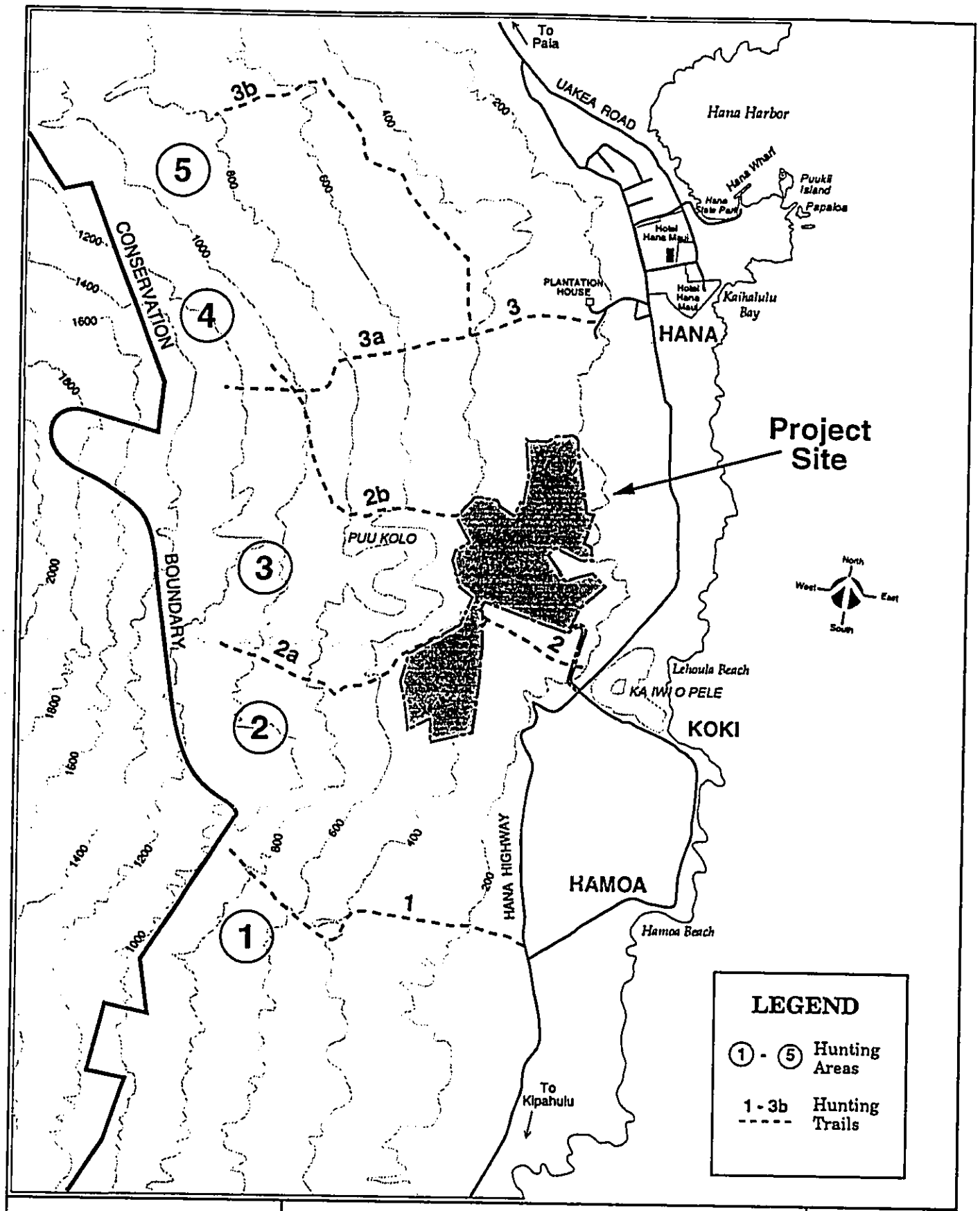
Hana's resident population was estimated to increase to 2,040 residents by 1995. Based on a regression analysis, the number of visitors to Seven Pools Park is expected to increase from 561,500 annual visitors in 1989 to 663,800 annual visitors in 1995. The project may add up to 36 households which would increase Hana's population by up to 112 residents.

8.10.1 HUNTING GROUNDS

There are five designated hunting grounds located within the immediate vicinity of the project site. As shown on Figure 8.10.1, these areas are generally located mauka of Puu Kolo Pahuolona and the project site on Keola lands. Hunting is permitted in these areas which extend up to the timberline located about a few hundred yards from the State Conservation District boundary. No hunting is permitted on Conservation land.

Access to these hunting grounds is provided by way of three primary trails from Hana Highway through Keola lands. As shown on Figure 8.10.1, two of the trails divide into separate trails creating a total of five trails. These trails generally follow existing paths used for Keola ranching operations or for access to existing water tanks.

Access and use of these hunting grounds are limited to Hana residents and their guests, and hunting is allowed only on the weekends. Discussions with Keola personnel indicate there are 30 Hana residents who have authorization to hunt in the five designated hunting areas. On the average, each hunter hunts about twice a year. Hunters usually go hunting in pairs because Keola encourages using the "buddy system" to prevent accidents. As a result, one pair of hunters usually go hunting each weekend. The five hunting grounds are fairly evenly used by hunters, however, the specific areas available for hunting on the weekend is dependent upon where the cattle is located at that time.



PACIFIC PLANNING & ENGINEERING, INC

Source: Keola Hana Maui, Inc.

Hunting Grounds and Existing Trails

Figure 8.10.1

8.10.1.1 Probable Impacts

No-Action Alternative

Under the No-Action Alternative, no impacts are expected to existing trails leading to the five hunting areas because the current land use would remain the same.

A ratio analysis comparing the current estimated resident population with hunters indicates an additional two hunters may result from the forecast increase in resident population (assuming Keola does not limit the number of hunters). The additional two hunters should not significantly change the existing hunting conditions of the five hunting areas.

Proposed Project

The proposed golf course will be located makai of Puu Kola Pahuolona and will cut off trail #2 which divides into two separate trails leading to hunting areas #2 to #4. As shown on Figure 8.10.1, access to hunting areas #2 and #4 could still be accessed through trails #1 and #3a, respectively, however, access to hunting area #3 would be difficult. Keola will continue to provide access to hunting area #3 for authorized residents, however, this route will be determined after completion of the final layout of the golf course.

The project may add up to 112 residents which could result in up to two additional hunters. These additional hunters, plus the additional two hunters under the No-Action Alternative, are not expected to significantly change existing hunting conditions.

8.10.2 BEACH PARKS AND FACILITIES

Beaches located within the immediate area of the proposed golf course site are Lehoula Beach, Koki Beach Park and Hamoa Beach as shown on Figure 8.10.2. Hana Beach Park is located at Hana Bay.

8.10.2.1 Existing Beach Facilities

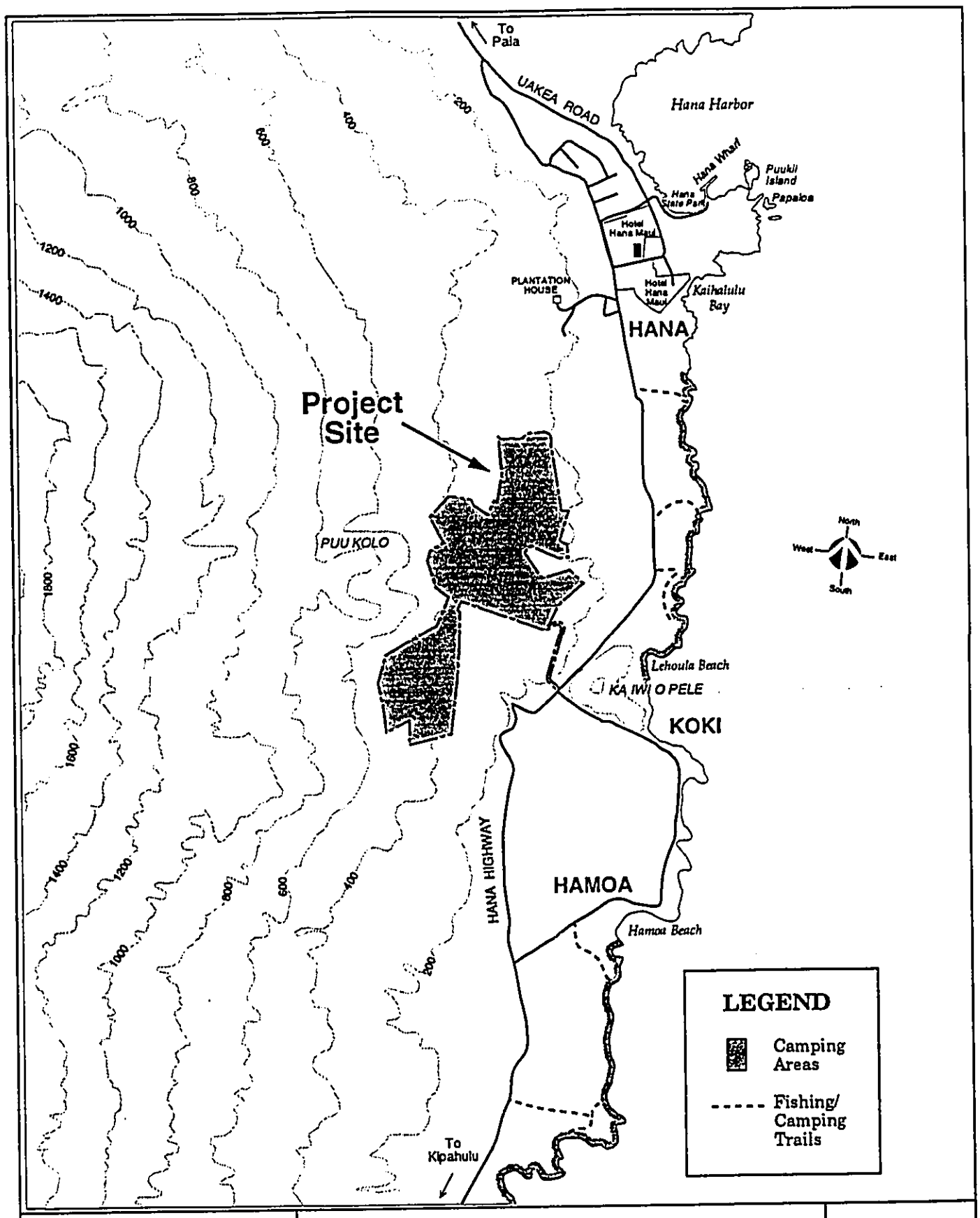
Lehoula Beach is privately owned by Keola and located on the north side of Puu Ka Iwi o Pele. This beach consists of a small flat pocket of white sand which is unprotected from the ocean, and subject to strong rip currents especially during high surf. As a result, generally no ocean recreational activities occur such as swimming or snorkeling. The Hotel Hana-Maui maintains private beach park facilities for its guest which include three pavilions with picnic tables and barbecue grills. There is no public access.

Koki Beach Park is a small grassy park located on the right side of Puu Ka Iwi o Pele. This beach consists of a flat pocket of white sand during the summer months, however, high surf claims most of the beach leaving only a narrow strip of sand during the winter months. Ocean recreational activities include surfing and bodysurfing, and limited swimming due to the relatively dangerous conditions. Public access is provided, and park facilities are limited to picnic tables and barbecue grills. Table 8.10.1 provides an estimated breakdown of beach park visitors and indicates usage by a large percentage of day-visitors to Hana.

Table 8.10.1. Estimated Average Daily Visitors to Beach Parks

	Weekday	Weekend
Koki Beach Park		
Hana Residents	12	24
Visitors (includes non-Hana Maui residents)	50	50
Total	62	74
Hamoa Beach Park		
Hana Residents	2	6
Visitors (includes non-Hana Maui residents)	2	2
Hotel Guests	30	30
Club Membership	4	10
Total	38	48

Source: Keola Hana Maui, Inc.



PACIFIC PLANNING ENGINEERING, INC

Source: Keola Hana Maui, Inc.

Coastal Recreation Facilities

Figure 8.10.2

Hamoa Beach is located at the head of Mokae Cove and consists of white sand stretching 1,000 feet long and 100 feet wide. This beach is unprotected from the ocean, and is a popular swimming, surfing and bodysurfing area. The access trail to the beach is owned by Keola, but public access is permitted. The use of beach facilities such as the pavilion and beach chairs are limited to guests of the Hotel Hana-Maui and individuals who have club memberships along with their guests. The Hotel also provides a lifeguard at Hamoa Beach. Based upon discussion with Keola staff, it is estimated that about 38 people visit this beach park on weekdays and 48 people on weekends. A breakdown of these visitors are shown on Table 8.10.1.

Hana Beach Park

Hana Beach Park is located on the shoreline of Hana Bay and is maintained by the County. The beach area is about 700 feet long and 100 feet wide, and is bordered by pilings of the old Hana Landing to the north and by the existing wharf to the south. The wharf located at the southern end of the park is a large T-shaped pier providing about 300 feet of berthing space for small crafts and commercial tugs and barges, however, the wharf is currently not used for interisland shipping.

Hana Beach is the safest beach in the district for swimming and people enjoy snorkeling in the bay. Existing facilities at Hana Beach Park include a boat ramp, pavilion, picnic tables, restrooms and showers. According to Maui County Parks and Recreation personnel, about 150 to 300 people per day use or visit Hana Beach Park during the weekdays. Of this total, 75 percent were estimated to be tourists, and 25 percent were residents (most of whom used the beach park for their lunch breaks). During the weekends, the 200 to 400 people per day visiting the beach park is comprised of 60 percent tourists and 40 percent residents.

The County Parks and Recreation personnel also indicated that there used to be a problem of congestion at the beach park due to many people using the pavilion and picnic tables for lunch, however, this problem no longer exists. The existing picnic tables can accommodate about 300 people.

Tour vans currently utilize Hana Beach Park to allow their passengers to have lunch, use restrooms, or take pictures and relax after the long drive to Hana. Currently, about eight tour vans stop by the beach park with about 50 percent of them allowing passengers to have lunch.

8.10.2.2 Probable Impacts

No-Action Alternative

Under the No-Action Alternative, the expected increase in resident population and daily visitors to Hana will result in more people using beach park facilities. Lehoula Beach is not open to the public, therefore, there should be no impact to this beach park's facilities resulting from increased residents and daily visitors.

An estimated 10 to 12 more people per day may visit Koki Beach Park during both weekdays and weekends by the year 1995. The majority of these people would probably be day-visitors to Hana. An estimated 5 more people per day may visit Hamoa Beach Park on weekdays and 5 to 10 more people per day on weekends by the year 1995. The majority of these people would probably be Hana residents especially on weekends. As shown on Table 8.10.2, an estimated 25 to 50 more people per day may use Hana Beach Park during weekdays and 30 to 65 more people per day during weekend.

Table 8.10.2. Recreational Activity at Hana Beach Park

	Weekday		Weekend	
Existing Estimated Daily Users	Low	High	Low	High
Residents	37	75	80	160
Day Visitors	113	225	120	240
Total	150	300	200	400
Additional Estimated Daily Users	Low	High	Low	High
Residents	5	10	10	20
Day Visitors	20	40	20	45
Total	25	50	30	65
Total Estimated Daily Users	175	350	230	465

Source: Pacific Planning & Engineering, Inc.

Using the minimum spatial standard derived for swimming and sunbathing activities on Maui (1 person per 100 square feet of area) from the 1990 State Recreation Functional Plan Technical Reference Document[10], the beach park's 70,000 square feet of beach area should be large enough to adequately accommodate the increased demand for swimming and sunbathing activities. Existing picnic facilities at Hana Beach Park should also be adequate in accommodating the increased demand since the total estimated number of daily users in the year 1995 would be spread out over the day.

10 This document describes spatial standards for recreational activities in Hawaii which are intended to serve as a framework in conducting capacity analyses.

Proposed Project

The project may add up to 112 residents, and contribute up to five more daily visitors on weekdays, and between five and ten more visitors on weekends to Hana Beach Park. This increase is expected to contribute to slightly more congestion at Hana Beach Park but result in minimal impacts. The projected increase in visitors to Koki Beach Park is expected to be less than five residents for both weekdays and weekends, and would also result in minimal impacts. Consequently, Hana Beach Park is expected to have adequate facilities and capacity to accommodate the projected increase in residents.

8.10.3 CAMPING AND FISHING RESOURCES

8.10.3.1 Existing Conditions

Shoreline fishing in the vicinity of the project is available along the Hana coastline, however, access to certain areas are limited because the lands are privately owned. Hana residents are able to obtain waivers from Keola allowing them access through Keola lands to fish along the shoreline.

Camping areas for residents are located along the coastline from Hana to Kakio. The general coastline areas available for camping which are accessible via trails from Hana highway are shown on Figure 8.10.2. The two most popular camping areas are located at Lehoula and Makaalae. Camping permits from Keola need to be obtained for residents planning to camp at Lehoula Beach or Makaalae Point. Discussions with Keola indicate that a total of approximately 20 people a day are either fishing or camping during weekdays, and 30 people a day during weekends.

8.10.3.2 Probable Impacts

No Action Alternative

Under the No-Action Alternative, the resident population is projected to increase to approximately 2,040 people by 1995. This increase in resident population should result in more people participating in camping or fishing activities along the coastline. Based upon the existing level of camping and fishing activities conducted at Lehoula Beach and Makaalae Point, an estimated one or two people more people would participate in activities at these locations. This minimal increase in use is not expected to have an impact on camping facilities at Lehoula Beach and Makaalae Point.

Proposed Project

The project is not expected to affect the ocean biota and resources as previously discussed in Sections 6.3 and 6.4. Consequently, fishing activities will also not be affected by the project.

The project may add up to 112 residents, which would add about one or two more people participating in activities at Lehoula Beach and Makaalae Point. This estimate was based upon the present level of participation by residents. This minimal increase in use is not expected to have an impact on camping facilities and fishing activities.

8.10.4 PUBLIC PARKS AND COMMUNITY FACILITIES

The major public parks and recreational facilities located in Hana are the Hana Community Center and Hana Ball Park.

8.10.4.1 Existing Conditions

Hana Community Center

The Hana Community Center is a County maintained community facility located in Hana town makai of the intersection of Uakea Road with Hauoli Road. This center has about ten different tenants using office space which are available on a permit basis. These tenants presently utilize the rooms for a variety of social, cultural, and recreational functions as activities.

The County Parks and Recreation Department indicated they do not have problems providing space to accommodate the needs of tenants and organizations. They presently have a few rooms not being utilized. When more space is needed, the offices are shared or dividers used to accommodate the tenants.

Hana Ball Park

Hana Ball Park is a County maintained park located at the intersection of Uakea Road and Hauoli Road on the mauka side of the Hana Community Center. This park is equipped with lighting and has facilities for baseball, softball, and soccer activities.

The County Parks and Recreation Department and field surveys conducted verify that Hana Ball Park is very actively utilized by Hana residents for a number of sports activities. The park is constantly used on weekdays and weekends during both days and nights. Some of the recreation programs conducted at Hana Ball Park are softball leagues, co-ed baseball, summer fun activities and Police Activity League (PAL) programs, Pee Wee League baseball, soccer activities, and Little League Baseball.[11]

The County staff are able to satisfactorily maintain park facilities and have adequate equipment. Staffing is presently adequate to meet maintenance requirements and has been for many years.

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11 County of Maui, Department of Parks and Recreation, Annual Report Fiscal Year 1989 - 1990.

Other Recreational Facilities

Other major public recreational facilities in Hana are the County's Hana Tennis Courts and Hana High and Elementary School gymnasium. The County's tennis courts consists of two fenced tennis courts equipped with lighting located next to Hana Ball Park. These courts are actively used by residents on weekends and weekdays usually at night. A recently completed gym located near the school's administration building is presently used for many indoor activities. The completion of this gym has helped alleviate the demand for indoor facilities and is actively used for various activities and leagues such as co-ed volleyball and basketball.

8.10.4.2 Probable Impacts

No Action Alternative

Under the No-Action Alternative, the projected increase in resident population to 2,040 by 1995 would result in a slight increase in the number of residents participating in various recreational activities. This increase in participation is not expected to result in a major change in the level of activities conducted or additional facility requirements.

Proposed Project

The project may add up to 112 residents, which would result in slightly more residents participating in recreational activities. However, due to the small number of additional participants, minimal or no impact to the level of activities conducted and facilities requirements is expected.

There is presently no golf course or driving range in the Hana district available for residents to play or practice. As a result, residents have to drive large distances to access golf courses making participation in the sport difficult. The project will provide residents with an additional recreational activity to participate in since the project will be open for public play with discounted rates for residents.

SECTION 9.0
RELATIONSHIP OF PROPOSED PROJECT TO PUBLIC PLANS, POLICIES AND CONTROLS

This Section discusses the relationship of the project to the objectives and policies of the Hawaii State Plan, the State Functional Plans, the Hawaii Coastal Zone Management Program, the General Plan of the County of Maui, and the Hana Community Plan.

9.1 HAWAII STATE PLAN

The Hawaii State Plan (State Plan), Chapter 226, Hawaii Revised Statutes (HRS) established a set of broad goals, objectives and policies that are to serve as long-range guidelines for the growth and development of the State. The following sections of the State Plan are directly applicable to the project.

Section 226-4 State Goals

(1) A strong, viable economy, characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawaii's present and future generations.

Discussion: The project will contribute to the attainment of these goals by creating both short and long-term employment opportunities for residents of Hana and Maui. Residents employed in construction, hotel and golf course jobs will be able to enjoy stable working conditions and incomes. The project will also generate State and County tax revenues which will contribute to economic stability, and government services to residents of Maui.

Section 226-5 Objectives and Policies for Population

Objective:

(a) 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.

Policies:

(b.2) Encourage an increase in economic activities and employment opportunities on the Neighbor Islands consistent with community needs and desires.

(b.3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

Discussion: The project will provide short and long-term employment opportunities for residents, and economic opportunities for businesses providing equipment, supplies and services for the Hotel, golf course and clubhouse.

Section 226-6 Objectives and Policies for the Economy - In General

Objectives:

(a.1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

(a.2) A steadily growing and diversified economic base that is not overly dependent on a few industries.

Policies:

(b.8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.

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

Discussion: As previously described, the project will provide the residents of Hana and Maui with short and long-term employment opportunities that would help contribute to upward mobility and family economic security.

In addition, the golf course jobs that involve working outdoors (e.g. groundskeepers, equipment operators, laborers, and maintenance personnel), would contribute to job satisfaction for some employees.

Section 226-8 Objectives and Policies for the Economy - Visitor Industry

Objective:

(a) Planning for the State's economy with regard to the visitor industry shall be directed towards achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.

Policies:

(b.1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.

(b.2) Ensure that visitor industry activities are in keeping with the social, economic and physical needs and aspirations of Hawaii's people.

(b.3) Improve the quality of existing visitor destination areas.

(b.4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.

(b.5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.

Discussion: The Hotel Hana-Maui is a prestigious luxury resort that has successfully served residents and visitors for many years. In the past few years, however, the Hotel has had difficulty in attracting its fair market share of visitors. The project will provide a basic resort amenity that many visitors are seeking, and should enable the Hotel to compete more effectively with other luxury resorts in Hawaii, and thereby increase and stabilize occupancy levels at the Hotel.

The project will be carefully designed and developed, and will be guided by extensive community participation.

Section 226-11 Objectives and Policies for the Physical Environment - Land-Based, Shoreline and Marine Resources

Objectives:

(a.1) Prudent use of Hawaii's land-based, shoreline, and marine resources.

(a.2) Effective protection of Hawaii's unique and fragile environmental resources.

Policies:

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

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

(b.5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.

(b.6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.

(b.8) Pursue compatible relationships among activities, facilities, and natural resources.

(b.9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational and scientific purposes.

Discussion: The project is being designed as a low intensity development with consideration of the natural features on the site and the maximum utilization of existing vegetation. The land and water resources of the project site will be properly managed, and no significant adverse environmental impacts are expected. No rare or endangered plant and animal species are located on the project site. Existing access to mountain and shoreline areas will be preserved, while providing a new recreational activity for residents.

Section 226-12 Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources

Objective:

(a) 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/historic resources.

Policies:

(b.1) Promote the preservation and restoration of significant natural and historic resources.

(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.

(b.4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.
(b.5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Discussion: The project area has been reviewed and surveyed, and a description of identified historic and archaeological sites is included in Section 6.9. Recommendations are included for the disposition of sites identified as significant for cultural, scientific or educational value. Implementation of the project will require the preparation of a Historic Sites Mitigation Plan to ensure its conformance with applicable State and County regulations concerning historic sites.

The natural beauty of Hana will be complemented by the the low density, open space character of the golf course. Scenic views and open space will be maintained and enhanced for the benefit of Hana residents. Moreover, the golf course is a more compatible land use with the existing surroundings than residential, industrial or commercial developments.

Section 226-13 Objectives and Policies for the Physical Environment - Land, Air, and Water Quality

Objective:
(a.1) Maintenance and pursuit of improved quality in Hawaii's land, air and water resources.

Policy:
(b.3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.

Discussion: The land and water resources of the project site will be properly managed. The golf course will be designed, constructed and operated to assure that land, air and water are not significantly affected by the project. Fertilizer and pesticide applications, for example, will be professionally managed and their usage kept to a minimum level. Computer simulation model results confirmed the project will not affect the quality of the groundwater, the streams and the ocean near the project site, as long as responsible turf management is practiced. Noise and air quality levels will be well within government standards.

Section 226-15 Objectives and Policies for Facility Systems - Solid and Liquid Wastes

Objective:
(a.2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.

Policy:
(b.1) Encourage the adequate development of sewerage facilities that complement planned growth.

Discussion: Keola will develop and maintain a packaged aerobic treatment plant and leaching field system to adequately treat the wastewater generated by the project without reliance upon existing County facilities.

Solid waste from the golf course including limbs, branches, cuttings, clippings, flowers and other plant materials will be disposed of in nearby Keola composting sites to minimize impacts to the Hana Landfill.

Section 226-23 Objectives and Policies for Socio-Cultural Advancement - Leisure

Objective:
(a) 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.

Policies:
(b.2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.
(b.4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.
(b.5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.

(b.6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.

Discussion: The project will preserve existing access to mountain and shoreline areas, while providing a new recreational activity for current and future residents. Several Hana residents have expressed interest in playing golf if the golf course is constructed.

Section 226-103 Economic Priority Guidelines

(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
(b) Priority guidelines to promote the economic health and quality of the visitor industry
(b.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 provide for adequate shoreline setbacks and beach access.
(b.3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.
(e.2) Encourage the improvement of irrigation technology and promote the use of non-potable water for agricultural and landscaping purposes.

Discussion: As previously described, the project will provide the residents of Hana and Maui with short and long-term employment opportunities. The golf course is a basic resort amenity that should enable the Hotel to compete more effectively with other luxury resorts in Hawaii, and thereby increase and stabilize occupancy levels at the Hotel. Only non-potable water will be used to irrigate the golf course and driving range.

Section 226-104 Population Growth and Land Resources Priority Guidelines

(b.2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.
(b.13) Protect and enhance Hawaii's shoreline, open spaces and scenic resources.

Discussion: An agricultural study conducted by Frank S. Scott, Jr., PhD determined that the 201 acres proposed to be converted from agriculture to golf course use would not have a significant negative impact on acreage needed for crop production and grazing on Maui.

The natural beauty of Hana will be complemented by the the low density, open space character of the golf course. Scenic views and open space will be maintained and enhanced for the benefit of Hana residents.

9.2 STATE FUNCTIONAL PLANS

The State Plan directs appropriate State agencies to prepare functional plans for their respective program areas. There are twelve State Functional Plans which serve as the primary implementing vehicle for the goals, objectives and policies of the State Plan. The major theme for these functional plans focuses on the promotion of a balanced growth approach in the use of the State's limited resources. This recognizes the need for economic development while preserving the environment and multi-cultural lifestyles throughout the State. The following State Functional Plans are directly applicable to the project.

9.2.1 STATE HISTORIC PRESERVATION FUNCTIONAL PLAN

The objectives, policies and implementing actions in the 1991 Historic Preservation Functional Plan are intended for implementation by the State Department of Land and Natural Resources and affiliated State agencies. The project area has been reviewed and surveyed, and a description of identified historic and archaeological sites is included in Section 6.9. Recommendations are included for the disposition of sites identified as significant for cultural, scientific or educational value. Implementation of the project will require the preparation of a Historic Sites Mitigation Plan to ensure its conformance with the applicable State and County regulations concerning historic sites.

9.2.2 STATE TOURISM FUNCTIONAL PLAN

The major objectives of the State Tourism Functional Plan reflect the need to find a balance among economic, social, and environmental issues.

Objective:

(II.A) Development and maintenance of well-designed visitor facilities and related developments which are sensitive to the environment, sensitive to neighboring communities and activities, and adequately serviced by infrastructure and support services.

Policies:
(II.A.1) Maintain high standards of overall quality of existing visitor destination and attraction areas.
(II.A.2) Enhance tourism product and encourage continued development of a diverse range of tourism products.

Discussion: As previously described, the golf course is a basic resort amenity that should enable the Hotel to compete more effectively with other luxury resorts in Hawaii, and thereby increase and stabilize occupancy levels at the Hotel.

The project will be carefully designed and developed, and will be guided by extensive community participation. The project is not expected to cause significant adverse environmental impacts, nor burden County and State facilities and services.

9.2.3 STATE AGRICULTURAL FUNCTIONAL PLAN

The mission of the 1991 State Agricultural Functional Plan is to "increase the overall level of agricultural development in Hawaii, in accordance with the two fundamental Hawaii State Plan objectives for agriculture: continued viability in Hawaii's sugar and pineapple industries, and continued growth and development of diversified agriculture throughout the State."

Objectives:
(G) Achievement of effective protection and improved quality of Hawaii's land water, and air.
(H) Achievement of productive agricultural use of lands most suitable and needed for agriculture.

Policies:
(G1) Ensure the effective, efficient, and safe use of pesticides, and minimize their possible adverse impacts on the public and the environment.
(H2) Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

Discussion: As previously described, the golf course will be designed, constructed and operated to assure that land, air and water are not significantly affected by the project. Fertilizer and pesticide applications, for example, will be professionally managed and their usage kept to a minimum level. Computer simulation model results confirmed the project will not affect the quality of the groundwater, the streams and the ocean near the project site, as long as responsible turf management is practiced. Noise and air quality levels will be well within government standards.

An agricultural study determined the project would not have a significant negative impact on acreage needed for crop production and grazing on Maui.

9.2.4 STATE RECREATION FUNCTIONAL PLAN

The 1991 State Recreation Functional Plan is divided into six issue areas: ocean and shoreline recreation; mauka, urban, and other recreation opportunities; public access to the shoreline and mauka recreation areas; resource conservation and management; management of recreation programs, facilities, and areas; and wetlands protection and management.

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

Policy:
(111.A.1) Require land use permit applications to fully address the impact of their projects on trails and public access.

Discussion: There are five designated hunting grounds located within the immediate vicinity of the project site. The project would affect access to one of the hunting areas, however, Keola will provide an alternate access route to the hunting area for authorized residents. Current access to shoreline areas will not be affected by the project.

9.2.5 STATE HOUSING FUNCTIONAL PLAN

The overall goal of the 1989 State Housing Functional Plan is to give every Hawaii resident "the opportunity to live in a safe, decent and affordable home."

Objectives:
(A) Homeownership for at least sixty percent, or roughly 248,500 households by the year 2000.
(B) Sufficient amount of affordable rental housing units by the year 2000 so as to increase the State's rental vacancy rate to at least 3 %.

Policies:
(A.3) Ensure that (1) housing projects and (2) projects which impact housing provide a fair share/adequate amount of affordable homeownership opportunities.
(B.3) Ensure that projects which impact housing provide affordable rental opportunities for employees.

Discussion: Keola is currently assisting the Hana Affordable Housing and Community Development Corporation in attempting to develop three housing projects: single family units, multi-family rentals, and elderly housing. To the extent these efforts are successful, they would help alleviate existing housing problems and provide housing for new employees of the golf course.

9.2.6 STATE HEALTH FUNCTIONAL PLAN

The 1989 State Health Functional Plan identifies four major priority issue areas on which the plan focuses. These issue areas are: (1) preventive health; (2) access to health care; (3) environmental protection; and (4) internal administrative issues. Of these four, access to health care and the environmental protection issue are the most relevant to the project.

The project is expected to have very little or no effect on health care facilities or services. The golf course will be design and constructed in compliance with applicable State Department of Health (DOH) environmental rules and regulations as well as those established by Federal and County agencies. In addition, applicable DOH permit/approval requirements will be obtained and complied with.

9.2.7 STATE HUMAN SERVICES FUNCTIONAL PLAN

The 1989 State Human Services Functional Plan identifies elderly care, children and family support, self-sufficiency, and service delivery improvements as priority issues.

The project supports the Human Services Functional Plan by assisting individuals and families in achieving economic self-sufficiency through increased employment opportunities.

9.2.8 STATE EMPLOYMENT FUNCTIONAL PLAN

The 1989 State Employment Functional Plan lists the following major objectives: (1) improve the qualifications of entry-level workers and their transition to employment; (2) develop and deliver education, training and related services to ensure and maintain a quality and competitive workforce; (3) improve labor exchange; (4) improve the quality of life for workers and families; and (5) improve planning of economic development, employment and training activities.

The project is generally in concert with these objectives by providing increased local employment opportunities and contributing to improving the quality of life for workers and families.

9.3 HAWAII COASTAL ZONE MANAGEMENT ACT

The objectives of the Hawaii Coastal Zone Management (CZM) Program outlined in Chapter 205-A, Hawaii Revised Statues, are to protect and maintain valuable coastal resources. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities proposed within the coastal zone.

The entire project site is located outside of the County's Special Management Area. The project conforms to and supports the Hawaii CZM Program's objectives by not affecting access to the shoreline and not adversely impacting nearby coastal resources.

As previously described, computer simulation model results confirmed the project will not affect the quality of the groundwater, the streams and the ocean near the project site, as long as responsible turf management is practiced. A marine resource assessment also determined the project will not adversely affect marine resources in Hana.

9.4 OFFICE OF STATE PLANNING

9.4.1 GOLF COURSE DEVELOPMENT IN HAWAII: IMPACTS AND POLICY RECOMMENDATIONS

In response to a Senate Concurrent Resolution, the Office of State Planning (OSP) studied the cumulative environmental, social, and economic impacts of golf course development in Hawaii. Their findings and recommendations were included in their report entitled Golf Course Development in Hawaii: Impacts and Policy Recommendations, dated January, 1992. The following recommendations of this report are directly applicable to and supported by the project.

Land use:
Golf course developments should not be a permissible use in the Agricultural District, except in counties with populations below 200,000, by special permit in exceptional situations. ....Exceptions should be made, however, to allow golf courses with low intensity uses in the Agricultural District in the Neighbor Islands through the special use permit.

Discussion: The project will be a low intensity use in the Agricultural District on Maui. The County of Maui's de facto population in 1990 was 139,300. The project site is located on marginal agricultural land. Based on Soil Conservation Service land capability classifications, 51 percent of the project soils are marginal for crop production and 49 percent are not adaptable to cultivated crop production. The Land Study Bureau classified 71 percent in the marginal category and 29 percent as not adaptable.

The golf course would be a low intensity use. The total annual golf rounds is projected to be approximately 23,600 rounds which is significantly lower than more accessible golf courses.

The project does not include additional development nor further urbanization. There are no plans to increase the number of guestrooms or cottages at the Hotel Hana-Maui, nor to construct luxury homes or condominiums around the golf course.

Physical resources:
Do not allow golf course construction in sensitive sites.

Discussion: The slope of the project site is less than 12 percent. The project site does not include rare and endangered flora or fauna, nor intact native forests. The project site is situated within the Kawaipapa Aquifer System, however, Section 6.3.2 clearly states the project's effects on ground and surface waters will be well within water quality standards. Keola will fully comply with the State Department of Health's 12 conditions applicable to new golf course developments, including the establishment of baseline ground water data and the implementation of an approved ground water monitoring plan and system.

Other conditions:
Erosion control plans. Permanent buffers between golf courses and streams, wetlands, and coastal waters. Continued preservation of significant archaeological sites. Monitoring air quality for airborne chemicals or sewage effluent. Tangible benefits to the community.

Discussion: Section 6.10.3 discusses erosion control measures. In the grading of the fairways, the amount of cut and fill will be balanced. All exposed slopes and areas will be grassed immediately after grading to control and mitigate soil erosion. Other temporary erosion control measures, such as erosion control berms, will be utilized during construction.

The drainage system within the project will generally maintain the natural drainage pattern in the area. No increase in runoff or sedimentation in the coastal waters is expected from the project site. Impacts on water quality of the receiving waters for area runoff will be prevented or minimized by strict adherence to the types of temporary and permanent erosion control measures listed above or as specified by the Maui Department of Public Works.

None of the streams in the project site are listed as streams with important aquatic resources (i.e., native fauna and habitat) in the 1990 Hawaii Stream Assessment report by the Commission on Water Resource Management. There are no wetlands in or adjacent to the project site. The project site is located outside of the County's Special Management Area, more than 1.500 feet from the shoreline.

Keola is committed to incorporating the archaeological and historical sites located in the golf course project area into the project whenever possible, and will continue to work closely with the Hana Community and the applicable government agencies to achieve this objective. A data recovery plan and detailed preservation plan will be developed for the review and approval of the State Historic Preservation Division and the Maui Planning Department.

The application of fertilizers and pesticides are not expected to affect air quality. Sewage effluent will not be used to irrigate the golf course and, therefore, will not affect air quality.

The golf course will provide a new recreational activity for the community. The golf course, driving range and clubhouse will be open to the public and its meeting rooms made available for the community's use. Kamaaina golf rates will be offered to Hawaii residents.

Keola has provided assistance to the Hana Affordable Housing and Community Development Corporation in the form of start-up, training, orientation, studies, surveys, workshops, legal and consultant fees, travel, inspection tours, clerical support, technical resources and funding. They have previously committed a donation of 15 acres of land for a single-family affordable housing project. In addition, Keola will provide further direct support (i.e., land, funding, or in-kind services) to mitigate the housing needs of the project.

Section 6.3.2 states the project's effects on ground and surface waters will be well within water quality standards and, therefore, will not affect cultural and recreational activities such as fishing and food gathering activities. The project will affect access to one of the hunting areas, however, Keola will provide an alternate access route to the hunting area for authorized residents. Current access to shoreline areas will not be affected by the project.

9.4.2 STATE LAND USE DISTRICT BOUNDARY REVIEW (DRAFT)

In January, 1992, OSP issued a second report entitled State Land Use Boundary Review for Maui County. The purpose of the Five-Year Boundary Review is to conduct a statewide, comprehensive, policy-oriented examination of State land use district classifications. Based on the technical studies and evaluations conducted, the only recommendation applicable to the project is the change for the Kapia Stream from Agriculture to Conservation.

The area of Kapia Stream proposed for conservation designation extends from the present Conservation boundary near the forest reserve makai (east) toward the ocean. This area includes the stream itself along with a 100 foot corridor on both sides measured from the stream bank. Figure 56 of this report shows the area along Kapia Stream recommended for Conservation designation.

Discussion: Kapia Stream is located over a half mile south of the project site. Consequently, the project would not conflict with the recommended change in land use designation to Conservation. Furthermore, drainage patterns resulting from the project along with golf course activity and clubhouse operations are not expected to affect the present water quality or stream biota resulting in no environmental impact to Kapia Stream.

9.5 COUNTY OF MAUI

9.5.1 GENERAL PLAN OF THE COUNTY OF MAUI

The Maui County Charter requires the General Plan of the County of Maui, 1990 Update, (General Plan) to "...recognize and state the major problems and opportunities concerning the needs and the development of the county and the social, economic and environmental effects of such development and shall set forth the desired sequence, patterns and characteristics of future development."

The General Plan identifies the following five major themes: (1) Protect Maui County's agricultural land and rural identity; (2) Prepare a directed and managed growth plan; (3) Protect Maui County's shoreline and limit visitor industry growth; (4) Maintain a viable economy that offers diverse employment opportunities for residents; (5) Provide for needed resident housing. The following General Plan objectives and policies are directly applicable to the project.

Objective:
(I.A.1) To plan the growth of resident and visitor population through a directed and managed growth plan so as to avoid social, economic and environmental disruptions.

Policies:
(1.b) Balance population growth by achieving concurrency between the resident employee work force, the job inventory created by new industries, affordable resident/employee housing, constraints on the environment and its natural resources, public and private infrastructure, and essential social services such as schools, hospitals, etc.
(1.c) Maintain a balance between resident and visitor population by controlling and regulating growth of visitor facilities.
(1.d) Provide for population density and distribution patterns within the appropriate community plans which balance with the County's fiscal ability to provide necessary essential services.

Discussion: The number of guest rooms at the Hotel Hana-Maui will not be increased, nor will luxury home be constructed around the golf course. Therefore, the only population impacts of the project would be the potential in-migration of new residents due to the project. The potential in-migration of up to 112 persons would be within the Hana Community Plan's population guidelines for the year 2000.

The project is not expected to burden County and State facilities and services.

Objectives:

(I.B.1) To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in accordance with the individual character of the various communities and regions of the County.

(I.B.3) To preserve lands that are well suited for agricultural pursuits.

Policies:

(1.c) Identify and preserve significant historic and cultural sites.

(3.d) Discourage the conversion, through zoning or other means, of productive or potentially productive agricultural lands to non-agricultural uses, including but not limited to golf courses and residential subdivisions.

Discussion: Significant historic and cultural sites have been identified in Section 6.9, and an appropriate mitigation plan will be developed to ensure conformance with the applicable State and County requirements.

An agricultural study conducted by Frank S. Scott, Jr., PhD determined that the 201 acres proposed to be converted from agriculture to golf course use would not have a significant negative impact on acreage needed for crop production and grazing on Maui.

Objectives:
(I.C.1) To preserve and protect the County's unique and fragile environmental resources.
(I.C.2) To use the County's land-based physical and ocean-related coastal resources in a manner consistent with sound environmental planning practice.

Policies:
(1.b) Preserve scenic vistas and natural features.
(2.a) Preserve, enhance and establish traditional and new environmentally sensitive access opportunities for mountain and ocean resources.
(2.b) Evaluate all land based development relative to its impact on the County's land and ocean ecological resources.

Discussion: The natural beauty of Hana will be complemented by the the low density, open space character of the golf course. Scenic views and open space will be maintained and enhanced for the benefit of Hana residents. Moreover, the golf course is a more compatible land use with the existing surroundings than residential, industrial or commercial developments.

There are five designated hunting grounds located within the immediate vicinity of the project site. The project would affect access to one of the hunting areas, however, Keola will provide an alternate access route to the hunting area for authorized residents. Current access to shoreline areas will not be affected by the project.

The golf course will be designed, constructed and operated to assure that land, air and water are not significantly affected by the project. Fertilizer and pesticide applications, for example, will be professionally managed and their usage kept to a minimum level. Computer simulation model results confirmed the project will not affect the quality of the groundwater, the streams and the ocean near the project site, as long as responsible turf management is practiced. Noise and air quality levels will be well within government standards.

Objective:
(I.D.1) To preserve for present and future generations the opportunity to know and experience the arts, culture and history of Maui County.

Policies:
(1.b) Encourage the recordation and preservation of all cultural and historic resources, to include culturally significant natural resources.
(1.e) Identify and maintain an inventory of significant and unique cultural resources for special protection.

Discussion: As previously described, significant historic and cultural sites have been identified in Section 6.9, and an appropriate mitigation plan will be developed to ensure conformance with the applicable State and County requirements.

Objectives:
(II.A.1) To provide an economic climate which will encourage controlled expansion and diversification of the County's economic base.
(II.A.2) To provide a balance between visitor industry employment and non-visitor employment for a broader range of employment choices for the County's residents.
(II.A.3) Utilize an equitable growth management program which will guide the economic-well-being of the community.

Policies:
(1.a) Maintain a diversified economic environment compatible with acceptable and consistent employment.
(2.a) Encourage industries that will utilize the human resources available from within Maui County rather than having to import workers.
(3.a) Encourage a sustainable rate of economic development which is linked to the carrying capacity of the infrastructure systems and the fiscal ability of the County to maintain those systems.

Discussion: The project will create both short and long-term employment opportunities for residents of Hana and Maui. Residents employed in construction, Hotel and golf course jobs will be able to enjoy stable working conditions and incomes.

The project will also generate State and County tax revenues which will contribute to economic stability, and government services to residents of Maui, but is not expected to burden County and State facilities and services.

Objectives:
(II.B.1) To encourage exceptional and continuing quality in the development of visitor industry facilities.
(II.B.2) To control the development of visitor facilities so that it does not infringe upon the traditional social, economic and environmental values of our community.

Policies:
(1.e) Encourage enhancement of existing visitor facilities without substantial increases in room count.
(1.f) Encourage the use of local manpower in the construction of visitor facilities, and the use of local manpower at facilities at all employment levels including management in the operation of those facilities.
(1.g) Locate building so as to retain scenic vistas.

Discussion: The project fully supports these objectives and policies by enhancing the Hotel Hana-Maui with a basic resort amenity (i.e., golf course) that many visitors are seeking, and not increasing the number of Hotel guest rooms nor constructing luxury homes around the golf course.

The Hotel Hana-Maui is a prestigious luxury resort that has successfully served residents and visitors for many years. In the past few years, however, the Hotel has had difficulty in attracting its fair market share of visitors. The project should enable the Hotel to compete more effectively with other luxury resorts in Hawaii, and thereby increase and stabilize occupancy levels at the Hotel.

As previously described, the project will create both short and long-term employment opportunities for residents of Hana and Maui.

The clubhouse is being designed and located to minimize visual impacts and to retain scenic vistas. The clubhouse will only be visible along a short section of Hana Highway near Haneoo Road because the sloping and hilly terrain of the project site provides a natural visual buffer. The clubhouse will also create new views of Puu Ka Iwi o Pele and the coastline for residents and visitors which are currently not available.

Objective:
(II.C.2) To maximize the use and yield of productive agricultural land throughout the County.

Policy:
(2.a) Ensure the availability of land that is well suited for agricultural production.

Discussion: As previously described, an agricultural study determined the project would not have a significant negative impact on acreage needed for crop production and grazing on Maui.

Objectives:
(III.A.1) To provide a choice of attractive, sanitary and affordable homes for all our residents.
(III.A.2) Provide affordable housing to be fulfilled by a broad cross-section of housing types.

Policies:
(1.f) Encourage large land owners in the context of new projects to provide land and/or housing for their employees.
(2.b) Support the establishment of a non-profit County, business and community based housing alliance to provide financial assistance for housing development, purchase and rental.

Discussion: Keola is currently assisting the Hana Affordable Housing and Community Development Corporation in attempting to develop three housing projects: single family units, multi-family rentals, and elderly housing. To the extent these efforts are successful, they would help alleviate existing housing problems and provide housing for new employees of the golf course.

Objective:
(IV.B.2) To make more efficient use of our ground, surface and recycled water sources.

Policy:
(2.h) Support the establishment of potable groundwater use priorities which prohibit the use of potable water for the irrigation of golf courses, golf driving ranges, parks and landscaped open space.

Discussion: Only non-potable water will be used to irrigate the golf course and driving range. Further, the project will not impact Keola's and the County's potable water systems.

Objective:
(IV.C.1) To provide efficient, safe and environmentally sound systems for the disposal and reuse of liquid and solid wastes.

Policy:
(1.a) Explore new waste disposal methods that are safe, economical, environmentally sound, and aesthetically pleasing, and that minimize the disposal of wastes in landfills.

Discussion: Keola will develop and maintain a packaged aerobic treatment plant and leaching field system to adequately treat the wastewater generated by the project without reliance upon existing County facilities.

Solid waste from the golf course including limbs, branches, cuttings, clippings, flowers and other plant materials will be disposed of in nearby Keola composting sites to minimize impacts to the Hana Landfill.

Objectives:
(V.B.1) To provide high-quality recreational facilities to meet the present and future needs of our residents of all ages and physical ability.
(V.B.2) To provide a wide range of recreational, cultural and traditional opportunities for all our people.

Policies:
(1.d) Develop facilities that will meet the different recreational needs of the various communities.
(2.e) Encourage the identification, restoration, and preservation of important archaeological, historical and cultural sites.

Discussion: The project will provide a new recreational activity for current and future residents. Several Hana residents have expressed interest in playing golf if the golf course is constructed.

As previously described, significant historic and cultural sites have been identified in Section 6.9, and an appropriate mitigation plan will be developed to ensure conformance with the applicable State and County requirements.

9.5.2 HANA COMMUNITY PLAN

The Hana Community Plan adopted in June, 1980, is currently being updated. The purpose of the Hana Community Plan is to provide a relatively detailed scheme for implementing the County's General Plan's broad objectives and polices relative to the Hana region. The following policies of the current Hana Community Plan are directly related to the project.

Policy:
(A.1.a) Maintain agriculture and ranching as major economic activities, with special emphasis on promoting diversified agriculture, such as aquaculture and horticulture.

Discussion: The project area has been used as cattle ranching and pasture lands for more than 47 years. The pasture lands that will be used for the project will be replaced by reclaiming brush lands resulting in relatively minor impacts to ranching activities.

An agricultural study determined the project would not have a significant negative impact on acreage needed for crop production and grazing on Maui.

Policy:
(A.1.b) Maintain the visitor industry as a major economic activity.

Discussion: The project will help the Hotel Hana-Maui continue as a major economic activity in Hana. The Hotel is a prestigious luxury resort that has successfully served residents and visitors for many years. In the past few years, however, the Hotel has had difficulty in attracting its fair market share of visitors. The project will provide a basic resort amenity that many visitors are seeking, and should enable the Hotel to compete more effectively with other luxury resorts in Hawaii, and thereby increase and stabilize occupancy levels at the Hotel.

Policy:
(A.2.a) Use a projected resident population of 2,300 over the next 20 years as a guideline for planning county policies and services.

Discussion: The potential in-migration of new employees associated with the project will be within the projected resident population goal of 2,300 established in the Plan.

Policy:
(D.1.e) Recognize the importance of historically and archaeologically sensitive sites and encourage their preservation through development project review. Require development projects to identify all cultural resources located within the project area as part of the initial project studies. Further require that all proposed activity include recommendations to mitigate potential adverse impacts on cultural resources.

Discussion: Significant historic and cultural sites have been identified in Section 6.9, and an appropriate mitigation plan will be developed to ensure conformance with the applicable State and County requirements.

Policy:
(D.4.d) Encourage public sector projects, government programs, public-private joint efforts, and other assistance programs to reduce costs and increase housing availability for all income groups.

Discussion: Keola is currently assisting the Hana Affordable Housing and Community Development Corporation in attempting to develop three housing projects: single family units, multi-family rentals, and elderly housing. To the extent these efforts are successful, they would help alleviate existing housing problems and provide housing for new employees of the golf course.

SECTION 10.0
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The development of the Hana Ranch Country Club would result in the irreversible and irretrievable commitment of certain natural and fiscal resources. Major resource commitments include the land on which the project is located and on which facilities would be constructed, as well as money, construction materials, manpower and energy. The impacts of using these resources should be weighed against the expected positive socioeconomic benefits to be derived from the project versus the consequences of taking no action.

The commitment of resources required to accomplish the project includes building materials and labor, both of which are generally non-renewable and irretrievable. Construction of and resultant travel to and from the project by residents and visitors would require the consumption of petroleum products and petroleum based electrical generation which are also irretrievable commitment of resources.

SECTION 11.0
RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

No short-term use of resources that will have negative long-term consequences have been identified. The project will be designed and constructed to be of high quality, visually appealing, and to last for decades. The principal long-term benefits of the project are the economic stability and benefits provided by the improved Hotel-Hana Maui occupancy levels and Hotel and golf course employment, the project's low level and open space character, and the availability of a new and attractive recreational activity. The project is a basic resort amenity required in today's competitive primary luxury resort market and is a logical extension of the Hotel.

SECTION 12.0
SUMMARY OF UNRESOLVED ISSUES

During this EIS process, Keola has been working closely with the Hana community and government agencies to assure their concerns and ideas are incorporated into the design of the project to the extent possible. Keola has held meetings with the Hana Negotiations Committee and Community Association to discuss their concerns, and has made themselves available to the community to discuss any questions or concerns the may have associated with the project during this process. Major issues and concerns expressed have been addressed and discussed in the Final EIS. Consequently, there are no unresolved issues presently identifiable at this time.

Keola has and will continue to work with the Hana community. However, should any issues arise, Keola will attempt to resolve them as they have done on previous occassions. This would include discussions with the community or government agencies to clarify concerns and issues along with potential solutions that are agreeable to both parties to the extent possible.

SECTION 13.0
PARTIES CONSULTED AND PARTICIPANTS IN THE EIS PREPARATION PROCESS

13.1 DRAFT EIS PREPARATION

The following organizations and individuals were sent the EIS Preparation Notice filed with the Office of Environmental Quality Control on January 15, 1992. Correspondence with those organizations and individuals submitting comments are presented in Appendix A. The issues and concerns raised in the comment letters have been considered and addressed in various sections of the Draft EIS.

• = submitted a letter of "no comment"
* = no response

Federal Agencies

*U. S. Department of the Interior - Fish and Wildlife Service
U. S. Department of Agriculture - Soil Conservation Service
*U. S. Department of the Interior - Geological Survey, Water Resources Division
U. S. Army Corps of Engineers

State Agencies

•Department of Accounting and General Services - Public Works
Department of Agriculture
*Department of Business, Economic Development and Tourism
Department of Education
*Department of Hawaiian Home Lands
Department of Health
Department of Human Services
Department of Land and Natural Resources
•Department of Public Works
Department of Transportation
Housing Finance and Development Corporation
*Office of Environmental Quality Control

State Agencies (continued)

*Office of Hawaiian Affairs
*Office of State Planning
State Land Use Commission
*University of Hawaii Environmental Center

County Of Maui

*The Honorable Linda Crockett Lingle, Mayor
*Maui County Council
*Department of Human Concerns
*Department of Parks and Recreation
*Department of Planning
Department of Public Works
*Department of Water Supply
*Fire Department
*Police Department

Individuals and Organizations

*American Lung Association
*Lillian and Charles J. Boerner
John Bose, II
Alistair Couper
*Cheryl Duke
Friends of the Hana Coast
*GTE Hawaiian Tel
Lisa Hamilton
Hana Community Association
Hana Community Negotiations Committee
*Hawaii Audubon Society
Carl R. Honig, M. D.
*Samuel Ka'eo
Kalepa Farm Botanical Preserve
*Ka Pilina O Hana
Francis J. M. Kennedy
*Judy Kinser
*Maui Electric Co. Ltd.

Individuals and Organizations (continued)

*Mickael Om Mast
Native Hawaiian Advisory Council
*Native Hawaiian Legal Corporation
*Pat O' Connell
*Caroline Smith
J. T. Scott
*Sierra Club, Maui Group
*The Hawai'i'-La'ieikawai Association, Inc.
*Rich Von Wellsheim
*Elaine S. Wender

13.2 FINAL EIS PREPARATION

The following organizations and individuals were sent the Draft EIS filed with the Office of Environmental Quality Control and published in the August 23, 1992 OEQC Bulletin. Correspondence with those organizations and individuals submitting comments are also presented in Appendix A. The issues and concerns raised in the comment letters have been considered and addressed in various sections of the Final EIS.

• = submitted a letter of "no comment"
* = no response

Federal Agencies

*U. S. Department of the Interior - Fish and Wildlife Service
•U. S. Department of Agriculture - Soil Conservation Service
•U. S. Department of the Interior - Geological Survey, Water Resources Division
*U. S. Army Corps of Engineers
•U. S. Department of the Navy

State Agencies

•Department of Accounting and General Services - Public Works
Department of Agriculture

State Agencies (continued)

•Department of Business, Economic Development and Tourism
Department of Defense - Civil Defense
Department of Education
Department of Hawaiian Home Lands
Department of Health
•Department of Human Services
Department of Land and Natural Resources
Department of Land and Natural Resources-Historic Preservation
Department of Transportation
Housing Finance and Development Corporation
Office of Environmental Quality Control
Office of Hawaiian Affairs
Office of State Planning
State Land Use Commission
University of Hawaii Environmental Center

County Of Maui

*The Honorable Linda Crockett Lingle, Mayor
*Maui County Council
Department of Human Concerns
*Department of Parks and Recreation
Department of Planning
•Department of Public Works
Department of Water Supply
*Fire Department
*Police Department

Individuals and Organizations

*American Lung Association
*Lillian and Charles J. Boerner
*John Bose, II
*Alistair Couper
Cheryl Duke
Friends of the Hana Coast
*GTE Hawaiian Tel

Individuals and Organizations (continued)

Lisa Hamilton
Hana Community Association
Hana Community Negotiations Committee
Hana High and Elementary School PTSA
*Hawaii Audubon Society
*Carl R. Honig, M. D.
*Samuel Ka'eo
*Kalepa Farm Botanical Preserve
*Ka Pilina O Hana
*Francis J. M. Kennedy
*Judy Kinser
*Maui Electric Co. Ltd.
*Mickael Om Mast
*Native Hawaiian Advisory Council
*Native Hawaiian Legal Corporation
*Pat O' Connell
*Caroline Smith
*J. T. Scott
*Sierra Club, Maui Group
*The Hawai'i'-La'ieikawai Association, Inc.
*Rich Von Wellsheim
*Elaine S. Wender

SECTION 14.0
ORGANIZATIONS AND INDIVIDUALS WHO ASSISTED IN THE PREPARATION OF THE EIS

Pacific Planning & Engineering, Inc.

Jonathan K. Shimada	Principal in Charge
Alvin K. U. Chong	Project Manager
Ronald A. Sato	Planner
Gwen N. Zakahi	Planner
Alyssa Miller	Planner

Subconsultants

Agriculture	Mr. Frank S. Scott, Jr., PhD
Air Quality	B. D. Neal & Associates
Chemical Risk Assessment and IGCMP	Environmental & Turf Services, Inc.
Fauna	Mr. Phillip L. Bruner
Flora	Char & Associates
Geotechnical	Pacific Geotechnical Engineers, Inc.
Historic & Cultural	Cultural Surveys Hawaii
Market Feasibility & Economic Impact	PKF Hawaii
Noise	Y. Ebisu & Associates
Social	Earthplan
Traffic	Pacific Planning & Engineering, Inc.
Water Quality	AECOS, Inc.
Water Resources & Supply	Water Resource Associates