

APR 22 1980

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April 22, 1980

Mr. Donald A. Bremner, Chairman
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Bremner:

Subject: Environmental Impact Statement for Panaewa Agricultural
Park

Based upon the recommendation of the Office of Environmental Quality Control, I am pleased to accept the subject document as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding whether or not the action described therein should or should not be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws, and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the proposing agency to weigh carefully whether the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and, together with the comments made by reviewers, provide a useful analysis of alternatives to the proposed action.

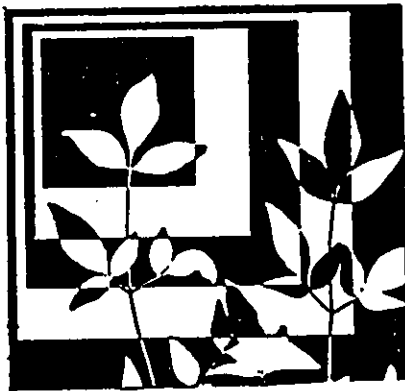
With warm personal regards, I remain,

Yours very truly,


George R. Ariyoshi

cc: Mr. Richard L. O'Connell
Honorable Susumu Ono

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**PANAewa AGRICULTURAL
PARK
REVISED
ENVIRONMENTAL IMPACT
STATEMENT**

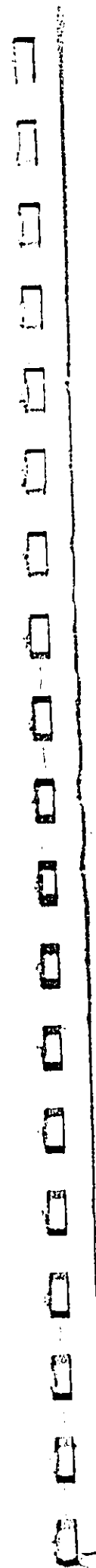
Office of Environmental Quality Control
235 S. Beretania #702
Honolulu HI 96813
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REVISED

ENVIRONMENTAL IMPACT STATEMENT

MARCH, 1980

PROJECT: PANAewa AGRICULTURAL PARK

LOCATION: PANAewa, SOUTH HILO,
ISLAND OF HAWAII, STATE
OF HAWAII

PROPOSING AGENCY: DEPARTMENT OF LAND AND NATURAL
RESOURCES, STATE OF HAWAII

ACCEPTING AUTHORITY: GOVERNOR
STATE OF HAWAII

CONTACT: DIVISION OF WATER AND LAND
DEVELOPMENT
DEPARTMENT OF LAND AND
NATURAL RESOURCES
P. O. BOX 373
HONOLULU, HAWAII 96809
TELEPHONE: 548-7496

CONSULTANTS: HILO ENGINEERING, INC.
484 KALANIKOA STREET
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and

ENVIRONMENT IMPACT STUDY
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TELEPHONE: 537-1988

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SUMMARY

PANAWEA AGRICULTURAL PARK

Panaewa, South Hilo, Hawaii

PROPOSED PROJECT: Panaewa Agricultural Park
PROPOSING AGENCY: Department of Land and Natural
Resources, State of Hawaii
ACCEPTING AUTHORITY: Governor, State of Hawaii

I. PROPOSED PROJECT

The State of Hawaii, Department of Land and Natural Resources proposes development of a 470+ acre agricultural park at Panaewa on the island of Hawaii. The project site is located approximately 5 miles east of downtown Hilo and approximately 5 miles south of General Lyman Field and Hilo Harbor.

The primary objective of the agricultural park is to aid diversified agriculture in Hawaii, a goal set forth in the new Hawaii State Plan. Similar to an industrial park, the agricultural park would bring together agricultural enterprises with compatible interests. By localizing agricultural activities, operating costs and capital improvement costs can be lowered. The State will finance capital improvement costs for the roads, waterlines and drainage.

The proposed agricultural park will contain areas for nursery operations, orchards, a University of Hawaii

farm laboratory and related facilities. However, the operation of the farm laboratory will be independent of the agricultural park. Some 110 acres of the State's land have been set aside for the University of Hawaii at Hilo. Basically, a farm laboratory would be developed which would provide the students an opportunity to learn practical farming and research oriented techniques.

Each tenant of the park must realize a level of income representing more than 50% of his total income from his lot (Section 171-67(3), HRS). The leases will most likely run for 55 years. The lease rent is unknown at this time.

Funds for planning, design and the EIS have been appropriated in the amount of \$120,000 through Act 218 SLH 1974, Item IV-72-A-5, Agricultural Parks Subdivision, Statewide. The State will fund off-site improvements and each tenant, including the U.H., will be responsible for funding his own on-site improvements. Estimated construction costs are in the range of \$884,025 to \$1,069,275, excluding a 15% contingency fund. The higher cost is based on improving all the roads to County standard. Funds for construction will be from Act 214 SLH 1979, Item IV-A-14, Agricultural Park Subdivision, Statewide.

II. EXISTING ENVIRONMENT

The land on which the project site is located was formed by prehistoric lava flows from Mauna Loa volcano.

Mauna Loa is an active volcano which last erupted on July 15, 1975. Seismic activity is fairly common on the island of Hawaii. The soils in the project area belong to the Keaukaha and Papai series. For Papai soil, permeability is rapid, runoff is slow and the erosion hazard is slight. For Keaukaha soil, runoff is medium and the erosion hazard is slight.

The mean annual rainfall is about 130 to 150 inches a year. Occurrences of heavy rainfall are common. Daily temperatures range from the 60's to upper 70's°F, in the winter, and from the mid 60's to the mid 80's°F in summer. The wind blows from the southwest or west-southwest 30% of the time. There are no streams or ponds on the project site. Good quality ground water is abundant in the project vicinity.

The vegetation within the project site can best be described as a highly disturbed lehua/tree fern forest, within which seven sub-units or zones can be distinguished. A fauna survey revealed that only two major wildlife habitats could be recognized, with species overlapping these habitats. The lehua/tree fern forest constitutes one major habitat type, while the urban and agricultural areas surrounding the project site constitute the second major habitat type. Avian species seen include the melodious laughing thrush, white-eye, spotted munia, and house sparrow. Dogs, cats and mongooses were common near the residential areas.

Water to the project area is transported from wells located approximately 3/4 mile north of the project site. Power to the project area is supplied by Hawaii Electric Light Company, Inc. Gas is available through the use of storage tanks serviced by Isle Gas Division of Gasco, Inc. Liquid waste in the project vicinity is disposed of through privately constructed cesspools, approved by the State Department of Health. Solid waste is disposed of at the existing Hilo Sanitary Landfill.

The project area is serviced by the Hilo Police Station. Response time to the area is less than 3 minutes. The project area is also serviced by the Kawailani Fire Station. Response time from the fire station is approximately 5 minutes. Health services to Hilo and the project area are provided by Hilo Hospital.

Regularly scheduled interisland air transportation is provided, as well as direct mainland flights. The project area is also served by shipping lines using Hilo Harbor. Matson and Young Brothers are the primary interisland carriers. The mass transit system serving the area is comprised of County-owned buses which provide daily service between various districts on the Big Island and within Hilo and Kailua-Kona.

Access to the project area is provided via Volcano Road. All roadways in the vicinity of the site are paved

and in good condition except Railroad Avenue, which is an unimproved dirt road. Communications media serving the project area include postal, radio, television, newspaper and telephone service.

III. LAND USE PLANS

The project site is located within a State land use district designated Agriculture. The County of Hawaii General Plan designates the project site as Orchard. The site is zoned Agriculture (A-3a), with a 3 acre minimum lot size.

A new County playground is located north of the project area on Mamaki Street. Surrounding the playground are the Panaewa House Lots. To the west of the site is a forest reserve and to the east are undeveloped Department of Hawaiian Homes lands. There are macadamia nut orchards and sugar cane fields to the south.

IV. ENVIRONMENTAL IMPACTS

The proposed project will generate primary and secondary environmental impacts.

A. Primary Short-Term Impacts

During construction of the agricultural park, there will be a short-term infusion of cash into the local economy. Dust generation is not anticipated to be significant, since the soil type at the site

is not subject to significant wind and water erosion. Exhaust emissions from construction equipment are not expected to significantly affect the air quality of the area. Any burning would require a permit from the Fire Department and the Department of Health.

During site preparation and construction, an increase of ambient noise is inevitable but will be temporary. The ambient noise levels on-site are in most cases below 50 dBA. These noise levels are not considered excessive for an agricultural area.

Vegetation in the project area is not considered rare or endangered by State or Federal agencies. The majority of species are introduced and significant impacts on existing botanical communities are not expected. Terrestrial fauna in the project area include introduced species associated with urbanized areas. The site does not contain any significant wildlife habitat for any endangered species of birds or mammals.

No archaeological sites were observed during the biological reconnaissance of the project area. The Historic Sites Section Director, Division of State Parks, has determined that there are no known historical sites within the project area.

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B. Primary Long-Term Impacts

The long-term economic impact from the proposed project is difficult to ascertain at this time. However, it is the intent of the proposed action to provide land and the necessary infrastructure to aid in the success of individual enterprise.

The long-term environmental impact on the ambient air quality is not anticipated to be significant. The use of pesticides and herbicides in the area should not present a significant problem if applied according to prescribed methods. Certain agricultural crops may require the burning of excess vegetation. As noted, a burning permit would be required.

The use of fertilizers and the use of cesspools for sewage disposal on the project site may eventually have some impact on ground water resources in the area. However, based on available data, there has been no adverse impact on ground water from existing land uses, which are similar to those proposed at the park.

It is not anticipated that noise will be a significant impact on the adjacent areas. There are no schools, churches or hospitals located adjacent to the project area. The project area is not considered to be a sensitive wildlife habitat area, nor does the site contain any endangered species of plants

or animals. Therefore, long-term adverse impacts are not anticipated. The absence of archaeological and/or historical sites within the project area precludes any environmental impacts.

There should be no major problems in providing electrical services to the farm lots, and the amount of electricity required by most of the lots will be minimal. Whatever the project water requirements would be, as determined in later studies, the availability of water is excellent and there should be no problem in providing water for the intended uses of the project.

There are no problems anticipated in disposal of the agricultural solid waste. Liquid waste will have to be disposed of on an individual basis. This will include the use of cesspools or other methods approved by the Department of Health.

Security should not present a major problem to the project area. The impact of additional traffic to this area should be very minimal and should not present any long term traffic problems. Land use in the vicinity of the project site is compatible, with many small farming operations and a rural atmosphere. The project will make farm lots available to both experienced and new farmers. It will aid

in promoting diversified agriculture in the State and will not negatively impact nearby farming operations.

C. Secondary Impacts

Use of this area as an agricultural park will preclude other actions for the land. Farm dwellings are permitted, however. The proposed agricultural park will provide an educational opportunity through the use of a portion of the park by the University of Hawaii at Hilo for students majoring in Agriculture.

V. ADVERSE ENVIRONMENTAL EFFECTS

During the initial construction phase of the agricultural park, a temporary increase in the existing noise level can be expected. This impact will be of short duration and the noise levels can be reduced by the contractor by insuring proper functioning of mufflers on all equipment. The grubbing and clearing of the existing vegetation may result in dust problems but this can be mitigated to a large extent by water sprinkling. The removal of the vegetation will have an impact on the existing wildlife, however, the proposed project site does not contain endangered species of plants and/or animals, nor does it contain sensitive wildlife habitats. Use of this parcel of land for agricultural purposes precludes uses incompatible with that of an agricultural

park. However, the long-term beneficial impacts of securing this parcel of land for agricultural purposes would be realized for many generations. The proposed actions would set aside this land for the people of the State for agricultural purposes and will assist in providing for the diversified economic base on the island of Hawaii.

VI. ALTERNATIVES

A no-action alternative would not accomplish the objectives of the Department of Land and Natural Resources, which are to provide lands for diversified agriculture, to provide land for practical experience in the areas of agriculture and to provide an opportunity for small farmers.

Alternative agricultural park sites were not evaluated because this parcel of land is available for immediate use as an agricultural park. Development of this parcel is desirable since the cost of land acquisition is not a factor, and since the infrastructure items needed to support an agricultural park are presently available.

The project site is designated Agriculture according to the State land use district, Orchard according to the General Plan for the County of Hawaii, and zoned A-3a. Alternative uses of the land other than those compatible with the land use designation would require changes in the State land use designation as well as County Plan designation and zoning.

VII. RESOURCE COMMITMENT

State funds, labor, construction building materials and fuel will be committed to the project. Additional manpower, fuel, fertilizer and pesticides will be utilized by the individual farmers for cultivation of the agricultural products.

VIII. SHORT TERM USES - LONG TERM PRODUCTIVITY

The proposed project will not involve trade-offs between short-term environmental gains at the expense of long-term losses, foreclose future uses of the area, narrow the range of beneficial use of the environment, or propose long-term risks to health and safety.

IX. GOVERNMENT POLICY OFFSETTING ADVERSE EFFECTS

The development of an agricultural park in this area will be in accordance with the goals and objectives set forth in Chapter C, 171, Part IV of the Hawaii Revised Statutes, to strengthen diversified agriculture in Hawaii by a plan that "combines and concentrates in a common location, agricultural activities for the purpose of production and distribution of the economy".

proposed project 1

SECTION 1

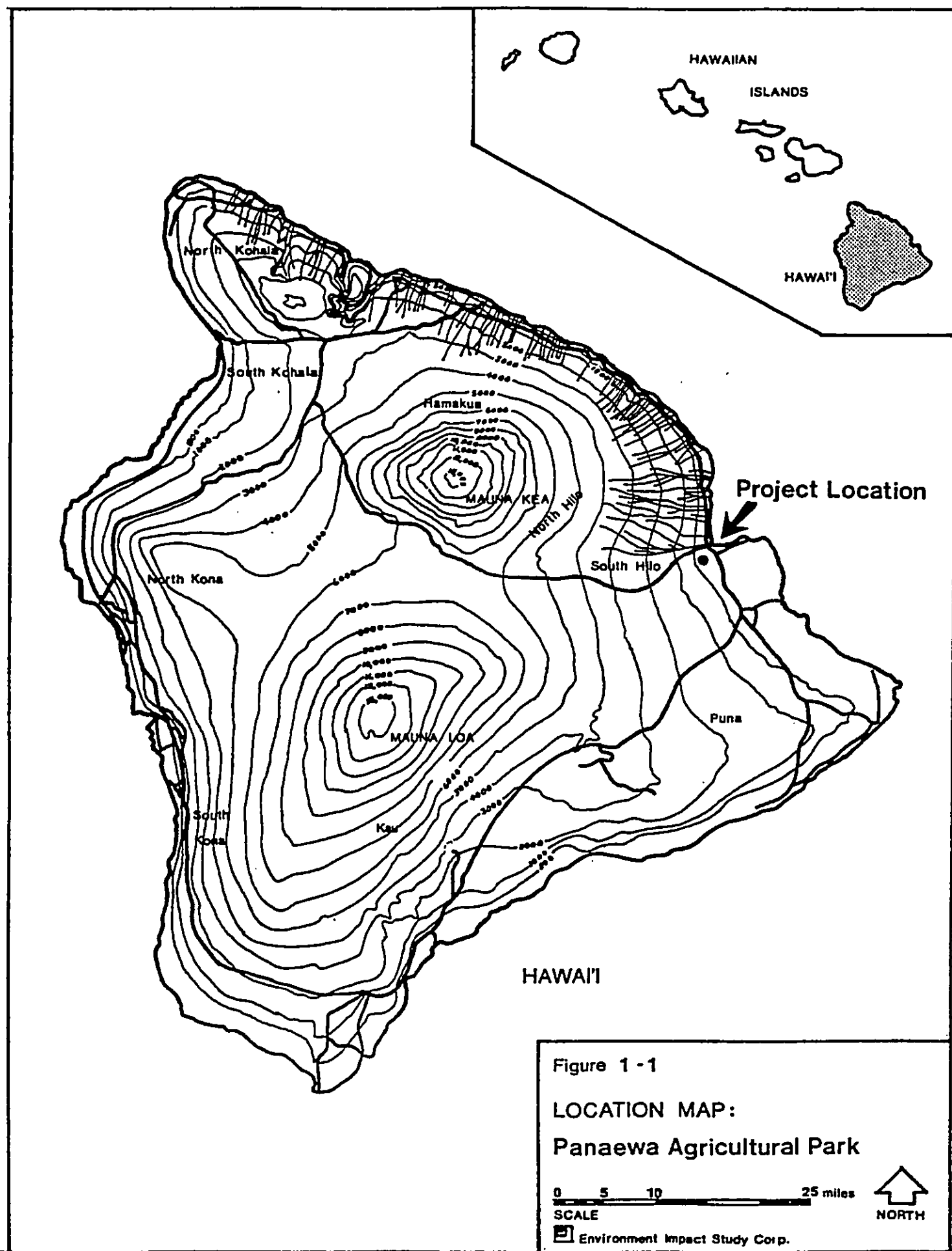
DESCRIPTION OF THE PROPOSED PROJECT

I. INTRODUCTION

The State of Hawaii Department of Land and Natural Resources proposes development of a 470+ acre agricultural park at Panaewa on the island of Hawaii, TMK 2-02-48:portion of 3 and 4 (See Figures 1-1, 1-2 and 1-3). The project site is located approximately 5 miles east of downtown Hilo and approximately 5 miles south of General Lyman Field and Hilo Harbor. The 470+ acre development will be on land owned by the State (Figure 1-3).

II. GOALS AND OBJECTIVES OF THE PROPOSED ACTION

The primary objective of the Agricultural Park is to aid diversified agriculture in Hawaii, a goal set forth in the new Hawaii State Plan. This is accomplished by combining a number of relatively small independent agricultural operations into one area. Similar to an industrial park, the Agricultural Park would bring together agricultural enterprises with compatible interests. By localizing agricultural activities, operating costs and capital improvements such as water lines, irrigation lines, storage facilities, and road systems can be lowered. The full



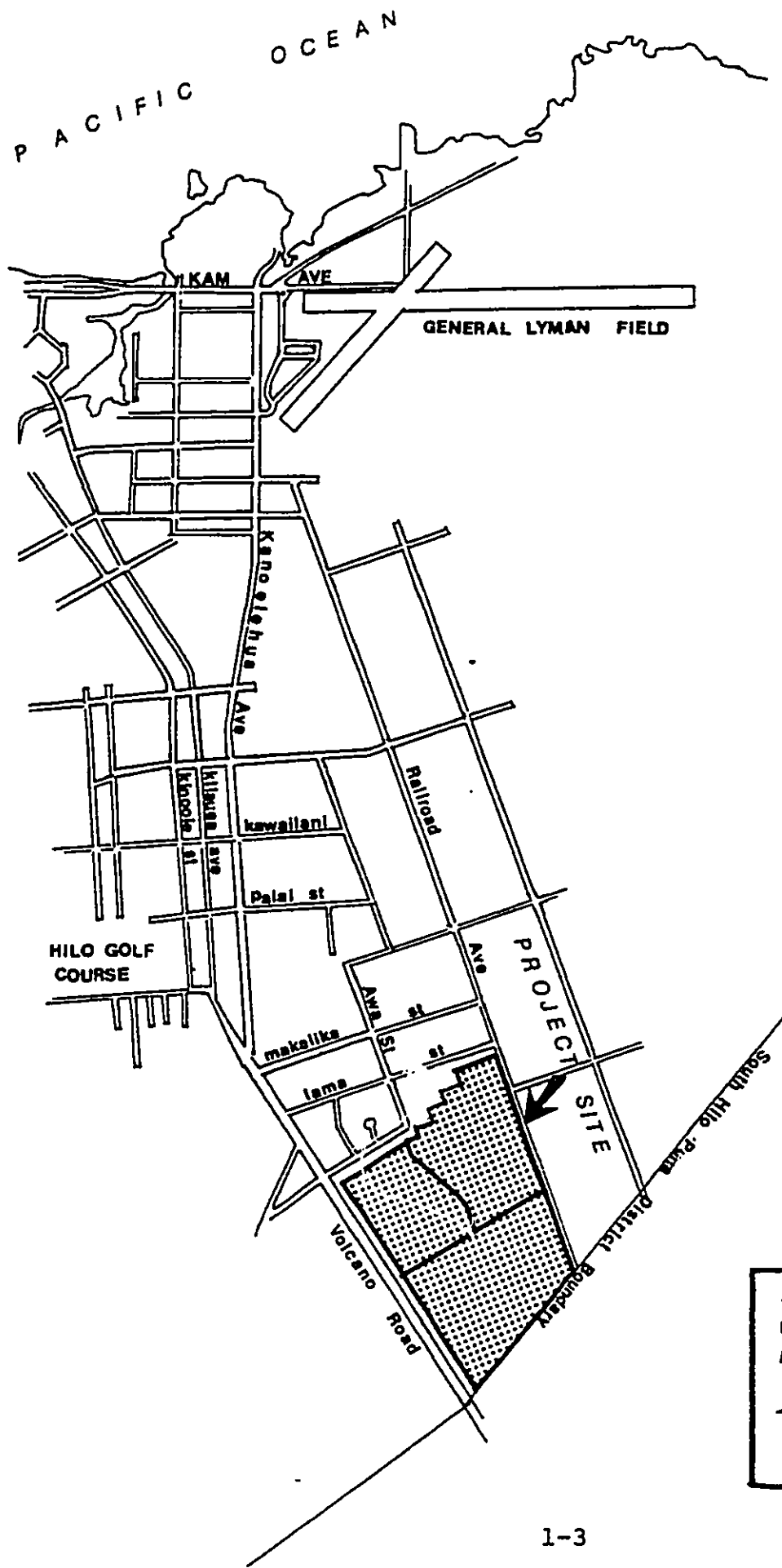



FIGURE 1-2
 LOCATION MAP:
 Panaewa Agricultural Park


 NORTH

extent to which the State or the tenants would participate in financing and managing the Agricultural Park has not be determined. However, the State will finance capital improvement costs for the roads, waterlines and drainage.

The State of Hawaii needs numerous productive industries to ensure a stable economy. The two largest economic factors are tourism and Federal expenditures, both vulnerable to political and social changes. In contrast, agriculture will continue to meet a steady rising demand. It is the goal of the State to make Hawaii as self-sufficient in as many foods as possible and to provide a stable economic base by exporting agricultural products, which will ensure economic stability in the future. The project will help meet the goals and objectives set forth in the Hawaii State Plan, as discussed in Section 3 of this report.

Therefore, the objective of the Agricultural Park set forth in Chapter 171, Part V of the Hawaii Revised Statutes, is to strengthen diversified agriculture in Hawaii by a plan that "...combines and concentrates in a common location agricultural activities for the purpose of production and distribution economies."

III. THE PROPOSED AGRICULTURAL PARK

The proposed Agricultural Park will contain areas for nursery operations, orchards, a University of Hawaii farm laboratory and related facilities. However, the operation and management of the farm laboratory will be independent and will not be part of the Agricultural Park. The proposed preliminary layout is shown on Figure 1-4.

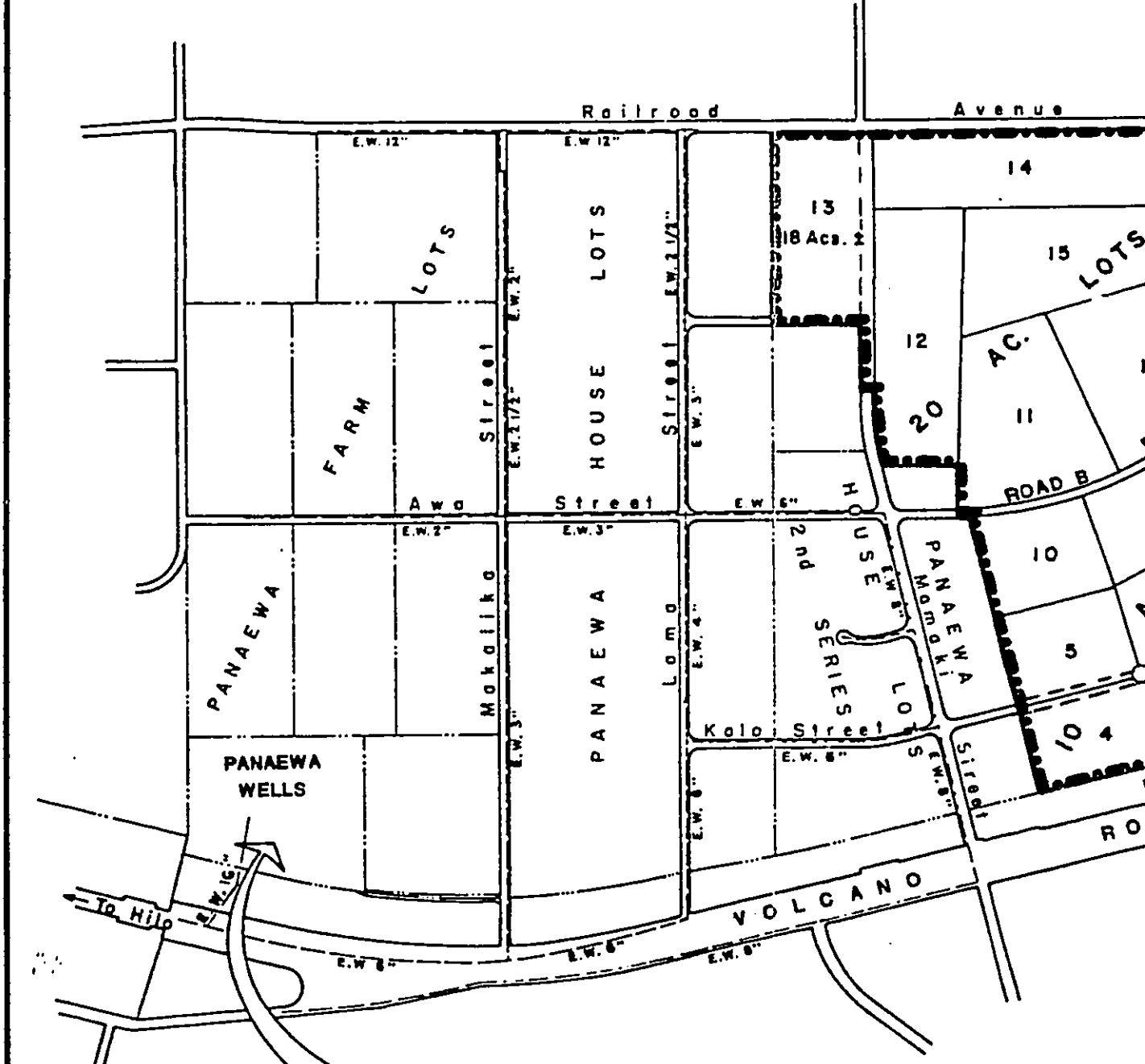
Of the 470+ acres*, the proposed Agricultural Park will be designed as follows:

Nursery and orchards	20 lots (10 acres each) 6 lots (20 acres each)
Agriculture-related support facilities	2 lots (2 acres each)
University of Hawaii	1 lot (110 acres)
• Roads, windbreaks and other non-agricultural uses	36+ acres

This design allows for suitable land areas to be dedicated for these general agricultural activities. The nursery and orchard lots will be distributed by the Board of Land and Natural Resources, on a lease basis. Two 2-acre lots have been set aside for agriculture-related facilities to provide the farmers with additional space

* The exact acreage and the total number of lots available is pending clarification of the South Hilo-Puna District boundary by the Survey Division of the State Department of Accounting and General Services (DAGS).

DEPT. OF HAWAIIAN HOME LANDS
 PANAWEA HOUSE AND FARM



(County of Hawaii)
 (Bd. of Water Supply)
 EXEC. ORD. 2079
 WELL FIELD SITE

NOTE: FINAL LAYOUT AND NUMBER OF LOTS TO DEPEND ON FIELD CONDITIONS

for uses which may be deemed necessary for the Agricultural Park's overall operations and maintenance. These lots will require a special permit since they are below the 3-acre minimum lot size.

One hundred-ten acres of the State's land have been set aside for the University of Hawaii at Hilo. Uses proposed by the University of Hawaii are described in Appendix A. Basically, a farm laboratory would be developed which would provide the student an opportunity to learn practical farming and research oriented techniques. Operations and maintenance of the University facility will be independent of the proposed Agricultural Park and the Department of Land and Natural Resources.

The State will design and develop the support facilities and lot layouts. Support facilities will include providing an 8- and 12-inch water mains and 2-inch water laterals, a main access road to each lot, and telephone and electrical service along the main access. Liquid waste facilities will be constructed and paid for by each tenant. Disposal of solid waste will also be the responsibility of each tenant.

Each tenant must realize a level of income representing more than 50% of his total income from his lot (Section 171-67(3), H.R.S.). The Land Board will set the dates by which the tenants must comply with this requirement,

based upon the commodity and the market. The leases will most likely run for 55 years. The lease rent is unknown at this time.

IV. PHASING AND FUNDING

A. Phasing

Development time of the support facilities is estimated at one to one-and-a-half years after all approvals have been given and the contract has been awarded.

B. Funding

Funds for planning, design and the EIS have been awarded in the amount of \$120,000 through Act 218 SLH 1974, Item IV-72-A-5, Agricultural Park Subdivision, Statewide. The State will fund off-site improvements and each tenant, including the U.H., will be responsible for funding his own on-site improvements.

Construction costs will vary, depending on the size and type of roads and other facilities to be developed. Estimated costs are in the range of \$884,025 to \$1,069,275, excluding a 15% contingency fund. The higher cost is based on improving all the roads to County standard (See Table 1-1). Funds for construction will be from Act 214 SLH 1979, Item IV-A-14, Agricultural Park Subdivision, Statewide.

TABLE 1-1
PRELIMINARY CONSTRUCTION COST ESTIMATE*

Proposed water system	\$434,525.00
Proposed utility system	68,000.00
Proposed road system (improve all roads to County standard)	<u>566,750.00</u>
	\$1,069,275.00
Contingency fund (15%)	<u>160,391.25</u>
	\$1,229,666.25

* NOTE: Cost estimates for drainage facilities are not included. If final design requires drainage facilities, drywell sumps will be constructed at an estimated cost of \$7,500.00 each.

existing environment 2

SECTION 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

I. PHYSICAL CHARACTERISTICS

A. Geology and Soils

1. Geology

The land on which the project site is located was formed by prehistoric lava flows from Mauna Loa Volcano (Macdonald, 1970), whose summit rises 13,677 feet above sea level and is southwest of the project area. Mauna Loa is believed to have been formed around three successive centers and the present active cone has covered the earlier ones, thus forming one enormous shield.

The Mauna Loa shield is crossed by two principal rift zones trending southwest and east-northeast, and intersecting at the summit caldera. Figure 2-1 shows the principal rift zones and subordinate rift zones of Mauna Loa.

Mauna Loa is an active volcano which last erupted on July 5, 1975 and lasted less than one day. The eruption previous to the July 5, 1975 eruption was on June 1, 1950 and lasted

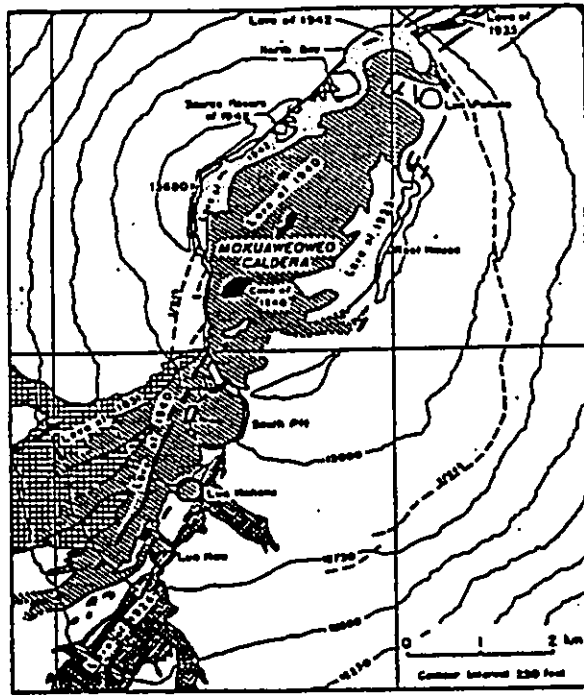


FIGURE 2-1
GEOLOGY

Source: Gordon A. MacDonald & Agatin T. Abbott
"Volcanoes in the Sea"
 (©1970 - University Press of Hawaii)

for 23 days. The 1950 eruption was one of the two greatest historic eruptions of Mauna Loa when more than 600 million cubic yards of lava were extruded. The recent activity from Mauna Loa suggests that future eruptions are probable.

Seismic activity is fairly common on the island of Hawaii. Thousands of earthquakes from the active volcanoes are constantly recorded; however, few are strong enough to cause major damage. Table 2-1 lists earthquakes of magnitude 5 or greater (Richter scale) from the State.

2. Soils

The soils in the project area belong to the Keaukaha and Papai Series. The U. S. Department of Agriculture, Soil Conservation Service classifies most of the land as Papai extremely stony muck, 3 to 25 percent slopes (rPAE). Small sections are classified as Keaukaha extremely rocky muck, 6 to 20 percent slopes (rKFD). Brief descriptions of these soil types are presented below (SCS, 1973) (Figure 2-2).

Papai extremely stony muck, 3 to 25 percent slopes (rPAE)

This soil type is a very dark brown, ex-

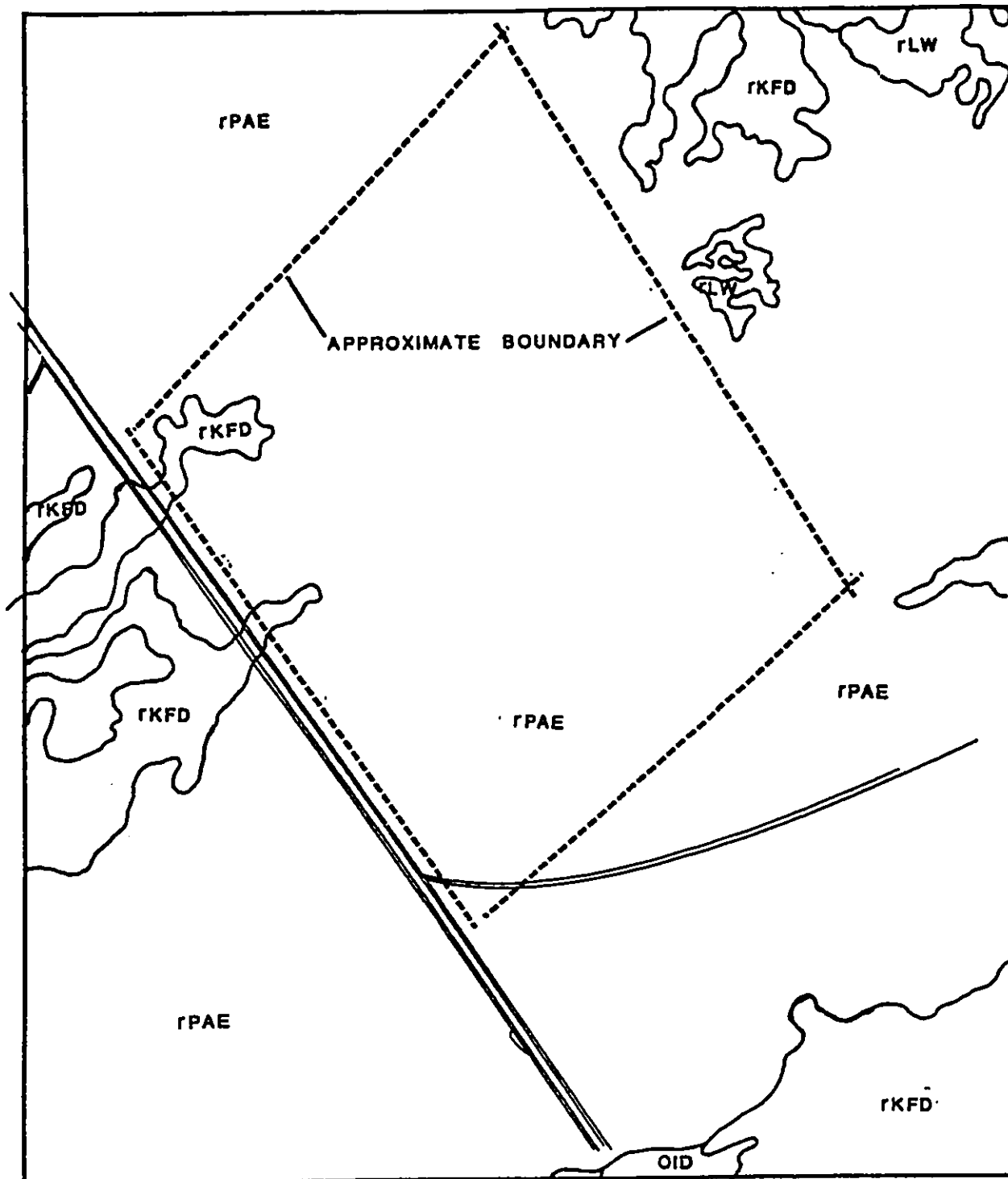
TABLE 2-1

EARTHQUAKES OF MAGNITUDE 5 OR GREATER: 1957 TO 1977

DATE	LOCATION	Magnitude (Richter Scale)
1957: August 18	E. of Hana, Maui	5.6
1961: September 25	Hawaii	5.75-6
1962: June 27	Hawaii	6.1
June 28	Hawaii	5.75
1963: October 23	Hawaii	5.4
1964: October 11	W. of S. Kona	5.3
December 10	Hawaii	5
1969: May 9	Hawaii	5
1971: August 1	S.E. of Hawaii	4.5-5
1972: December 23	W. of Kona	5
1973: April 26	Hawaii	6.2
October 9	Hawaii	4.8-5
1974: November 30	Hawaii	5.5-6
1975: Jan. 1, 2:41 AM	Near Pahala, Hawaii	5.1
Jan. 1, 3:20 AM	Mauna Loa, Hawaii	5.1
Jan. 2	Near Pahala, Hawaii	5.6
Jan. 5	Mauna Loa, Hawaii	5.1
Nov. 29, 3:35 AM	Puna, Hawaii	5.7
Nov. 29, 4:47 AM	Puna, Hawaii	7.2

SOURCE: Augustine S. Furumoto, N. Norby Nielsen, and William R. Phillips, A Study of Past Earthquakes, Isoseismic Zones of Intensity and Recommended Zones for Structural Design for Hawaii (University of Hawaii, Center for Engineering Research, June 15, 1972), pp. 16-19; Hawaii Institute of Geophysics, records. Complete to August 1, 1977.

County of Hawaii Data Book, 1977.



Note:
 Soils on-site are designated as "Other Important Agricultural Land" - land other than Prime or Unique Agricultural Land that is also of statewide or local importance for agricultural use.

figure 2-2
 soil map

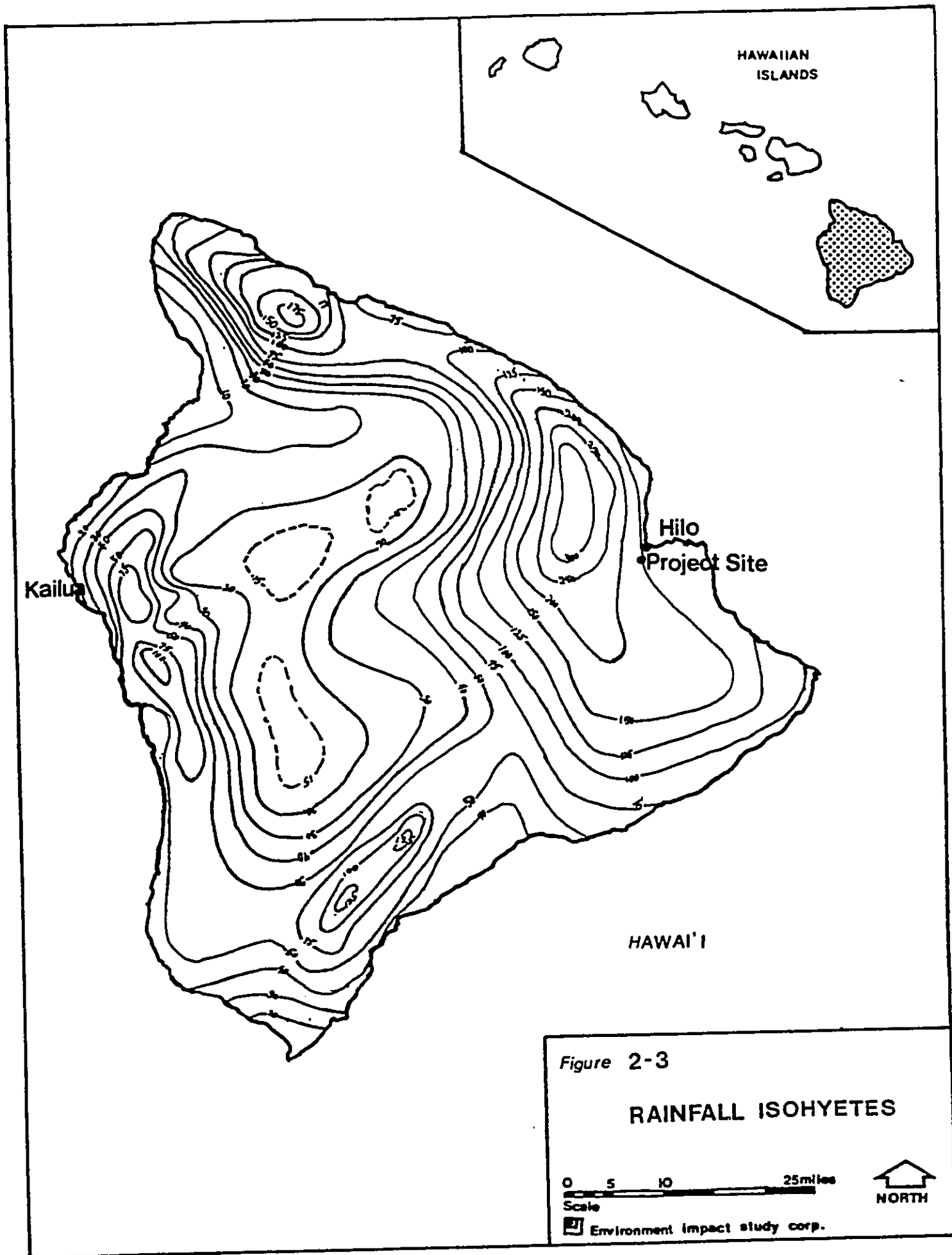
tremely stony muck about 8 inches thick. The soil is slightly acid and is underlain by fragmental Aa lava. The soil is friable, slightly sticky, slightly plastic, and contains many roots and fine pores. Soil permeability is rapid, runoff is slow and the erosion hazard is slight. Papai soils are used for woodland, pasture, orchards and truck crops.

Keaukaha extremely rocky muck, 6 to 20 percent slopes (rKFD)

This soil type is very dark brown muck about 8 inches thick underlain by pahoehoe lava bedrock. Rock outcrops occupy about 25 percent of the area. The soil is friable, slightly sticky, slightly plastic, and contains many roots and fine pores. It is strongly acid. Soil permeability is rapid. The underlying pahoehoe lava is very slowly permeable but drainage is rapid through the cracks. Runoff is medium and the erosion hazard is slight. Keaukaha soils are used for woodland, pasture and homesites.

B. Climate

At the project site, the mean annual rainfall is about 130 to 150 inches a year (see Figure 2-3).



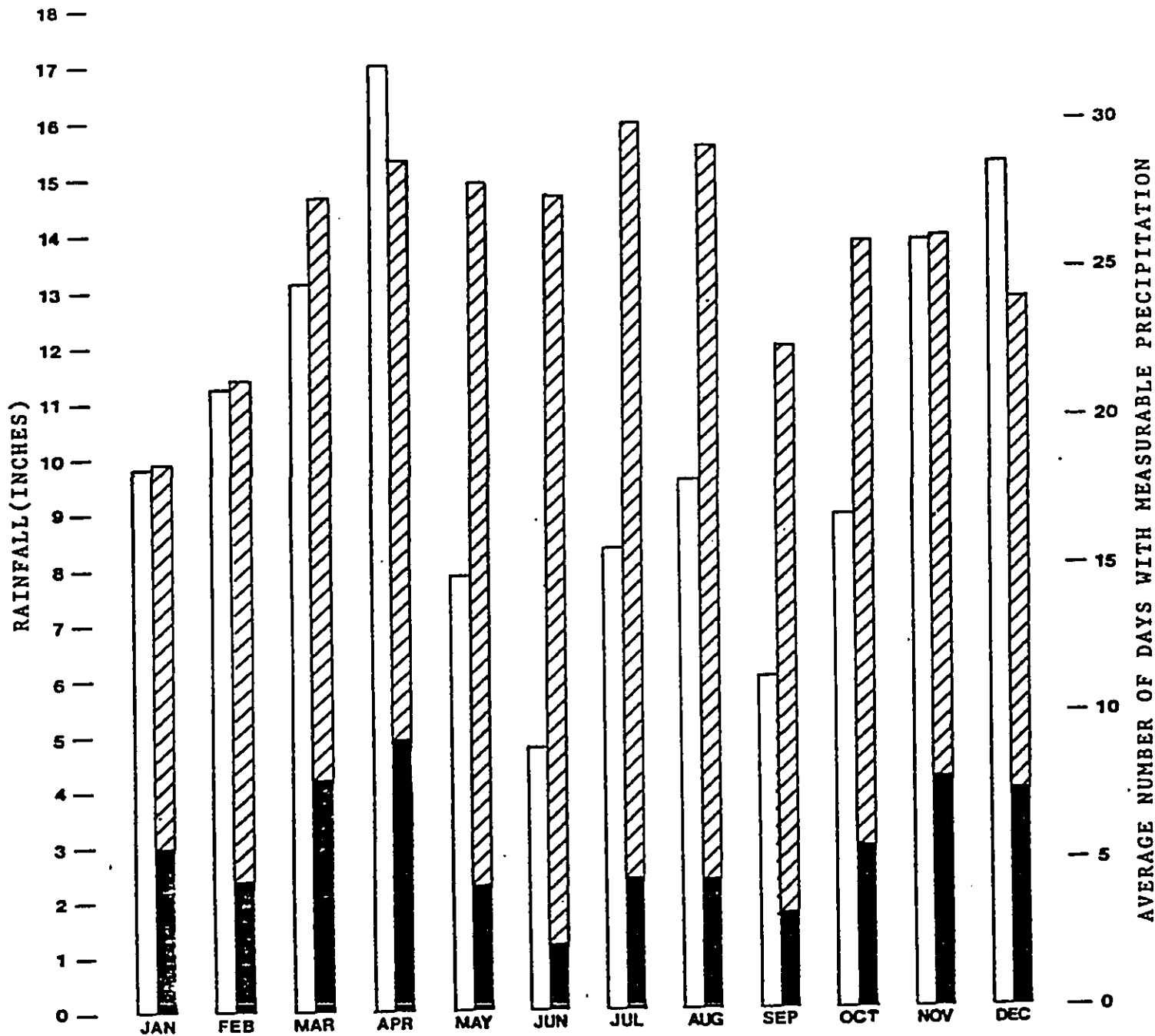
The weather station at General Lyman Field (Hilo WSO 87 AP), located approximately 5 miles north of the study area recorded a mean annual rainfall of 125.40 inches in the 12 year period 1966-1977. Considerable variability occurred during this period, with annual rainfall ranging from 90.38 inches in 1977 to 173.23 inches in 1969. The past six years have been exceptionally dry for Hilo with rainfall averaging 104.12 inches per year.

The station's mean monthly distribution of rainfall for this period is shown in Figure 2-4. Most of the precipitation falls between October to May when mid-latitude storm systems are prevalent.

Days with measurable precipitation (0.01" or more) occur frequently in the study area. During the 1966-1977 period they ranged from an average of 26.5 days per month during July to 16.5 days per month in January. Days with measurable precipitation occur most frequently from March to August.

Occurrences of heavy rainfall are common. Days with rainfall over 0.5 inches (measured at the General Lyman Field Station) averaged to 65.6 days a year during 1966-77. The month most likely to have "rainy days" (0.5 inches of rain or more) is April and the one least likely is June (Figure 2-4).

RAINFALL, HILO WSO 87 AP 1966-1977



White bars: monthly rainfall average (inches)

Black bars: average number of days per month when rainfall exceeds 0.5 inches

Hatched bars: average number of days per month when there is measurable precipitation (0.01 inches or more)

Data obtained from: Climatological Data, Hawaii and Pacific, National Oceanic and Atmospheric Administration, Environmental Data Service.

figure 2-4
RAINFALL

The temperature climate of the General Lyman Field weather station is shown in Figure 2-5 (Department of Geography, University of Hawaii, 1973). Generally, daily temperatures range from the 60's °F (15°-20°C) to upper 70's °F (25°C) in the winter, and from mid 60's °F (18°C) to mid 80's °F (30°C) in summer. Temperature extremes have reached from the low 50's °F (19°C-12°C) to the low 90's °F (32°C-33°C). (Figure 2-5).

A tabulation of the percentage frequency of wind direction and speed for all hours from 1949-1947 (Table 2-2) shows that the wind blows from the southwest or west-southwest 30 percent of the time. The average speed is 6.5 knots (7.5 mph) with calm periods occurring 4.1 percent of the time. The maximum wind speed reported at that station is 30 mph (in January 1968 and December 1973).

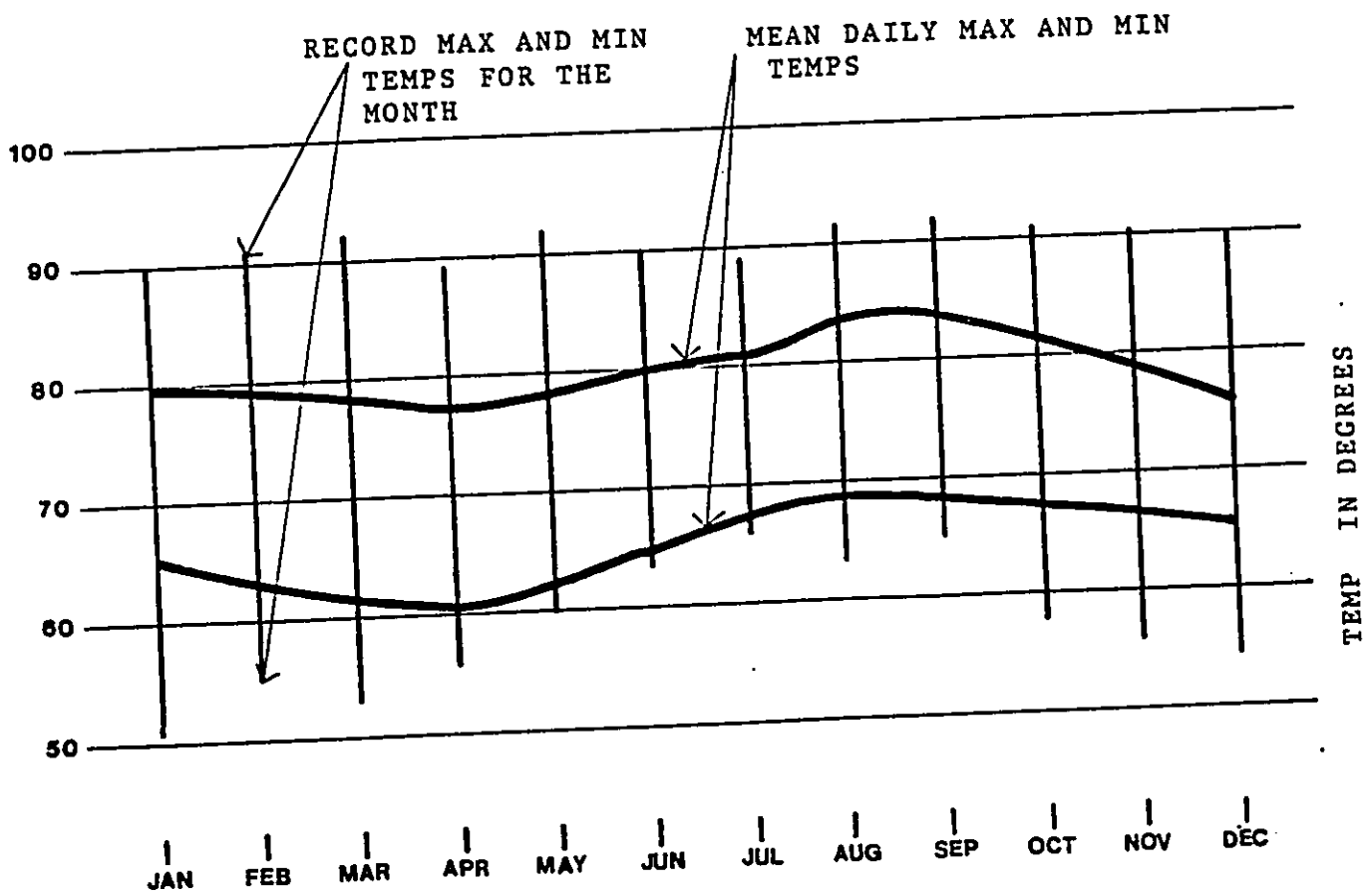
C. Hydrology

1. Surface Water

There are no streams or ponds within or near the project site.

2. Ground Water

Basal water underlies the Puna and South Hilo areas, with the possible exception of the east rift zone of Kilauea. Rainfall and recharge



TEMPERATURE CLIMATOLOGY - HILO AIRPORT
 (FROM ATLAS OF HAWAII, DEPT. OF GEOGRAPHY, U.H. 1973)

TABLE 2-2

SURFACE WINDS

PERCENTAGE FREQUENCY OF WIND
DIRECTION AND SPEED
(FROM HOURLY OBSERVATIONS)

21504 STATION HILLO HAWAII WBAP STATION NAME 49-67 YEARS ALL MONTHS
ALL WEATHER CLASS ALL HOURS (L.S.T.)

CONDITION

SPEED (KNTS) DIR.	1-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	48-55	≥56	%	MEAN WIND SPEED
N	.5	1.6	2.6	1.1	.2	.1	.0					6.0	8.3
NNE	.4	1.1	2.2	1.0	.1	.0	.0					4.7	8.2
NE	.6	1.5	2.7	1.3	.0		.0					6.2	8.0
ENE	.3	1.0	2.3	1.5	.1	.0						5.1	8.9
E	.4	1.2	2.5	1.6	.1	.0						5.8	8.7
ESE	.3	.9	1.9	1.6	.2	.0						4.8	9.5
SE	.5	.0	1.1	.9	.1	.0						3.5	8.6
SSE	.3	.7	.7	.4	.1	.0	.0					2.3	5.0
S	.9	1.7	1.1	.2	.0	.0	.0					4.3	5.9
SSW	1.5	3.5	1.6	.1	.0	.0						6.4	5.3
SW	3.3	7.6	3.7	.1	.0	.0						14.6	5.2
WSW	2.3	7.6	5.2	.2	.0	.0	.0					12.3	5.7
W	1.4	4.0	3.0	.2	.0	.0						6.6	5.6
WNW	.6	1.4	.7	.0		.0						2.7	5.3
NW	.7	1.0	.7	.1	.0							2.5	5.5
NNW	.4	1.0	1.0	.3	.1	.0	.0					2.7	7.1
VARBL													
CALM													
	14.4	36.7	33.2	10.5	1.0	.2	.0					100.0	6.5

Source: Saul Price, Department of Land and Natural Resources,
Division of Water and Land Development

are high, and ground water circulation is probably rapid, thus, basal water of good quality is abundant (DOWALD, 1970). Results of water quality sampling at Panaewa Well are given in Appendix B.

II. BIOLOGICAL CHARACTERISTICS

A. Flora

Introduction

The foundation for ecological studies in the Hawaiian Islands has been set by the description of vegetation zones. The classifications of Hawaiian vegetation by Hillebrand (1888) and Rock (1913) were based on altitude, climate and physiognomy and were the basis for later classifications (Egler, 1939; Robyns and Lamb, 1939; Ripperton and Hosaka, 1942); and ecological and vegetational studies which were conducted at the Hawaii Volcanoes National Park (Newell, 1968; Rajput, 1968; and Doty and Mueller-Dombois, 1966), but no extensive work has been done in the project area. In contrasting successional trends in coastal and lowland forest, Atkinson (1970) established one sampling site along Stainback Highway approximately one mile above the project area at approximately 300 feet elevation. He characterized the vegetation as a Metrosideros/Cibotium forest

with such secondary species as Psidium guajava and Coffea sp.

In 1976, an environmental assessment was made of a portion of the forest adjacent to the study site (Neighbor Island Consultants, 1976). The vegetation was described as a disturbed wet forest with few native species. In determining the floristic composition, eight plots were established and although no quantitative data was compiled, the vegetation in each plot was described qualitatively.

Methodology

Prior to the field investigation, an aerial photograph of the area was studied to determine vegetation types. Once in the field, a walk-through survey technique was employed and relative abundance of each species was recorded. To further substantiate the vegetation types, seventeen 10-meter-square plots were established and the percent cover for each species within the plots was estimated.

Discussion

The project site lies within Ripperton and Hosaka's vegetation zone D, low phase, which is characterized by shrub and closed forests of such species as guava, sensitive plant, Boston fern, Hilo grass and staghorn fern (Table 2-3). Field investigations,

TABLE 2-3
HAWAII VEGETATION ZONES, THEIR ALTITUDE AND ANNUAL RAINFALL LIMITS, AND CHARACTERISTICS OF NATURAL VEGETATION
 Ripperton and Hosaka (1942)

Zone	Phase	Approximate Altitude Limits	Approximate Rainfall Limits (Inches)	Vegetation Characteristics	
				Natural cover	Species
A		Less than 1000	20 or Less	Xerophytic shrub with coastal fringe of trees	aloha, kua haole, swollen finger grass, feather fingergrass, pili grass, bristly fox tail
B		Less than 3000	20 - 40	Xerophytic shrub with some trees in upper part	lantana, kua haole, klu, cactus, ulaloa, ilima, false mallow, Natal redtop, pili grass, native panicum, hakanakona
C	1-low	Less than 2500	40 - 60 ¹	Mixed open forest and shrubs	Kua haole, guava, lantana, Spanish clover, Bermuda grass, kukupuza, pilipitula
	2-high	2500-4000		Mixed open forest	Bermuda grass, Spanish clover, wild geranium, bristly-fruited mallow, plantain, rattail
D	1-low	Less than 1500 ²		Shrub and closed forest	guava, sensitive plant, Boston fern, lilo grass, rice grass, basket grass, lunohono, staghorn fern
	2-med.	Variable	60 or more	Closed forest	ohia lehua, tree fern, staghorn
	3-high	4000 to less than 7000		Open forest	kua, pukamole, sheep grass, mountain pili, rattail, alapaio fern, tree fern
E	1-low	4000-7000		Open forest and shrub	kua, mami, heu pueo, mountain pili, large Hawaiian lovegrass, kalamaua, sweet vernal, bracken fern, alapaio fern, Kentucky bluegrass
	2-med.	7000-10,000	50 or less	Mainly upland open shrub	Mami, nani, Raillardia, heu pueo, kalamaua, bracken fern
	3-high	Over 10,000		No seed-bearing plants	barren except for mosses and lichen. (Occasional clumps of silver sword and Hawaiian bent grass).

1. Minimum rainfall is less than 60 inches at higher levels.

2. The boundary between D₁ and D₂ varies with location and present utilization. In general it represents the highest point of satisfactory utilization for most crops, as adjudged by climate, soil type, and present crops growing.

however, revealed that the vegetation more closely resembles the Metrosideros/Cibotium (lehua/tree fern) forest which Atkinson described (1970). This coincides with Ripperton and Hosaka's zone D, medium phase.

A sugar cane field, houses and farm lots surround the project site on three sides. Several farm lots are located within the site on the north side. Several of these lots contain macadamia and quava orchards while others contain lychee and various species of citrus. Small plant nurseries specializing in such ornamentals as dracaena, ti, anthurium, calathea, maranta, avocado, vanda and dendrobium can also be found in the area. These cultivated species are excluded from this report.

Description of Vegetation Units

The vegetation within the project site was probably a complete Metrosideros/Cibotium forest at one time. However, an aerial photograph reveals several old bulldozed pathways. Note the letter to the Office of Environmental Quality Control (OEQC) in Section 12. This, and perhaps other disturbances, has resulted in much secondary growth. Thus, the general vegetation can best be described as highly disturbed Metrosideros/Cibotium forest. Seven subunits (zones) can be distinguished (Figure 2-6):

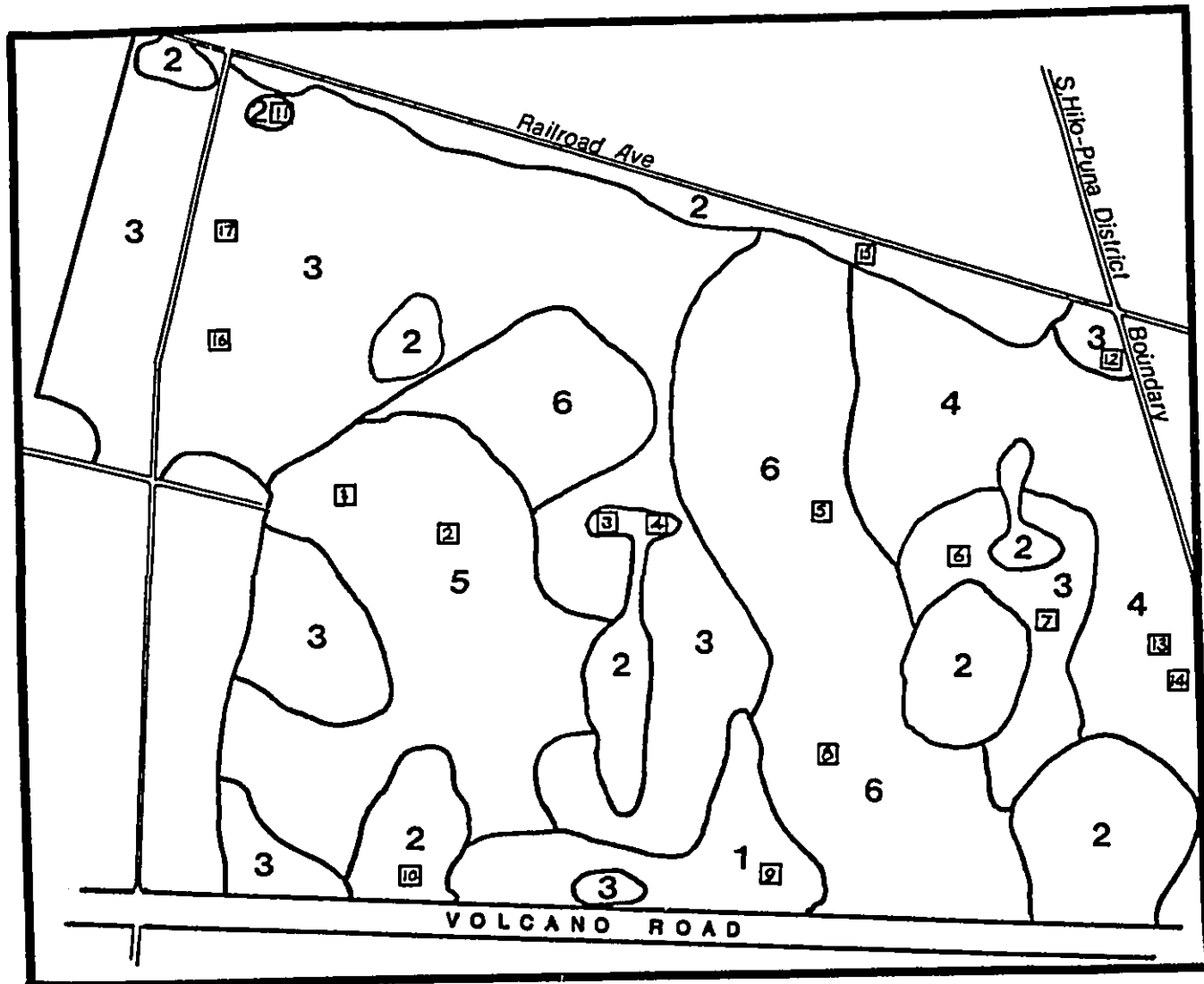


figure 2-6

1. vegetation zone

see pg. 2-24

□ plots

1. Psidium cattleianum forest. This vegetation type is characterized by dense, closed stands of Psidium cattleianum (strawberry guava) about 10-20 feet in height. P. cattleianum is by far the dominant species, affording about 90% cover while Nephrolepis exaltata (sword fern) is the dominant ground cover. Only one other species (Melochia) was recorded as having more than 10% cover.

2. Melastoma-Dicranopteris scrubland. Several sections in the project site are covered by dense stands of Melastoma (Indian rhododendron) and/or Dicranopteris (uluhe) six to ten feet in height and occasionally forming a nearly continuous shrub layer. Psidium cattleianum often grows within or on the periphery of these scrublands. In some areas, as in Plot #2, the shrub layer which may cover as much as 85-90% of the ground is so dense that it is nearly impenetrable. In these sections, there are very few other shrubs, virtually no trees and a depauperate herb layer. A decrease in the cover of the shrub layer results in the increase in the number of species in the herb layer. When present, the trees are usually Metrosideros, Cecropia (trumpet tree) and Melochia. As evidenced by an aerial photo of the area, this

vegetation sub-unit may often be associated with bulldozing operations.

3. Metrosideros - Cibotium forest. This probably comes closest to resembling the original vegetation of the area. It consists of a tall tree layer of Metrosideros 50-80 feet in height with a shrub layer of Cibotium and an herb layer of Nephrolepis. The major sub-dominant species are Psychotria hawaiiensis (kopiko), Psidium cattleianum and Eupatorium, but in the north end Psychotria is replaced by Michelia champaca (mulang).

4. Cecropia - Psidium cattleianum - Cibotium forest. Much of the vegetation in the south section of the project area is of this type. Metrosideros and Cecropia are dominant in the open-canopied tree layer (40% cover), Psidium cattleianum and Cibotium are dominant in the very dense shrub layer and Nephrolepis is dominant in the herb layer. There is abundant Paederia foetida (maile pilau) in this section.

5. Tall Melochia - Cecropia - Michelia closed forest. This is the dominant vegetation type in the northwest section of the project

area and is somewhat similar to zone 4 except that here the tree layer is dense (more than 50% cover) and consists mainly of Michelia, Cecropia and Melochia. The shrub layer is a mixture of Melastoma, Perrottetia (olomea), Psidium cattleianum and Psychotria with no single species becoming dominant. The herb layer consists mainly of Nephrolepis and Eupatorium. Cibotium may be locally abundant in some areas.

6. Melochia - Cecropia - Psidium cattleianum scrub forest. A substantial portion near the center of the project area is characterized by this scrubby forest of Psidium cattleianum, Cecropia and Melochia about 15-40 feet in height. These three dominant species which account for 30-70% of the vegetation cover are found in the tall shrub layer, while Cecropia and Melochia reach into the tree layer. Nephrolepis is dominant in the herb layer.

7. Roadside (not shown in Figure 2-6). Along the roadways and along other exposed areas many wayside herbaceous and annual species are found. These include Mimosa pudica, Ageratum houstonianum, Desmodium canum, Euphorbia prostrata, Bidens pilosa and Cassia leschenaultiana.

Possible Impact and Areas of Concern

Because of the highly disturbed nature of the vegetation and because the area is almost surrounded by cultivation, the proposed project will have no significant impact on the flora. Also, the native plants on the site are rather common throughout the island.

Special attention should be given to the Cannabis (hemp) found in the area. It is apparent that these plants were being cultivated and, although only three "plantations" were found, several more may be in the area. Another Environmental Assessment survey uncovered a planting of 34 well-cared for plants (Neighbor Island Consultants, 1976), indicating that the Panaewa Forest Reserve may be an extremely popular area for such illegal cultivation.

Species Checklist (Table 2-4)

Families are listed alphabetically within each of three groups: Pteridophyta, Monocotyledonae, and Dicotyledonae. Genera and species are arranged alphabetically. Taxonomy and nomenclature of pteridophytes follow Wagner's unpublished Checklist of Hawaiian Pteridophytes, except where more commonly accepted names are listed. Taxonomy and nomenclature of flowering plants follow St. John (1973). Common

Hawaiian names used in the checklist are in accordance with Porter (1972) or St. John.

For each species, the following information is provided:

1. Scientific name.
2. Vernacular name, when commonly used, or Hawaiian name when known.
3. Status of the species. The following symbols are employed:
 - E endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.
 - I indigenous, i.e., native to the Hawaiian Islands but also occurring naturally (without the aid of man) elsewhere.
 - X exotic, i.e., plants of accidental or deliberate introduction after the Western discovery of the islands.
 - P Polynesian introduction; it includes those plants brought by the Polynesian immigrants previous to Captain Cook's discovery of the islands.
4. Federal Register (FR) Federal Register entry, June 16, 1976. .
 - E endangered (a taxon which is in danger of extinction throughout all or a significant portion of its range -- def. from Pub. Law 93205).
 - * plant taxon for which information on living specimens is especially desired (by U. S. Fish and Wildlife Service Office of Endangered Species).

5. F. R. Fosberg and Derral Herbst (FH) - Listing of rare and endangered species of Hawaiian vascular plants.

A list of symbols and their explanations are given below:

- EX extinct
- R rare, total population low, whether dangerously so or not
- L local, found only or principally in one or more restricted areas
- D depleted, much less common over all or most of its range than formerly, the depletion directly or indirectly the result of human activities
- EN endangered, in considerable danger of disappearance
- C in cultivation
- W having a wider distribution than the Hawaiian Islands, corresponding to St. John's use of the term "indigenous" in his list
- U uncertain, insufficient information available to us to decide if endangered
- P protected
- DE population apparently decreasing
- S population apparently stable
- I population apparently increasing
- v very
- o only

pr probably

po possibly

6. Relative abundance of the species within the project area. The rank is based entirely upon a comparison of the frequency with which a species occurs, as compared to all others within the project area. It does not denote, necessarily, the abundance of that particular species in the Hawaiian Islands. The following symbols and explanations are employed:

- A ABUNDANT, generally the major or dominant species in a given area.
- C COMMON, generally distributed throughout a given area in large numbers.
- O OCCASIONAL, generally distributed through a major portion of a given area, but in small numbers.
- U UNCOMMON, observed uncommonly but more than 10 times in a given area.
- R RARE, observed 2 to 10 times in a given area.

7. Vegetation Units (Zones): the numbers correspond to those used in the checklist and explained in the text.

1. Psidium cattleianum forest
2. Melastoma-Dicranopteris scrubland
3. Metrosideros - Cibotium forest

4. Cecropia-Psidium cattleianum - Cibotium
forest
5. Tall Melochia - Cecropia - Michelia
closed forest
6. Melochia - Cecropia - Psidium cattle-
ianum scrub forest
7. Roadside

TABLE 2-4

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS FR	FR	1	2	3	4	5	6	7
PIERIDOPHYTA										
ANANTACEAE										
Pterocarya galomelanos (L.) Link	Gold fern	I								
ASPIDACEAE										
Cyrtosolus denticatus (Forst.) Chiba	Oak fern, downy wood-fern	I								
C. parasiticus (L.) Farwell	Oak fern, downy wood-fern	I								
Dryopteris cyathoides (Kaulf.) Kuntze	Kikavao	I								
D. brevidensiana		F								
BLECHNACEAE										
Selagin cyathoides Kaulf.	ANURAU	F								
DAVALLIACEAE										
Hepholobos cordifolia (L.) Presl	'Okupukupu, panoho	I								
H. exaltata (L.) Schott	'Okupukupu	I								
DICSONIACEAE										
Ciborium scandens Hook.	Hapu'u (f'l)	F								
C. splendens (Gaud.) Krauss	Hapu'u	F								
GLEICHENIACEAE										
Dicranopteris linearis (Burm.) Underw.	Uluka, snuhe	I								
HYMENOPHYLLACEAE										
Vandacechla sp.										
LINDSAYACEAE										
Sphenomeria chinensis (L.) Maxon	Pala'a, palapala'a	I								
LYCOPODIACEAE										
Lycopodium cernuum L.	Wakas - 'lolo	I								
OPHIOGLOSSACEAE										
Ophioglossum pendulum subsp. falcatum (Presl.) Clausen		F								
POLYPODIACEAE										
Microsorium scolopendria (Burm.) Copel.	Leua's	F								
Plaeopeltis thurberiana Kaulf.	Pakakaka, 'etaha - 'akolae	I								
PSILOTAGACEAE										
Psilotum nudum (L.) Beauv.	Moa, pipi	I								

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS PR	FR	RELATIVE ABUNDANCE															
				1	2	3	4	5	6	7									
MONOCOTYLEDONAE																			
CONVULSACEAE																			
<i>Convolvulaceae</i>	Monohono, honohono uai	X																	
<i>Convolvulaceae</i>																			
CYPERACEAE																			
<i>Cyperus leptostachyus</i> Nees & Meyen	'Uki, native sawgrass	X																	
<i>Cyperus brevifolius</i> (Rottb.) Hook.	Kyilaga, ki	X																	
<i>Cyperus matricoides</i> subsp. meyeri		X																	
<i>Cyperus</i> (Kunth) Koyama	'Uki	X																	
BIOSCOREACEAE																			
<i>Dioscorea alata</i> L.	UMI, YAM	P																	
<i>Dioscorea</i>	Pi'a, Pi'a	P																	
<i>Dioscorea</i>	D. pentaphylla L.																		
GRAMINEAE																			
<i>Andropogon virginicus</i> L.	Broomstick	X																	
<i>Andropogon sanguinalis</i> (L.) Holst.	Large crabgrass	X																	
<i>Dactyloctenium aegyptium</i> Beauv.	Molassesgrass	X																	
<i>Melinis minutiflora</i> Beauv.	Basketgrass, honohono	X																	
<i>Oplismenus hirtellus</i> (L.) Beauv.	- kukui	X																	
<i>Paspalum conjugatum</i> Berg.	Hilo grass	X																	
<i>Paspalum</i>	Pahua paspalum	X																	
<i>Paspalum</i>	Glenwood grass	X																	
<i>Pennisetum glaberrimum</i> (L.) Chase		X																	
<i>Sacciolepis indica</i> (L.) Chase		X																	
<i>Sporobolus africanus</i> (Poir.)	African dropseed	X																	
<i>Sporobolus</i>	Robyns & Tournefort	X																	
IRIDACEAE																			
<i>Sisyrinchium acre</i> Mann	Hau'u - la'ili	P																	
LILIACEAE																			
<i>Cordyline terminalis</i> (L.) Kuntz	Ii, ki	P																	
ORCHIDACEAE																			
<i>Arundina bambusaefolia</i> (Roxb.) Lindl.		X																	
<i>Spathoglottis plicata</i> Bl.		X																	
PALMAE																			
<i>Archontophoenix alexandriae</i> (F. Muell.)	Alexandria palm	X																	
<i>Archontophoenix</i>	H. Vendi. & Brude	X																	
PANDANACEAE																			
<i>Prescinetia arborea</i> Gaud.	Ie'ie	X																	
DICOTYLEDONAE																			
AMACARDIACEAE																			
<i>Madrifera indica</i> L.	Mango	X																	
<i>Rhus sandwicensis</i> Gray	Wenipuu	X																	
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	X																	

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS PR	YB	1	2	3	4	5	6	7	RELATIVE ABUNDANCE
APOCYNACEAE											
<i>Alvnia olivaceoalba</i> Grud.	Mulle	F					R				
ANALIACEAE											
<i>Hebrella</i> (rec. sciobus tree)		X				R					
BECONIACEAE											
<i>Baconia</i> sp.		X				R					
BIGNONIACEAE											
<i>Spathodea campanulata</i> Beauv.	African tulip tree	X				R					
CARYOPHYLLACEAE											
<i>Dymalis cordata</i> (L.) Willd. ex R. & S.	<i>Dymalis</i> , pipili	X									
GELASTRACEAE											
<i>Parrotia</i> <i>sandwicensis</i> Gray	<i>Olona</i> , <i>puu's olona</i>	F				R		R	U		
COMPOSITAE											
<i>Ageratum houstonianum</i> Hill.		X									
<i>Bidens pilosa</i> L.	Berber's tick, Spanish needle	X									
<i>Erechtites hieracifolia</i> (L.) Raf.	Flowered	X									
<i>Eupatorium cicutum</i> Nees	Spreading mist flower	X									
<i>Pluchea odorata</i> (L.) Cass.	Pluchea	X									
<i>Youngia japonica</i> (L.) DC.	Oriental hawkbeard	X									
CUCURBITACEAE											
<i>Cucumis dipsacicus</i> Ehrenb. ex Spreng	Wild cucumber	X									
YERVACEAE											
<i>Dioscorea</i> (series subsp. <i>sandwicensis</i>) (A. DC.) Fock.	Lama	F				R	U	O	U	A	O
EUPHORBIACEAE											
<i>Antidesma platyphyllum</i> Mann	Manc	F									
<i>Euphorbia prostrata</i> Ait.	Prostrate spurge	X									
<i>E. thymifolia</i> L.	Thyme-leaved spurge	X									
GESNERIACEAE											
<i>Cyrtandra lysiospala</i> (Gray) C. B. Clarke		F									
BANANELIACEAE											
<i>Buckleya populaga</i> R. Br.		X									
LILIACEAE											
<i>Colusa blussii</i> Barth.	Colusa	X									

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS PR	PH	RELATIVE ABUNDANCE						
				1	2	3	4	5	6	7
LAURACEAE										
<i>Persea americana</i> Mill	Avocado	X								R
LEGUMINOSAE										
<i>Albisia julibrissis</i> Durazz	Partridge Pea.	X								R
<i>Cassia leschenaultiana</i> DC.	leuki	X								X
<i>Desmodium canus</i> (Swal.) Scholz & Thell.	Spanish clover, 'ka'isi	X								C
<i>Mimosa pudica</i> var. <i>uniflora</i> (Duchess & Walp.) Griseb.	Sensitive plant	X								A
<i>Parkia</i> sp.		X								R
LOGANIACEAE										
<i>Buddleia asiatica</i> Lour.	Dogtail, Asiatic butterfly bush	X								R
LYTHRACEAE										
<i>Cuphea carthagenensis</i> (Jacq.) Macbride	Farward, Colombian cuphea	X								R
MAGNOLIACEAE										
<i>Nichelia champaca</i> L.	Mulana, Wong-lan	X								R
MELASTOMATACEAE										
<i>Melastoma malabathricum</i> L.	Malabar melastoma, Indian rhododendron	X								R
<i>Tecomyia bicolor</i> (Triana) Corn.		X								R
MENTHACEAE										
<i>Coriandrum ferrugineum</i> Gaud.	Huehua, hue'ie	Z								R
MORACEAE										
<i>Cannabis sativa</i> L.	Hemp	X								
<i>Cecropia peltata</i> Sandwark	Ironnet tree, suakuro	X								R
<i>Ficus microcarpa</i> L.f.	Chinese banyan	X								R
MYRICACEAE										
<i>Myrica faya</i> Ait.	Pitrecas	X								R
MYRSINACEAE										
<i>Artibeus humilis</i> Vahl	Shoeburton ardisia	X								R
<i>Myrsine leucosticta</i> A.DC.	Koles-lau-nyi	Z								R
MYRTACEAE										
<i>Eugenia jambos</i> L.	Rose apple	X								R
<i>Melaleuca leucadendra</i> (Stichm.) L.	Paper bark, calenut	X								R
<i>Metrosideros collina</i> subsp. <i>polymorpha</i> (Gaud.) Rock	'Ohi'a - lehua	Z								R

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS PR	FR	RELATIVE ABUNDANCE						
				1	2	3	4	5	6	7
MYRTACEAE, cont'd.										
*Podium cattileanum Sabine	Strawberry bush	X		A	C	O	C	R	O	A
P. guajava L.	Guava, kuya	X		O	U	U	R	U	A	
PASSIFLORACEAE										
Passiflora edulis f. flavicarpa Desf.	Yellow lillo'i	X								
PIPERACEAE										
Peperomia leptocarpa H & A	'Ava	I								
Piper methysticum Forst. f.		P								
PROTEACEAE										
Grevillea robusta A. Cunn.	Silk oak, silver oak	X								
ROSACEAE										
Rubus roseifolius Sm.	Roseleaf raspberry, thimbleberry	X		O	O	A	A	O	C	
RUBIACEAE										
Roripila laevis (Lam.) Griseb.	Buttonweed	X								
R. repens L.		X								
Raderia foetida L.	Maile pilou, maile-ka-kahiki	X		C	C	A	U	C	C	
Psychotria havaiensis (Gray) Fosb.	Kopiko	F		O	U	R				
var. havaiensis										
P. havaiensis var. hillebrandii (Rock) Fosb.	Kopiko	F		R	O	U	U	O		
RUTACEAE										
Flindersia brayleyana F. Muell.	Silkwood	X								
SAPOTACEAE										
Himnodia elengi L.	Elengi, psoda	X								
SCHROPHULARIACEAE										
Castilleja arvensis Schlecht & Cham.	Field Indian plant-brush	X								
SYRINGIACEAE										
Melochia umbellata (Houtt.) Steud.	Melochia	X		C	C	R	O	C	C	A
YILLIACEAE										
Heliconia popayanensis HBK.	White moho	I								
*P. cattileanum f. lucidum Desf. is here included under P. cattileanum. Both taxa are known to grow in the area, but most of the plants were sterile at the time of the survey.										

CHECK LIST OF PLANTS

SCIENTIFIC NAME	COMMON NAME	STATUS PR	FR	1	2	3	4	5	6	7
UIMACEAE										
<i>Trapa orientalis</i> (L.) Bl.	Cuspowder tree	X				R				
UMBELLIFERAE										
<i>Centella asiatica</i> (L.) Urban	Asiatic pennywort	X			O		U		R	
URTICACEAE										
<i>Pipturus brighamii</i> Scottab.		E		R		R			R	
VERBENACEAE										
<i>Lantana camara</i> L.	Lantana, Isiana	X		R		R	U		R	
<i>Stachytarphata jamaicensis</i> (L.) Vahl	Jamaica vervain	X			O	O				C

B. Fauna

A fauna survey was conducted on May 27, 28 and 29, 1978 to inventory the birds and mammals inhabiting the project site. A walk-through survey technique was used following the vegetation samplings for the botanical survey. Three days of field work revealed that only two major wildlife habitats could be recognized with species overlapping these habitats. As described in the vegetation description, the project area is a highly disturbed Metrosideros/Cibotium forest. The Metrosideros/Cibotium forest constitutes one major habitat type, while the urban and agricultural areas surrounding the project site constitute the second major habitat type.

Metrosideros-Cibotium Forest

The most commonly seen avian species in this habitat type are the melodious laughing thrush (Garrulax canorus), white-eye (Zosterops japonica) and cardinal (Cardinalis cardinalis). Housefinches (Carpodacus mexicanus frontalis) are also common.

No signs of mammalian wildlife were recorded during the field survey except for a ti plant that had been gnawed by rats (Rattus rattus, R. exulans hawaiiensis or R. norvegicus).

Adjacent Urban and Agricultural Areas

More species of avifauna were recorded in the areas adjacent to the project site. Common species include spotted munias (Lonchura punctulata), house sparrows (Passer domesticus), mynahs (Acridotheres tristis), barred doves (Geopelia striata) and lace-necked doves (Streptopelia chinensis). The white-eye, melodious laughing thrush and cardinal are common in areas of moderate to dense vegetation. An American golden plover (Pluvialis dominica fulva), uncommon for this time of year, was observed along the grassy shoulder of Volcano Road.

Dogs (Canis familiaris), cats (Felis catus) and mongooses (Herpestes auropunctatus) are common near residential areas. Macadamia nut orchards, sugar cane fields and residential areas around the project site suggest the presence of rats and mice (Mus musculus).

Critical Habitats And Environmental Impacts

The proposed Panaewa farm lots will destroy habitats for the predominantly exotic species discussed in the previous sections. Wildlife will be able to relocate to adjacent areas; however, this additional stress may result in territorial competition until a balance is achieved. The loss of

habitat is not anticipated to adversely impact any species. The wildlife species recorded from the project site are common in other areas of Hawaii.

Families are listed alphabetically under birds and mammals. Genera and species are arranged alphabetically. Taxonomy and nomenclature of birds follows that of the Hawaii Audubon Society (1975) and Berger (1972). Mammals were classified according to Kramer (1971) and Tomich (1969). For each species, the following information is provided in Tables 2-5 and 2-6:

1. Scientific name.
2. Vernacular or common name.
3. Status of the species. The following symbols are employed:
 - E endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.
 - I indigenous, i.e., native to the Hawaiian Islands, but also occurring naturally (without the aid of man) elsewhere.
 - X exotic, i.e., species of accidental or deliberate introduction after the western discovery of the islands.
 - P Polynesian introduction; it includes those species brought by the Polynesian immigrants previous to Captain Cook's discovery of the islands.
4. Endangered status.
 - * Listed as endangered by the State of Hawaii on the Island of Hawaii.

** Listed as endangered by the Department of the Interior, Fish and Wildlife Service.

Species listed as endangered are denoted by an asterisk(s) after the status of the species, such as "E*."

5. Relative abundance:

Abundant - plentiful; seen with great frequency throughout the entire study area.

Common - general; seen frequently over a wide area but not in exceedingly large numbers.

Occasional - limited; seen infrequently in the study area.

Rare - unusual; seldom seen, usually in very low numbers or merely passing through the study area.

6. Locality symbols used above each column represent general wildlife habitats in the project area.

M-C Metrosideros-Cibotium forest
U-A Adjacent urban and agricultural areas

TABLE 2-5
CHECKLIST OF BIRDS

SCIENTIFIC NAME	COMMON NAME	STATUS	RELATIVE ABUNDANCE	
			M-C	U-A
<u>CHARADRIIDAE</u>		I		R
<u>Pluvialis dominica fulva</u>	American golden plover			
<u>COLUMBIDAE</u>				
<u>Geopelia striata</u>	Barred dove	X		O
<u>Streptopelia chinensis</u>	Lace-necked dove	X	O	O
<u>FRINGILLIDAE</u>				
<u>Cardinalis cardinalis</u>	Cardinal	X	C	C
<u>Carpodacus mexicanus frontalis</u>	Housefinch, linnet	X	O	C
<u>Lonchura punctulata</u>	Spotted munia, rice-bird	X	O	C
<u>Passer domesticus</u>	House sparrow	X	O	C
<u>STURNIDAE</u>				
<u>Acridotheres tristis</u>	Common mynah	X		O
<u>TIMALIIDAE</u>				
<u>Garrulax canorus</u>	Melodious laughing thrush, Chinese thrush	X	C	C
<u>ZOSTEROPIDAE</u>				
<u>Zosterops japonica</u>	White-eye, mejiro	X	A	C

TABLE 2-6
CHECKLIST OF MAMMALS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>RELATIVE ABUNDANCE</u>	
			<u>M-C</u>	<u>U-A</u>
<u>CANIDAE</u>				
<u>Canis familiaris</u>	Dog	X		C
<u>FELIDAE</u>				
<u>Felis catus</u>	Cat	X		C
<u>MURIDAE</u>				
<u>Mus musculus domes-</u> <u>ticus</u>	Housemouse	X		C
<u>Rattus exulans</u> <u>hawaiiensis</u>	Hawaiian rat	E	R	O
<u>R. norvegicus</u>	Brown rat	X	R	O
<u>R. rattus</u>	Black rat	X	R	O
<u>VESPERTILIONIDAE</u>				
<u>Lasiurus cinereus</u> <u>semotus</u>	Hawaiian bat	E	*	
<u>VIVERRIDAE</u>				
<u>Herpestes auropunc-</u> <u>tatus</u>	Mongoose	X		C

* Not encountered but possibly present. For more information refer to the comment letter from the U. S. Fish and Wildlife Service in Section 12.

III. INFRASTRUCTURE

A. Utilities

1. Water

Water to the project area is transported from wells located approximately 3/4 mile north of the project area (Figure 1-4), and the site will be served by the County water system. The following water lines are located on streets near the project area:

Mamaki Street - 8 inch line

Awa Street - 6 inch line

Kalo Street - 6 and 8 inch lines

The water system will include a service lateral to each lot and fire protection for a maximum radius of 300 feet.

2. Power

Power to the project area is supplied by Hawaii Electric Light Company, Inc. (HELCO) from overhead lines along Mamaki Street through the site to Railroad Avenue, and along Volcano Road.

3. Gas

Gas is available at the project area through the use of storage tanks serviced by Isle Gas Division of Gasco, Inc., located at 945 Kalaniana'ole Avenue.

Gas supplies are adequate to serve the park. Installation of storage tanks will have to be coordinated and funded by the party requesting service. The consumer pays an annual rental charge for the tanks.

4. Liquid and Solid Waste

Liquid waste is disposed of through privately constructed cesspools approved by the State Department of Health. For additional information, please refer to the response letter to OEQC in Section 12.

Solid waste is disposed at the existing Hilo Sanitary Landfill, operated by the County of Hawaii. Residential refuse is disposed of by the individual lot owners.

B. Police Protection

The County of Hawaii is presently served by eight police stations comprising the County of Hawaii Police Department (County of Hawaii Data Book, 1977). Each judicial district has a police station, except for North and South Kona, which are both served by the Captain Cook station.

The project area is located at the boundary of the South Hilo and Puna Districts, and is serviced by the Hilo station located at 349 Kapiolani Street. Beat 17-A, which is part of Beat 17, includes the project area. One officer is assigned to Beats 17 and 17-A at all times. The most prevalent types of

crime in the area are residential burglaries and thefts. Table 2-7 presents offenses by districts. Response time to the area is less than three minutes.

C. Fire Protection

The project area is serviced by the Kawaiiani Fire Station. In case of fires, the Kawaiiani Station responds first, followed by the Central and Kaumana fire stations. The Keaau Fire Station responds to fires up to the macadamia nut farm along the southern boundary of the project site.

The Kawaiiani station has a 1,000 gallon triple combination pumper and a rescue wagon for first aid emergencies. The rescue wagon also supplements the County ambulance system. The Keaau station has a 750-gallon pumper, a 1,000-gallon tanker and a rescue van. Response time to the project site is approximately five minutes.

D. Health Services

Health services to Hilo and the project area is provided by Hilo Hospital, located at 1190 Waianuenu Avenue. The hospital contains 268 beds and provides general and long-term medical services. Visiting doctors from Honolulu provide clinics and consultation to the staff. There is a 24-hour emergency room with a physician on duty at all times.

TABLE 2-7

OFFENSES KNOWN TO POLICE & CLEARANCES
1977

CLASSIFICATION OF OFFENSES	Reported or Known	Unfounded	Actual	Cleared by Arrest or Otherwise	Offense by District							
					S. Hilo	N. Hilo	Puna	Hanalei	Koh. Koh.	S. Koh.	Kona	Ka'u
PART I CLASSES												
1a. Murder/Nonnegligent Manslaughter.....	9	-	9	6	3	1	2	-	-	1	2	-
b. Manslaughter by Negligence.....	30	18	12	9	12	-	1	3	-	6	7	1
2. Rape.....	18	4	14	9	7	-	-	1	3	3	4	-
3. Robbery.....	21	2	19	9	14	-	1	-	-	4	12	-
4. Aggravated Assault.....	62	2	60	38	34	2	8	2	-	4	12	-
5. Burglary.....	1,362	50	1,312	370	668	24	123	43	26	72	365	41
6a. Larceny - \$200 & over.....	525	32	493	65	201	1	52	20	5	54	172	20
b. Larceny - \$50 to \$200.....	774	32	742	128	358	10	57	24	10	65	213	37
c. Larceny - Under \$50.....	1,377	36	1,341	540	784	18	82	37	22	91	284	59
7. Auto Theft.....	204	28	176	61	87	2	17	1	3	10	81	3
8. Other Assaults.....	562	4	558	479	303	3	34	17	11	23	148	23
Part I Totals.....	4,944	208	4,736	1,714	2,471	61	377	149	80	329	1,293	184
PART II CLASSES												
9. Arson.....	62	-	62	9	44	-	3	2	-	-	9	4
10. Forgery/Counterfeiting.....	192	4	188	76	140	-	10	-	-	-	42	-
11. Fraud.....	338	3	335	222	228	1	3	4	12	10	79	1
12. Embezzlement.....	5	-	5	2	3	-	-	-	-	-	2	-
13. Receiving Stolen Property.....	24	1	23	20	4	3	-	-	3	2	10	2
14. Vandalism.....	868	24	844	176	475	11	57	23	39	47	154	62
15. Weapons.....	106	2	104	82	43	5	11	5	3	7	26	6
16. Prostitution.....	3	1	2	1	1	-	-	1	1	1	1	1
17. Sex Offenses.....	41	2	39	17	20	-	5	1	1	3	10	1
18. Narcotic Drug Laws.....	845	4	841	445	259	36	128	96	43	44	172	67
19. Gambling.....	64	1	63	48	57	-	4	1	-	1	-	-
20. Offenses vs. Family.....	10	2	8	8	6	-	1	-	1	-	2	-
21. Driving Under the Influence.....	188	21	167	167	83	11	3	5	7	23	43	13
22. Liquor Laws.....	25	-	25	22	8	2	2	-	2	1	9	1
23. Drunkenness.....	-	-	-	-	-	-	-	-	-	-	-	-
24. Disorderly Conduct.....	201	-	201	63	102	1	18	16	10	6	35	13
25. Vagrancy.....	2	1	1	1	-	1	-	-	-	-	-	1
26. All Other Offenses.....	1,072	25	1,047	746	517	22	98	69	40	63	193	70
27. Truancy.....	8	-	8	8	3	-	-	-	-	-	5	-
28. Curfew.....	208	5	203	202	140	-	15	8	3	4	31	7
29. Runaways.....	4,262	96	4,166	2,315	2,133	93	358	231	164	212	822	249
Part II Totals.....	9,206	304	8,902	4,029	4,604	154	735	380	244	541	2,115	433
GRAND TOTAL.....	9,206	304	8,902	4,029	4,604	154	735	380	244	541	2,115	433

*Includes clearances of cases from previous years.
**Not a criminal offense as of 1969.

E. Transportation

1. Air Travel

Regularly scheduled interisland air transportation is provided by Aloha Airlines and Hawaiian Airlines, as well as smaller carriers such as Royal Hawaiian Air Service and Air Hawaii. Other carriers also offer charters.

Direct mainland flights to and from General Lyman Field are provided by Continental Airlines, Northwest Airlines, United Airlines and Western Airlines.

Table 2-8 shows the number of passengers and pounds of cargo arriving and leaving General Lyman Field from 1960 to 1976.

2. Waterborne Travel

The project area is served by shipping lines using Hilo Harbor. Matson and Young Brothers are the primary interisland carriers. Foreign carriers infrequently use Hilo Harbor; the bulk of shipping activity in the State is handled at Honolulu. Freight and passenger traffic for Hilo Harbor from 1910 to 1975 is presented in Table 2-9. A more detailed breakdown in freight for Hilo Harbor, 1970 to 1975 is shown in Table 2-10. Farmers can utilize

TABLE 2-8

OVERSEAS AND INTERISLAND PASSENGER AND
CARGO FOR GENERAL LYMAN FIELD: 1960-1976

Airport and Year	Passengers		Cargo (1,000 lbs.)	
	In	Out	In	Out
<u>OVERSEAS</u>				
General Lyman Field: 4th Quarter, 1967	7,964 ^{1/}	8,416	1,139,480	1,522,227
1968	88,650 ^{1/}	127,232	1,408,368	9,398,652
1969	109,466 ^{1/}	195,317	1,935,733	7,939,558
1970	107,844 ^{1/}	180,861	978,859	12,257,674
1971	116,444 ^{1/}	196,984	3,179,024	12,236,626
1972	114,378	165,238	3,914,877	14,154,246
1973	123,759	147,207	4,101,980	20,820,765
1974	128,826	148,540	6,098,164	23,022,634
1975	101,162	126,139	5,965,346	22,310,866
1976	101,351	140,854	6,510,000	23,910,000
<u>INTERISLAND</u>				
General Lyman Field: 1960	145,226	120,034	5,077	3,714
1965	218,308	178,723	5,769	8,451
1970	299,042	280,399	10,318	5,586
1971	241,677	316,069	10,259	8,965
1972	444,106	421,844	11,358	14,210
1973	549,332	537,520	11,839	18,193
1974	556,607	543,301	12,097	19,126
1975	536,219	522,951	11,634	20,937
1976	568,601	518,642	12,300	22,007

^{1/} In addition to the inbound and outbound passengers, the number of thru passengers was: 18,793 in 1967; 105,731 in 1968; 36,846 in 1969; 17,177 in 1970; and 6,343 in 1971.

*SOURCE: State of Hawaii, Department of Transportation, Air Transportation Division, Statewide Airport Statistics, 1960-1976, and various reports; Department of Research and Development, records.

TABLE 2-9

FREIGHT AND PASSENGER TRAFFIC FOR HILO HARBOR: 1910 TO 1976

<u>YEAR</u>	<u>PASSENGERS</u>	<u>FREIGHT</u> <u>(1,000 short tons)</u>
1910	—	252.8
1920	41,524	316.2
1930	43,989	406.7
1940	46,604	528.3
1950	525	739.9
1960	4,047	807.8
1961	1,356	733.4
1962	1,157	835.2
1963	74	728.2
1964	1,492	874.5
1965	70	775.0
1966	4,000	835.0
1967	5,194	882.5
1968	9,880	991.1
1969	9,288	990.5
1970	4,457	1,141.2
1971	2,148	1,064.4
1972	658	1,108.1
1973	—	1,041.6
1974	9,600	928.6
1975	13,613	1,053.9
1976	1,313	995.5

SOURCE: U. S. Department of the Army, Corps of Engineers, Waterborne Commerce in the United States Calendar Year, Part 4 (Annual).

TABLE 2-10
FREIGHT TRAFFIC FOR HILO HARBOR
1970 TO 1976

Harbor and Year	Total	Foreign		Domestic		Internal Receipts
		Imports	Exports	Receipts	Shipments	
Hilo Harbor:						
1970	1,414,163	9,852	3,528	716,000	411,586	197
1971	1,064,384	38,492	5,381	630,368	389,865	278
1972	1,108,067	28,634	13,041	723,389	342,792	211
1973	1,041,647	21,297	33,209	602,743	383,749	249
1974	928,619	36,203	18	517,724	374,446	228
1975	1,053,879	29,605	45,542	621,063	357,390	279
1976	995,544	52,344	—	576,080	366,876	244

SOURCE: U. S. Department of the Army, Corps of Engineers, Waterborne Commerce in the United States, Calendar Year (annual), Part 4.

Young Brothers barge service or Matson Lines to transport their products to markets on Oahu or, in some cases, on the mainland.

3. Hawaii County Mass Transit System

The mass transit system is comprised of County-owned buses, called the Hele On System, which began service on December 15, 1975. The buses provide daily service between various districts and within Hilo and Kailua-Kona.

The project area is serviced by buses on the Pahoa-Hilo and Kau-Hilo routes. The bus may be flagged down along its route where safety conditions permit. Table 2-11 summarizes the ridership of the Hele On Bus System for the 1977 fiscal year.

F. Access

Access to the project area is provided via Volcano Road, Mamaki Street, Awa Street, Kalo Street and Railroad Avenue. All roadways are paved and in good condition except Railroad Avenue, which is an unimproved dirt road. The paved roads have 35 mile per hour speed limits except for Kanoelehua Avenue, which has a 55 mile per hour maximum speed limit and a 40 mile per hour minimum speed limit. Volcano Road/Kanoelehua Avenue is a divided four-lane highway between Hilo and Keaau.

TABLE 2-11
RIDERSHIP ON THE HELE ON BUS SYSTEM,
COUNTY OF HAWAII: FY 1977

Route	Total	July	Aug.	Sept.	Oct.	Nov.	Dec.
All Routes	358,356	30,937	30,863	30,010	31,401	27,616	28,928
Hilo System	172,534	14,731	14,540	14,841	14,782	12,907	15,029
Kona System	29,459	3,679	3,842	2,656	2,929	2,504	2,809
Kona-Hilo	33,087	2,776	2,761	2,710	3,313	2,835	2,580
Pauuilo-Hilo	18,196	1,722	1,539	1,665	1,663	1,590	1,467
Pahoa-Hilo	20,469	1,235	1,164	1,520	2,110	1,738	1,408
Waiohino-Hilo	10,775	621	720	720	807	686	562
MKB-Kohala	46,986	3,712	3,819	3,920	3,826	3,894	3,976
MKB-Honokaa	8,693	—	—	—	—	—	—
MKB-Honokaa	11,634	1,080	905	830	912	845	893
Waipio Shuttle	543	57	79	44	60	25	27
Specials, etc.	5,970	1,324	1,494	1,104	999	592	177

Route	Total	Jan.	Feb.	Mar.	Apr.	May	June
All Routes	358,356	29,002	28,875	33,010	29,633	29,240	28,831
Hilo System	172,534	14,506	14,609	15,324	13,655	13,514	14,096
Kona System	29,459	1,788	1,880	2,053	1,883	1,806	1,630
Kona-Hilo	33,087	2,783	2,551	2,801	2,825	2,749	2,403
Pauuilo-Hilo	18,196	1,206	1,376	1,642	1,436	1,430	1,460
Pahoa-Hilo	20,469	1,893	1,815	2,183	1,834	1,783	1,786
Waiohino-Hilo	10,775	500	499	1,743	1,509	1,241	1,167
MKB-Kohala	46,986	3,956	3,667	4,390	4,040	4,060	3,726
MKB-Honokaa	8,693	1,344	1,466	1,618	1,431	1,506	1,328
MKB-Honokaa	11,634	975	877	1,189	982	1,102	1,044
Waipio Shuttle	543	51	49	52	24	34	41
Specials, etc.	5,970	—	86	15	14	15	150

SOURCE: County of Hawaii, Mass Transportation Agency records.

G. Commercial Communication

Communications media serving the project area include postal, radio, television, newspaper and telephone service. Post offices close to the project area are the Keaau Post Office and the Hilo Airport Post Office.

Commercial broadcasting radio stations servicing the area are radio stations KHLO, KIPA and KPUA. Honolulu-based radio stations are also heard; however, the quality of the broadcast depends on the time of day and the receiver used.

Television stations broadcasting from Honolulu and received in Hilo include KGMB-TV, KHON-TV, KHET and KITV. KIKU-TV, the fourth major TV station broadcasting from Honolulu, can be seen in Hilo through cable hookups. Cable television services to South Hilo are provided by COMTEC, Inc.

The Hawaii Tribune Herald is the island's only daily newspaper with a 1976 daily circulation of 16,386 and a Sunday circulation of 17,361 (DPED, State of Hawaii Data Book, 1977). Bi-weekly, tri-weekly and monthly publications include Hawaii Up-Close, the Mercury and West Hawaii Today. These publications are available to the public.

Telephone service to the areas adjacent to the project area is provided through Hawaiian Telephone Company's Kawaihau Office. Listed below are data compiled in March, 1978:

Total Stations:	Business	316
	Residence	5,934
Main Stations:	Business	162
	Residence	3,564
Total Capacity of Office:		6,600 lines

Additional capacity and equipment will be provided by Hawaiian Telephone as the demand necessitates.

Basic telephone rates for the island of Hawaii are as follows:

	<u>Business</u>	<u>Residence</u>
One Party	\$20.90	\$10.20
Two Party	\$17.05	\$ 8.55
Four Party	\$13.75	\$ 7.35

IV. ECONOMIC CHARACTERISTICS

In 1977, the island of Hawaii led all counties in total revenues from diversified crops, with \$27.9 million or 53% of the State's total of \$52.8 million. That year sales were higher for vegetables, fruits, macadamia nuts, field crops and horticultural specialties (First Hawaiian Bank, 1978). Sales were down only for coffee, due to steadily declining world prices for this commodity.

In 1978, sales from diversified crops increased to \$34.1 million (First Hawaiian Bank, 1979). Total farm revenues on the Big Island increased by \$26.5 million, to \$54.4 million. The higher diversified crop sales were accounted for mainly by macadamia nuts, flowers and nursery products, vegetables, and papaya. Coffee receipts were down 33.9% due to smaller acreage harvested, poorer yields and lower prices.

The rapidly growing flower and nursery product sector of diversified agriculture surpassed vegetables in 1978 to become the State's third-ranking diversified product in terms of receipts. The increase was accounted for by huge gains in exports of anthuriums and potted foliage.

This was the second consecutive year of substantial gains for vegetable crops, with a 14.6% increase over 1977 sales. However, local production is not keeping pace with increasing local consumption.

The macadamia industry achieved its first over-20-million pound year in 1978. Despite drought, rainstorms, and diminished blossoms due to wind and rain, the record year was made possible by an additional 3,000 acres that reached the bearing stage last year. Revenues increased 40% over the year before, due to a sharp increase in prices.

The papaya industry produced a record crop of 54.6 million pounds in 1978, however this is expected to decrease

to about 38 million pounds in 1979 due to the discovery of a new disease which destroyed 300 acres of trees in the Puna area.

land use plans 3

SECTION 3

RELATIONSHIP OF THE PROPOSED PROJECT TO LAND USE PLANS,
POLICIES AND CONTROLS FOR THE AFFECTED AREA

I. GENERAL

The use of the Panaewa project site for an agricultural park is permitted within the limits of existing land use controls. The applicable controls include:

STATE LAND USE DISTRICT - Agriculture

COUNTY OF HAWAII GENERAL PLAN - Orchards

ZONING - A-3a

The County of Hawaii General Plan, implemented in 1971, designates the project site as Orchards, which include agricultural lands that are rocky but support productive crops such as macadamia nuts, papaya and citrus fruits. The site is zoned (A-3a) agriculture, with a three-acre minimum lot size. Thus, the two 2-acre lots proposed will require a zoning variance. The zoning permits one single family dwelling unit per lot.

A new County playground has just been completed at the north end of Mamaki Street on a 5-acre parcel of land. Approximately 5.2 acres more will be developed in the second increment. The first increment included:

1. Approximately 800 feet of a 24 foot-wide access road with grassed swales, along the

project site boundary from the east end of Mamaki Street to roughly the middle of the site.

2. A parking area for approximately 24 vehicles.
3. One regulation "Little League" baseball field.
4. One regulation football field.
5. Two tennis courts and one basketball court.
6. One restroom facility which will utilize an aerobic treatment system, followed by an infiltration well, capable of handling 2,000 gpd of sewage. This volume assumes a maximum use of 400 persons x 5 gallons of sewage/person/day, or an expected maximum load of 2,000 gallons of sewage per day.
7. A 94 x 30-foot, fenced tot lot play area.

Implementation of the second increment of the project is dependent on securing additional funds. The second increment will include:

1. A combination pavilion/community hall.
2. A 1/2 mile pedestrian trail system through a typical wet forest. Included would be nature information markers, as well as picnic sites.

3. Open picnic area and non-designated grassy areas for passive recreation.

Surrounding the playground, north of the proposed agricultural park, are the Panaewa House Lots. There are 96 lots from 1.1 to 2.8 acres in size on a total of 297 acres (Neighbor Island Consultants, 1976). In July, 1976 there were 103 single family dwellings on the lots. Assuming 3.5 persons per dwelling, the area contained a population of approximately 360 persons, or 1.2 persons per acre.

This density is typical of a rural residential area. A number of the homeowners have small flower farms, such as anthuriums and other saleable flowers. Other uses include guava and macadamia nut orchards. North of the Panaewa House Lots are the Panaewa Farm Lots, consisting of 25 lots (2nd series) approximately 10 acres in size.

To the west of the site is a forest reserve and the Hale Nani Police Academy, both along Volcano Road. There is also a University of Hawaii Agricultural Experiment Station about 1.9 to the west on Stainback Highway. To the east are undeveloped Department of Hawaiian Home Lands (Panaewa House and Farm Lots). There are macadamia nut orchards and sugar cane fields to the south.

II. HAWAII STATE PLAN

The new State Plan contains several policies which relate to agriculture. Among those relating directly

or indirectly to diversified agriculture are the following:

Objective:

Section 7(a)(2): Continued growth and development of diversified agriculture throughout the State.

Policies:

Section 7(b)(4): Support research and development activities that provide greater efficiency and economic productivity in agriculture.

Section 7(b)(6): Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.

Section 7(b)(8): Expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, feed grains, forestry, food crops, aquaculture and other potential enterprises.

Section 7(b)(10): Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency.

The proposed project is in compliance with these policies and directly supports Sections 7(b)(6) and 7(b)(8). In addition, there are several Priority Directions which may be pertinent to the proposed project. For further information in this regard, please note the letter to the Department of Planning and Economic Development in Section 12.

environmental impacts 4

SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES TO MINIMIZE ADVERSE IMPACTS

This section will summarize and discuss the probable impacts of the proposed action on the environment.

I. INTRODUCTION

The proposed project will generate primary and secondary environmental impacts. Primary impacts are those resulting directly from construction activities and from the agricultural uses of the proposed parcel of land. Secondary environmental impacts are those which are anticipated over the duration of the agricultural park use and which may include potential use conflicts and indirect benefits arising from the proposed action.

II. PRIMARY IMPACTS

A. Short-term Impacts

Short-term impacts, beneficial and adverse, generally result from construction-related activities. Consequently, these impacts are of short duration and should not last longer than the duration of the construction.

1. Economic

During the construction of the agricultural park, which will require land clearing, installation of water transmission lines and roads

for internal circulation, there will be infusion of cash into the local economy. This will be a short-term, positive impact for the local economy.

2. Air Quality

During construction of the water transmission system, internal roads, site clearing and construction of structures, there may be some dust generation. This problem, however, is not anticipated to be significant since the soil type at the site is predominantly lava, and Keaukaha and Papai series should not be subject to significant wind and water erosion. If dust is a significant problem, it will be mitigated in the field by the use of appropriate water sprinkling methods. The relatively high rainfall in the project area will also probably prevent serious dust problems from arising during construction activities.

Exhaust emissions from construction equipment are not expected to significantly affect the air quality of the area. The prevailing winds in the area should help to quickly disperse any exhaust gas concentrations.

Burning may be used to rid the area of vegetative material after the land is cleared.

Any burning would require a permit from the Fire Department and the Department of Health.

3. Water Quality

The soil type on the site is mostly a mixture of lava and soil; also, since there are no streams located within the project site, significant erosion and sedimentation problems are not expected.

4. Traffic

For additional information, please refer to the response letter to OEQC in Section 12.

5. Noise

During the site preparation and construction of buildings, site clearing and water line installation, an increase of ambient noise is inevitable. Noise levels generated by construction machinery are presented in Figure 4-1.

The contractor will insure that construction equipment is in proper condition and will limit the hours of construction. The increase in noise will be temporary.

Ambient noise readings were recorded at the project site, using a Bruel and Kjaer Sound Level Noise Meter. The results of the noise survey (Table 4-1) show that the ambient noise levels are, in most cases, below 50 dBA. Peak

FIGURE 4-1
CONSTRUCTION EQUIPMENT NOISE RANGES

		NOISE LEVEL (dba) AT 50 FT					
		60	70	80	90	100	110
EARTH MOVING	COMPACTERS (ROLLERS)		H				
	FRONT LOADERS						
	BACKHOES						
	TRACTORS						
	SCRAPERS, GRADERS						
	PAVERS				H		
	TRUCKS						
MATERIALS HANDLING	CONCRETE MIXERS						
	CONCRETE PUMPS			H			
	CRANES (MOVABLE)						
	CRANES (DERRICK)				H		
STATIONARY	PUMPS	H					
	GENERATORS						
	COMPRESSORS						
IMPACT EQUIPMENT	PNEUMATIC WRENCHES						
	JACK HAMMERS AND ROCK DRILLS						
	PILE DRIVERS (PEAKS)						
OTHER	VIBRATOR						
	SAWS						

Note: Based on Limited Available Data Samples

Source: Noise From Construction Equipment and Operations Building Equipment, and Home Appliances, EPA, 1971

TABLE 4-1

ENVIRONMENT IMPACT STUDY CORPORATION

AMBIENT NOISE SURVEY

PROJECT # _____

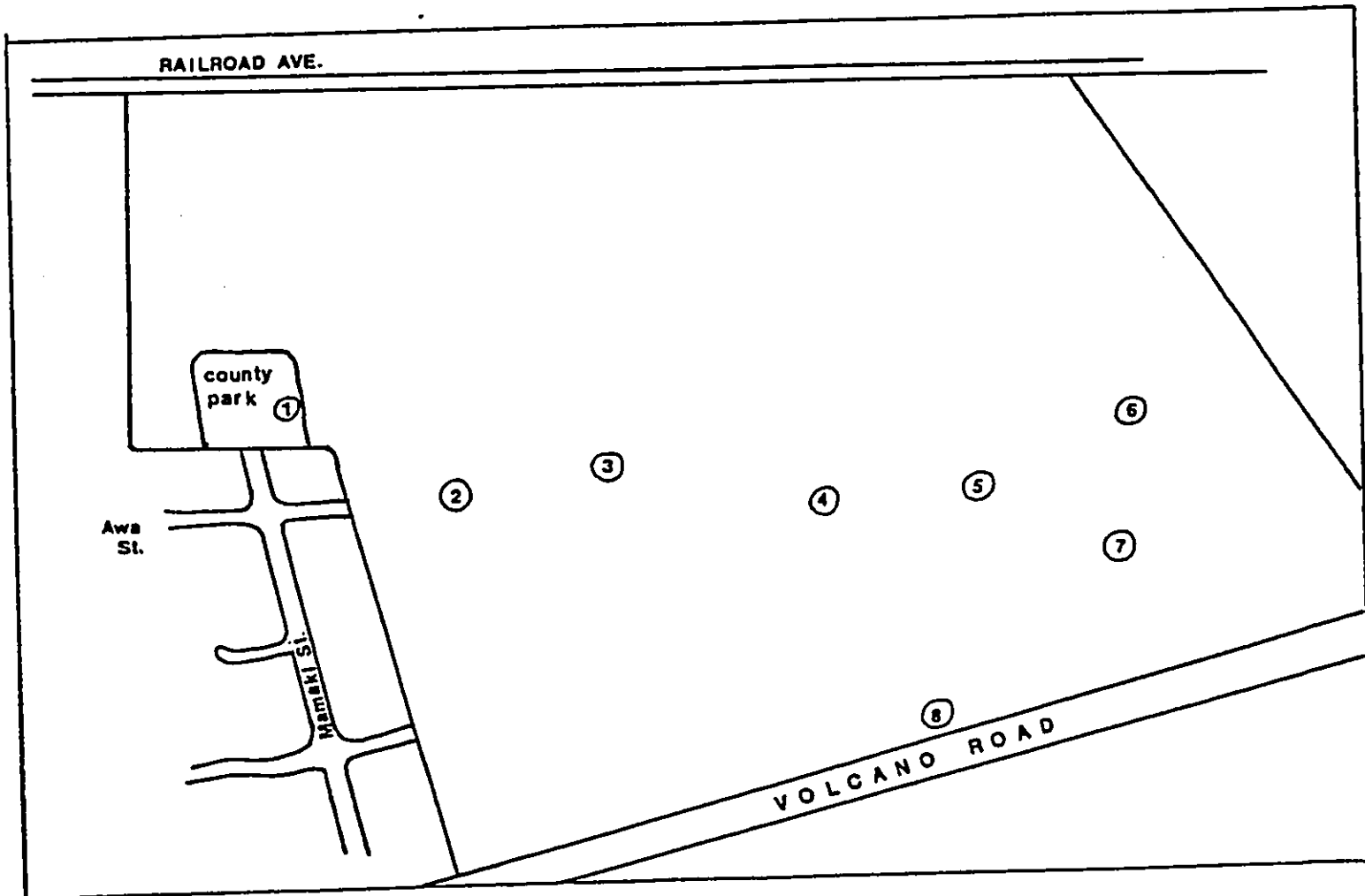
DATE 5/27/78

LOCATION Panaewa Farm Lots

INITIAL _____

STATION	dBA	TIME	DURATION	COMMENT
1	30-35	9:50 a.m.	2 min.	Birds, very still & quiet.
2	40-42	10:30 a.m.	2 min.	Birds, rain, slight traffic
3	37-40	10:45 a.m.	2 min.	Birds, traffic, raindrops *
4	45-47	11:10 a.m.	2 min.	Birds, traffic, rain
5	38-42	11:35 a.m.	2 min.	Birds, traffic, no rain
6	35-38	12:10 p.m.	2 min.	Birds, traffic, no rain
7	42-48	2:45 p.m.	2 min.	Traffic, birds, no rain
8	72-78	4:05 p.m.	2 min.	Passing cars, directly in **
8	50-56	4:08 p.m.	2 min.	No passing cars but could hear cars going toward Keeau.

DIAGRAM



* (under trees)
 ** front, wet roads.

TABLE 4-1 (cont'd)
 ENVIRONMENT IMPACT STUDY CORPORATION
AMBIENT NOISE SURVEY

PROJECT # _____

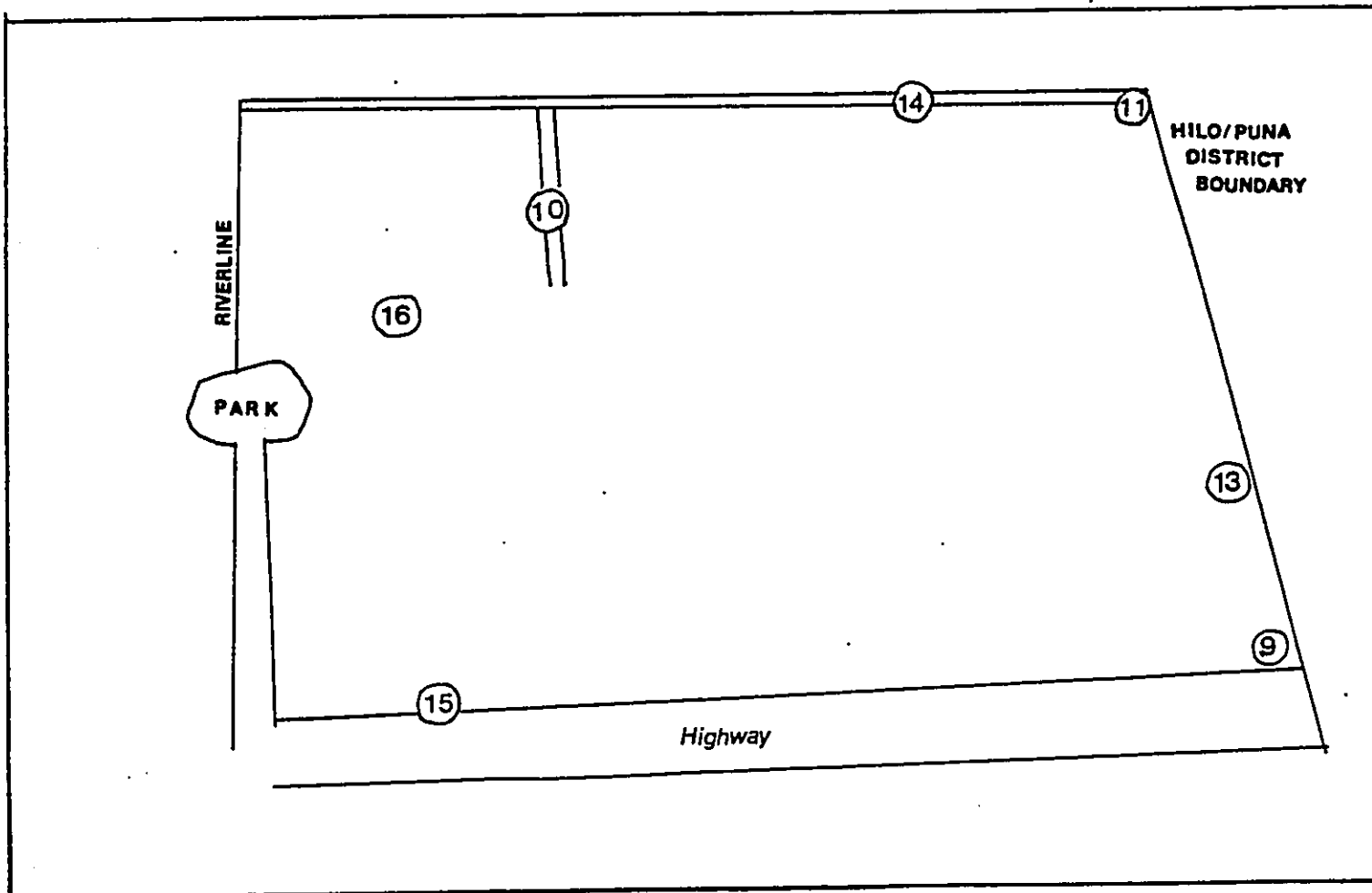
DATE 5-28-78

LOCATION Panaewa Farm Lots

INITIAL gs

STATION	dBA	TIME	DURATION	COMMENT
9	72-74	9:10 a.m.	2 min.	Passing cars - dry road
10	30-34	9:50 a.m.	2 min.	Birds, flies, very still
11	30-32	10:20 a.m.	2 min.	Birds, flies, very still
12	30-35	10:30 a.m.	2 min.	Birds, wind in trees and *
13	42-45	10:45 a.m.	2 min.	Wind in sugar & trees, birds
14	30-34	11:35 a.m.	2 min.	Wind in trees, birds
15	72-75	12:00 p.m.	2 min.	Passing cars - dry road
16	35-42	2:45 p.m.	2 min.	Birds, wind

DIAGRAM



* sugar cane.

levels reach 75 dBA near the roadsides. These noise levels are not considered excessive for an agricultural area.

6. Biological

Vegetation in the project area is not considered rare or endangered by State or Federal agencies. The majority of species are introduced and significant impacts on existing botanical communities are not expected.

Terrestrial fauna in the project area include introduced species associated with urbanized areas. The site does not contain any significant wildlife habitats for any endangered species of birds and mammals.

During construction, fauna in the immediate vicinity of the construction activities may relocate into adjacent areas, but would be able to return to the site upon completion of construction. Adverse impacts on faunal communities are not expected from the proposed action.

7. Archeological

No archeological sites were observed during the biological reconnaissance of the project area. The Historic Sites Section Director, Division of State Parks, has determined that

there are no known historical sites within the project area.

B. Long-term Impacts

1. Economic

The long-term economic impact from the proposed project is difficult to ascertain at this time. Since the exact number of lots to be distributed to any given use is unknown, and since the amount of economic return will depend in part on this, the economic return cannot be predicted at this time. However, it is the intent of the proposed action to provide land and the necessary infrastructure to aid in the success of individual enterprise.

2. Air Quality

The long-term environmental impacts on the ambient air quality are not anticipated to be significant. The use of pesticides and herbicides in the area should not present a significant problem if applied according to prescribed methods. Each of the farmers will use EPA approved herbicides and pesticides and will be required to take courses and receive instructions before being granted a permit to use the EPA approved herbicides and pesticides.

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As a practical matter, these chemical agents are expensive and, therefore, most of the farmers will use the chemicals judiciously. It is also anticipated that the use of windbreaks and a buffer strip around the project area will be a means of mitigating any fugitive chemicals and/or dust from leaving the project area.

Certain agricultural crops may require the burning of excess vegetation. For example, decaying vegetative matter poses potential disease problems to young guava and macadamia nut trees and burning is a recommended procedure for field preparation. Fallen leaves must also be disposed of in a macadamia orchard, to allow for optimum harvesting. Burning is one method for this disposal. Any burning would require a permit from the Fire Department and the Department of Health.

3. Water Quality

a. Surface Water

The absence of streams and/or ponds within or near the project site precludes adverse impacts on surface water quality.

b. Ground Water

The use of fertilizers and the use of cesspools for sewage disposal on the

project site and on the surrounding Panaewa Farm Lots may eventually have some impact on groundwater resources in the area. However, based on available data, there has been no adverse impact on ground water from existing land uses. As a precautionary measure, the Hawaii County Department of Water Supply plans to begin a regular water quality monitoring program for Panaewa Wells in 1980 (Kawasaka, 1979). The well water would be sampled every three months, for nitrates, TDS, chlorides, and coliforms. For additional information, please refer to the response letter to the Department of Health in Section 12.

4. Noise

It is not anticipated that noise will be a significant impact on the adjacent areas. There are no schools, churches, or hospitals located adjacent to the project area.

5. Biological

The project area is not considered to be a sensitive wildlife habitat area, nor does the site contain any endangered species of plants or animals. Therefore, long-term adverse impacts are not anticipated from the proposed action.

The use of the project area for agricultural activities may present potential vector problems. These vectors would include mice, rats, flies and mongoose. Vector problems can usually be controlled through trapping, and more importantly, through the use of sanitary agricultural practices. It will be to the benefit of the individual farmer to practice sanitary agricultural techniques, not only to keep down the vectors, but to increase his yields by preventing crop damage by these vectors.

6. Archeological

The absence of known archeological and/or historical sites within the project area preclude any environmental impacts. If any unknown sites are encountered during construction, the State Historic Preservation Officer will be notified.

7. Infrastructure

(a) Electricity and Telephone

Electrical and telephone services are adequate to serve the park. The Big Island is presently the location of several alternative energy projects, including ocean thermal energy conversion (OTEC), geothermal power, and biomass sources.

It is anticipated they will replace greater amounts of fuel oil in coming years and "it is highly possible that (the utility) will never build another oil-fired generator" (First Hawaiian Bank, 1979).

The State will fund the installation of the pole lines on-site, which are jointly used by both services. The only initial cost to the tenants will be the normal installation charge for new telephone service. However, if there is more than 320 feet from the last house serviced to the next consumer requesting service, a service charge will be assessed by Hawaiian Telephone company. This charge will vary according to the amount of new line required to be installed.

Electrical use is anticipated to be minimal for the majority of lots within the park, since use would primarily be limited to farm residences. It is anticipated that the two accessory use lots and the U.H. lot would use relatively more electricity than the other lots. A quantitative estimate of electrical use is not available at the present time.

(b) Water

The total amount of water required by the Agricultural Park cannot be projected at this time because the exact mix of proposed uses is unknown. Since the project area lies within a heavy rainfall area, minimal amounts of water will be required for the various types of agricultural crops to be cultivated. Whatever the project water requirements will be, as determined in later studies, the availability of water is excellent, and there should be no problem in providing water for the intended uses of the project. The sustainable capacity of Panaewa Wells is 5 mgd, while consumption presently averages 3.5 mgd.

The Hawaii Department of Water Supply will review the project plans when finalized. Water services will be granted when the water system is dedicated to the County. Consumers would then pay the prevailing water rates for the area. The proposed water system will also make it possible for the DWS to improve service to customers in the adjoining Panaewa Farm and House Lots.

(c) Solid Waste

Agricultural solid waste from the project area will have to be removed by the tenants to the sanitary landfills located within the vicinity. There are no problems anticipated in disposal of the agricultural solid waste. The exact amount of solid waste to be generated is unknown because the ultimate mix of proposed uses is unknown at this time.

(d) Liquid Waste

Since the area does not have a centralized waste-water treatment plant, liquid waste will have to be disposed of on an individual basis. This will include the use of cesspools or other methods approved by the Department of Health. These facilities would be paid for by each tenant.

The University of Hawaii may require more sophisticated facilities depending on the type of activities they have planned. For additional information, please refer to the response letter to the U. S. Geological Survey in Section 12.

8. Drainage

Runoff water should percolate naturally. However, if final design requires drainage facilities, drywell sumps will be constructed at strategic locations.

9. Security and Emergency

Security should not present a major problem to the project area. Each individual farmer would be responsible for providing security for his farm equipment and his parcel of land. In the event that emergency services are required, excellent facilities are located within five miles from the project site at Hilo Hospital. Police and fire protection are also available from the Hilo area.

10. Traffic

The impact of additional traffic to this area should be very minimal and should not present any long-term traffic problems.

The only improved access into the agricultural park will be from the extension of Awa Street (Road B), to provide privacy and better security for the tenants. Although Railroad Avenue is presently an unimproved dirt road, Road A will connect with it to provide

an additional outlet from the subdivision for safety purposes.

A connection to Volcano Road may be constructed at a later date when and if the traffic volume within the subdivision dictates the need for an additional access. The right-of-way for Road A is set at 60 feet so that no condemnation action will be required in the event that it does become a major connector between Volcano Road and Railroad Avenues. For additional information, please refer to the response letter to the State Department of Transportation in Section 12.

11. Social

The proposed project will have no significant impact on the nearby community. Land use in the vicinity of the project is compatible, with many small farming operations and a rural atmosphere.

12. Agriculture

The project will make farm lots available to both experienced and new farmers. It will aid in promoting diversified agriculture in the State, and will not negatively impact nearby farming operations. Water is currently available

and there is ready access to a large market, the Hilo area, and a major shipping center, Hilo Harbor.

III. SECONDARY IMPACTS

A. Land Use

Use of this area as an agricultural park will preclude other actions for the land. Actions, therefore, incompatible with the intent of the agricultural park will not be permitted. Farm dwellings are permitted on agricultural park lots, however.

B. Educational Opportunity

The proposed agricultural park will provide an educational opportunity in the use of a portion of the park by the University of Hawaii at Hilo, including the community college. The site will offer practical experience for the students majoring in agriculture.

adverse environmental effects 5

SECTION 5

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS
WHICH CANNOT BE AVOIDED

This section will briefly discuss probable adverse environmental impacts and mitigative measures, when applicable, and the rationale for proceeding with a proposed action, notwithstanding unavoidable effects.

I. PRIMARY SHORT-TERM IMPACTS

A. Probable Impacts and Mitigative Measures

During the initial construction phase of the agricultural park, a temporary increase in the existing noise level can be expected. This impact will be of short duration, lasting only for the construction period, and the noise level can be reduced by the contractor by insuring proper functioning of mufflers on all equipment.

The grubbing and clearing of the existing vegetation may result in dust problems. If dust becomes a serious problem, it can be mitigated to a large extent by water sprinkling. However, it is anticipated that dust will not be a significant problem due to the relatively high rainfall in the project area.

Combustion emissions from construction vehicles are inevitable; however, the level of emissions should

be insignificant and is not anticipated to result in adverse environmental impacts.

B. Reasons for Proceeding

The probable short-term adverse impacts encountered during the construction phase of the proposed agricultural park are minor and can be controlled by using acceptable mitigative measures.

II. PRIMARY LONG-TERM IMPACTS

A. Probable Impacts and Mitigative Measures

Clearing and grubbing of the existing vegetation will be required for the implementation of the proposed agricultural park. The removal of the vegetation will have an impact on the existing wildlife. However, the proposed project site does not contain endangered species of plants and/or animals, nor does it contain sensitive wildlife habitats. The existing wildlife will undoubtedly relocate to the adjacent areas and, in some instances, return to the project site for food and shelter after clearing activities. Impacts to ground water quality may eventually occur.

Adverse impacts to emergency, security, electrical, sewage and refuse disposal are not anticipated. Existing physical and biological aspects of this site should not be significantly affected by the proposed action.

B. Reasons for Proceeding

Clearing of the existing vegetation will not significantly impact the existing wildlife. The project site does not contain endangered species of plants. Ground water quality will be monitored on a regular basis.

The proposed development will require the commitment of funds; however, the returns on the investment should be beneficial. Establishing an agricultural park is in keeping with the overall State goal of providing for a diversified economic base. Not only will the individual farmers benefit from the implementation of the project, but the students enrolled in agricultural programs at the University of Hawaii, at Hilo, will also benefit from the practical experience gained from having participated in an agricultural farm laboratory.

III. SECONDARY IMPACTS

A. Probable Impacts and Mitigative Measures

Use of this parcel of land for agricultural purposes precludes uses incompatible with that of an agricultural park.

B. Reasons for Proceeding

The long-term beneficial impacts of securing this parcel of land for agricultural purposes would be realized for many generations. The proposed action

would set aside this land for the people of the State for agricultural purposes and will assist in providing for the diversified economic base on the Island of Hawaii.

alternatives 6

SECTION 6

ALTERNATIVES TO THE PROPOSED ACTION

This section will discuss the alternatives to the proposed action which have been considered.

I. NO ACTION

A no action alternative would not accomplish the objectives of the Department of Land and Natural Resources. These objectives are to provide land for diversified agriculture, to provide land for practical experience in the areas of agriculture, and to provide an opportunity for the small farmers.

II. ALTERNATIVE SITES

Alternative agricultural park sites were not evaluated because this parcel of land is available for immediate use as an agricultural park. Furthermore, development of this parcel is desirable since the cost of land acquisition is not a factor, and since the infrastructure items needed to support an agricultural park are presently available. In addition, the parcel is located only five miles from Hilo, and thus is in close proximity to markets in Hilo and to shipping facilities in Hilo Harbor.

III. ALTERNATIVE USES AND DEVELOPMENT CONCEPTS

The project site is designated Agriculture according to the State Land Use District boundary, Orchard according

to the General Plan for the County of Hawaii, and zoned A-3a. Alternative uses of the land other than those compatible with the land use designations would require changes in the State land use designation as well as County General Plan designation and zoning.

An adjacent area is designated for a County playground (10.2 acres), and Phase I was recently completed. Phase I construction included parking, baseball field, football field, tennis courts and one basketball court. In addition, restroom facilities, a children's play area, a pedestrian trail system, picnic areas and a combination pavilion/community hall are in the future plans. The proposed project should not conflict with the County recreational complex.

resource commitment 7

SECTION 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section considers the commitment of resources that is made once a project is implemented.

State funds, labor, construction building materials, and fuel will be committed to the project. Additional manpower, fuel, fertilizer and pesticides will be utilized by the individual farmers for cultivation of the agricultural products. The exact amount of fertilizer, pesticides and fuel which will be required by the individual farmers cannot be quantified at the present time.

short term uses 8
long term productivity

SECTION 8

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF
MAN'S ENVIRONMENT AND MAINTENANCE AND
ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section will include a brief discussion of the extent to which the proposed action involves trade-offs between short-term environmental gains at the expense of long-term losses, or vice-versa, and a discussion of the extent to which the proposed action forecloses future options, narrows the range of beneficial uses of the environment, or poses long-term risks to health or safety.

The proposed project, the development of an agricultural park, has considered the environmental attributes of the area, evaluated existing infrastructural items, and the farmers' desire for additional agricultural lands. The proposed actions, when implemented, will enhance the economic resources of this area. The proposed action will enable small farmers to obtain land for their agricultural endeavors, and thereby will strengthen the diversified economic base of the project area. Providing land for the small farmers will enable them to have the opportunity to participate in the overall agricultural efforts of the State.

The proposed project will not involve trade-offs between short-term environmental gains at the expense of long-term losses, foreclose future uses of the area, narrow the range of beneficial use of the environment, or propose long-term risks to health and safety.

government policy 9
offsetting adverse effects

SECTION 9

AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS
OF GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE
ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

As indicated in Section 4, Anticipated Environmental Impacts and Mitigative Measures to Minimize Adverse Impacts, most of the adverse impacts are short-term and related to construction activities. All adverse impacts anticipated from implementation of the proposed project are insignificant in comparison to the benefits to be gained. The development of an agricultural park in this area will be in accordance with the goals and objectives presented in the objective of the Agricultural Park set forth in Chapter C, 171, Part V of the Hawaii Revised Statutes, to strengthen diversified agriculture in Hawaii by a plan that "combines and concentrates in a common location agricultural activities for the purpose of production and distribution of the economy."

approvals 10

SECTION 10

LIST OF NECESSARY APPROVALS

The development of the Agricultural Park at Panaewa will require various governmental approvals. A list of approvals is as follows:

STATE OF HAWAII

1. Department of Health [DOH] - Sewage disposal and permit for agriculture
2. Department of Transportation [DOT] - All access and utility connections to the main highways will require the approval of the Highways Division, DOT.
3. Department of Land and Natural Resources [DLNR] - Approval of the agricultural park plan.

COUNTY OF HAWAII

1. Planning Department - Preliminary subdivision approval (including special permit for two 2-acre parcels)
2. Department of Public Works - grading permit, grubbing permit, and building permit
3. Department of Water Supply - approval of construction plans

**notice of preparation
consultation period 11**

SECTION 11

ORGANIZATIONS AND PERSONS CONSULTED
DURING THE NOP REVIEW PROCESS

The following list includes those agencies and organization who were consulted in the NOP review process. Letters of comment were received from those marked by an asterisk.

STATE

Department of Agriculture

Department of Land and Natural Resources,
Land Management Division

* University of Hawaii

COUNTY

Hawaii County Planning Commission

OTHER

Hilo Engineering

UNIVERSITY OF HAWAII

VICE-PRESIDENT FOR ADMINISTRATION

October 22, 1979

MEMORANDUM

TO: Mr. Susumu Ono, Chairman
Board of Land and Natural Resources

ATTENTION: Mr. Harold Sakai

SUBJECT: Panaewa Agricultural Park EIS Comments

Based on the review of the Notice of Preparation for the Panaewa Agricultural Park EIS, the following comments are offered.

The draft EIS has covered the pertinent points, however, it is suggested that the following points be more completely developed:

- Page 1-5: It would be helpful to potential lessees to know if the State expects all capital improvements made by the State to be repaid by the lessees.
- Page 2-37: The availability of water, power and gas services is discussed but no mention is made as to the adequacy of the supplies. Discussion should include a statement as to whether there are adequate supplies to service the proposed agricultural park.

Mr. Susumu Ono
Page Two
October 22, 1979

Page 4-11: Reference to the electrical services implies that only minimal amounts of power will be required. However, on Page 4-8, regarding the economic impact, it states that as the proposed use of the lands are not known, therefore, the economic impacts are not known. These statements appear to be contradictory.

Thank you for the opportunity to review and comment on the preparation notice.



Harold S. Masumoto
Vice President for Administration

cc Director R. O'Connell, OEQC
Chancellor S. Mitchell
Dean Fred Tom

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

DIVISIONS:
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

November 16, 1979

Mr. Harold S. Masumoto
Vice President of Administration
University of Hawaii
2444 Dole St., Room 212
Honolulu, Hawaii 96822

Dear Mr. Masumoto:

Your letter of October 22, 1979 relating
to the Panaewa Agricultural Park EIS
Notice of Preparation

Thank you for reviewing the Notice of Preparation. We will
respond to your comments in the order in which they are presented:

Page I-5: Funds spent for capital improvements constructed
by the State may not be totally repaid by the Lessees.
Lease rents are based on appraisals and in accordance
with provisions of existing statute on ag park disposi-
tions. However, as noted on page 1-9, each lessee
would be responsible for funding his own on-site
improvements.

Page 2-37: Water:

Water supplies are adequate to service the park. The
water system will be installed in accordance with
Hawaii Department of Water Supply's standards and
will be dedicated to them when constructed. Tenants
should apply for water service from the Department of
Water Supply and pay the prevailing water rates for
the area. The water system shall include a service
lateral to each lot and fire protection for a maximum
radius of 300 feet.

Power and Communications:

Electrical and telephone services are adequate to
serve the park. The State will fund the installation
of the pole lines, which are jointly used by both
services. The only initial cost to the tenants will

November 16, 1979

be the normal installation charge for new telephone service. However, if there is more than 320 feet from the last house serviced to the next consumer requesting service, a service connection charge will be assessed by Hawaiian Telephone Company. This charge will vary according to the amount of new line required to be installed.

Gas:

Gas supplies are adequate to serve the park. Installation of storage tanks will have to be coordinated and funded by the party requesting service. The storage tanks are furnished by Gasco, Inc., with the consumer paying an annual rental charge.

Page 4-11: The statements on page 4-8 are correct. The statements regarding use of electricity will be revised as follows: Electrical use is anticipated to be minimal for the majority of lots within the park, since use would primarily be limited to any on-site residences. It is anticipated that the two accessory use lots and the U. H. lot would use relatively more electricity than the other lots. A quantitative estimate of electrical use is not available at the present time.

Very truly yours,



SUSUMU ONO
Chairman of the Board

cc: Environmental Impact Study Corp. ✓
Hilo Engineering, Inc.

e.i.s. **12**
review period
comments & responses

SECTION 12

ORGANIZATIONS AND PERSONS CONSULTED
DURING THE EIS REVIEW PROCESS

The following list includes those agencies and organization who were consulted in the EIS review process. Letters of comment were received from those marked by an asterisk.

	<u>Page</u>
<u>FEDERAL GOVERNMENT</u>	
* United States Department of Agriculture, Soil Conservation Service	12-4
* United States Department of the Army, U. S. Army Engineer District, Honolulu, Hawaii	12-5
* United States Department of the Army, Headquarters, Fort Shafter	12-6
* United States Department of the Interior, Fish and Wildlife Service, Division of Ecological Services	12-7
* United States Department of the Interior, Geological Survey, Water Resources Division	12-8
* United States Department of Transportation, U. S. Coast Guard	12-10
* United States Navy, Headquarters, Naval Base Pearl Harbor	12-11
<u>STATE OF HAWAII</u>	
* Department of Accounting and General Services	12-12
* Department of Agriculture	12-13

	<u>Page</u>
<u>STATE OF HAWAII, Continued</u>	
* Department of Health	12-14
* Department of Planning and Economic Development	12-16
* Department of Transportation	12-18
* Department of Hawaiian Home Lands	12-20
Department of Education	
* Office of Environmental Quality Control	12-21
* Department of Defense, Office of the Adjutant General	12-24
* Department of Social Services and Housing, Hawaii Housing Authority	12-25
* State Energy Office	12-26
* University of Hawaii, Environmental Center	12-27
University of Hawaii, Water Resources Research Center	
University of Hawaii at Hilo, College of Agriculture	
* University of Hawaii at Manoa, Vice President for Administration.	12-28
University of Hawaii at Hilo, Cooperative Extension Service	
University of Hawaii at Hilo, Agricultural Experiment Station	
<u>COUNTY OF HAWAII</u>	
Office of the Mayor, Mayor Herbert T. Matayoshi	
* Planning Department	12-29

Page

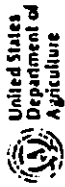
COUNTY OF HAWAII, Continued

County Council

- * Department of Parks and Recreation 12-30
- Department of Public Works
- Department of Research and Development
- * Department of Water Supply 12-31

OTHER

- Big Island Association of Nurserymen
- Gasco, Inc.
- Hawaii Anthurium Growers Cooperative
- * Hawaii Electric Light Company, Inc. 12-32
- Hawaii Farm Bureau Federation
- Hawaii Guava Growers Cooperative
- * Hawaiian Telephone Company 12-33
- * Hilo County Farm Bureau 12-34
- Hilo Macadamia Nut Association
- Keaukaha-Panaewa Farmers Association
- South Panaewa Community Association
- * University of Hawaii at Hilo, College of Agriculture Student Association 12-35
- Waiakea Soil and Water Conservation District



Soil Conservation Service
P. O. Box 50004
Honolulu, Hawaii 96850



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 501
HONOLULU, HAWAII 96850

February 7, 1980

Mr. Richard L. O'Connell
Director, Office of Environmental
Quality Control
550 Halekiausila St., Room 301
Honolulu, HI 96813

Dear Mr. O'Connell:

Subject: Panaewa Agricultural Park - Environmental Impact Statement
We reviewed the subject EIS and have the following comment:

On page 4-14, item 8, Drainage, it is mentioned that, "However, if final design requires drainage facilities, drywell sumps will be constructed at strategic locations." We have found that in the Keau macadamia nut orchards where the soils are the same type as the project area, drainage problems are developing in the mature orchards. This poor drainage problem may be caused by pahoehoe lava found at shallow depths. We are not certain of this.

If there are potentials for drainage problems, this will be a limitation for orchard development.

Thank you for the opportunity to review this document.

Sincerely,

Jack P. Kanalz
JACK P. KANALZ
State Conservationist

cc: Department of Land and Natural Resources
Division of Water and Land Development
P.O. Box 373
Honolulu, HI 96809

Mr. Jack P. Kanalz
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kanalz:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement. We appreciate your comments that the mature macadamia nut orchard in Keau (on soils similar to the project site) are developing drainage problems and that this may be caused by pahoehoe lava found at shallow depths. We will take these comments into consideration during final design of the Agricultural Park.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

ENVIRONMENTAL
CONSERVATION AND
DEVELOPMENT
COMMISSION
P. O. BOX 501
HONOLULU, HAWAII 96850



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858

FOUED-IV

24 January 1980

Mr. Richard L. O'Connell, Director
Office of Environmental Quality Control
553 Halekauwila Street, Room 101
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

We have reviewed the State's Environmental Impact Statement for the proposed Panaewa Agricultural Park, South Hilo, Hawaii and we provide the following comments:

There are no US Army Corps of Engineers requirements that are applicable to your proposed project. According to the flood insurance study for the Island of Hawaii, prepared by the US Federal Emergency Management Agency, Federal Insurance Program, the proposed agricultural park site is not located in any flood plain. The particular site is designated an area of minimal flooding (Zone C).

Thank you for the opportunity to comment on the Environmental Impact Statement for this project.

Sincerely yours,

Kisuk Cheung
KISUK CHEUNG
Chief, Engineering Division

Copy Furnished:
Department of Land and Natural Resources
Division of Water and Land Development
P.O. Box 373
Honolulu, Hawaii 96809

GEORGE A. JANTONIS
ENGINEER



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 611
HONOLULU, HAWAII 96808

February 28, 1980

Mr. Kisuk Cheung
Chief, Engineering Division
U. S. Army Engr. Dist., Honolulu
U. S. Department of the Army
Building 230
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project. We appreciate your comments that there are no U. S. Army Corps of Engineers' requirements applicable to the proposed project and that the project site is designated an area of minimal flooding.

Very truly yours,

Yusunu Ono
YUSUNU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

DIVISIONS:
Construction and
Maintenance
Planning
Public Works
Public and Land
Development
Water and Land
Development

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII 96858

AP27-212-2

21 JAN 1980

Office of Environmental Quality Control
State of Hawaii
353 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

The Environmental Impact Statement (EIS) for the Panacea Agricultural Park, Panacea, South Hilo, Hawaii has been reviewed and we have no comments to offer. There are no Army installations or activities in the vicinity of the proposed project site.

The EIS is returned in accordance with your request.

Sincerely,

(Signature)

PETER D. STEARNS
COL, EN
Director of Engineering and Housing

1 Incl
As stated

Copy furnished:
Department of Land and Natural Resources
Division of Water and Land Development
P.O. Box 373
Honolulu, Hawaii 96807



GEORGE R. JAYSON
GOVERNOR

DEVELOPS
CONSTITUTION AND
ALL LAWS
MANAGES
LAND AND NATURAL
RESOURCES
SUPERVISOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 421
HONOLULU, HAWAII 96807

January 31, 1980

Col. Peter D. Stearns, EN
Director of Engineering & Housing
Dept. of the Army
Headquarters U. S. Army Support Command,
Hawaii
Fort Shafter, Hawaii 96858

Dear Col. Stearns:

Panacea Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact
Statement for the subject project.

Very truly yours,

(Signature)
SUSUMU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA HUIAUA DOULEVARD
P. O. BOX 50167
HONOLULU, HAWAII 96850

January 22, 1980

IN REPLY, PLEASE REFER TO
ES
Room 6307



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 471
HONOLULU, HAWAII 96850

February 28, 1980

Office of Environmental Quality Control
Office of the Governor
555 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Re: Environmental Impact
Statement, Panaewa
Agricultural Park,
Panaewa, South Hilo,
Hawaii, Hawaii

Dear Sir:

We have reviewed the subject Environmental Impact Statement (EIS)
dated January 1980 and offer the following comments.

The endangered Hawaiian bat, *Lasiorus cinereus semotus*, is known to
forage in this area, and potentially uses the area for roosting. Perhaps
information regarding this species should have been mentioned in the
EIS. Other than this, the proposed project will have little if any
adverse effect on flora or fauna resources in the area.

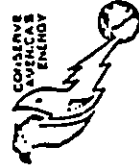
We appreciate this opportunity to comment.

Sincerely yours,

Maurice H. Taylor

Maurice H. Taylor
Field Supervisor
Division of Ecological Services

cc: PIA
RMFS
HDFAG
EPA, San Francisco
DLER, Div. of WLE&D



Save Energy and You Serve America!

DEVELOPMENT
CONSERVATION AND
ASSISTANCE
CONSERVATION
FISH AND WILDLIFE
LAND MANAGEMENT
PLANT MANAGEMENT
WATER AND LAND DEVELOPMENT

Mr. Maurice H. Taylor
Field Supervisor
Div. of Ecological Services
Fish and Wildlife Service
U.S. Dept. of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Taylor:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact
Statement for the subject project. We appreciate your
comment that the Hawaiian bat is known to forage in
the area and may use the area for roosting.

Very truly yours,

S. S. Oono
SUSUO OONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 47
HONOLULU, HAWAII 96850

DEVELOPER:
CONSTRUCTION AND
RECONSTRUCTION
PERMITS
LAND MANAGEMENT
STATE PLANNING
SITES AND LAND ACQUISITION

Mr. Benjamin L. Jones

-2-

February 21, 1980

February 21, 1980

Mr. Benjamin L. Jones
District Chief
Water Resources Division
U. S. Geological Survey
P. O. Box 50166
Honolulu, Hawaii 96850

Dear Mr. Jones:

Panaeoa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement.

Our responses are presented in the order of your comments:

1. Page 7: As we have stated in the EIS, the use of fertilizers and individual cesspools may have an impact on the ground water resources of the project area. However, current monitoring of the County Panaeoa Wells indicates no nitrate contamination. Also, the County of Hawaii will shortly initiate a program for the monitoring of nitrates, total dissolved solids, chloride, and coliforms.

Nitrate (as N) is presently the only one of these parameters which is monitored at Panaeoa Wells and, as shown in Appendix B of the EIS, recorded levels are far below EPA standards. The use of cesspools is the only disposal method currently available for residential sewage in the project area.

2. Page 9: The 110-acre University of Hawaii farm laboratory, though contiguous to and served by the proposed improvements, is not part of the Panaeoa Agricultural Park. The method by which animal wastes will be treated and disposed of will be addressed at a later date by the University of Hawaii. The information will be contained in a special addendum to the EIS and/or a separate report. In either case, the treatment and disposal of animal wastes will meet all applicable State and County regulations.

3. Page 2-2: We concur with this statement and the figure will be revised.

4. Page 4-10: Current plans by the Hawaii County Department of Water Supply call for monitoring nitrates, total dissolved solids, chlorides, and coliform at Panaeoa Wells, not phosphates as stated in the EIS.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

COMMANDER
Fourteenth Coast Guard District
Prince Kaimosiule Federal Bldg.
300 Ala Moana Blvd.
Honolulu, Hawaii 96813

16450
Serien 509
15 January 1980



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 871
HONOLULU, HAWAII 96813

February 21, 1980

DIVISIONS
CONSERVATION AND
RECREATION
LAND AND NATURAL
RESOURCES
PLANNING
POLICY AND ZONING
AGRICULTURE
LAND ACQUISITION
LAND AND WATER
REVENUE

Office of Environmental Quality Control
550 Halekiauila Street
Room 301
Honolulu, Hawaii 96813

Dear Sir:

The Coast Guard has reviewed the Environmental Impact Statement for the Panaeoa Agricultural Park and has no objection to the plan or constructive comments to offer at the present time.

12-10

Commander J. F. Otranto
District Planning Officer
Fourteenth Coast Guard Dist.
U. S. Coast Guard
Prince Kuhio Federal Bldg.
300 Ala Moana Blvd., Room 9151
Honolulu, Hawaii 96813

Dear Commander Otranto:

Panaeoa Agricultural Park
Environmental Impact Statement

Commander J. F. Otranto
District Planning Officer
Fourteenth Coast Guard District
By Direction of the District Commander

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

SUSUMU ONO
Chairman of the Board

RECEIVED BY THE DISTRICT COMMANDER

HEADQUARTERS
NAVAL BASE PEARL HARBOR
PEARL HARBOR, HAWAII 96860

IN REPLY REFER TO:
OOZA: 0002
Set 135

18 JAN 1980

Office of Environmental Quality Control
550 Halekualoa Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Environmental Impact Statement
Panama Agricultural Park

The Environmental Impact Statement for the Panama Agricultural Park forwarded by the Commission has been reviewed, and the Navy has no comments to offer. As requested, by the Commission, the subject EIS is returned.

The opportunity to review the EIS is appreciated.

Sincerely,



J. W. CARL
LIEUTENANT COMMANDER, USN
DEPUTY FACILITIES ENGINEER
BY DIRECTION OF THE COMMANDER

Encl

Copy to: (w/o encl)
State MAR



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 431
HONOLULU, HAWAII 96809

January 31, 1980

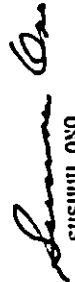
Lieutenant Commander J. W. Carl,
CE, U.S.N.
Deputy Facilities Engineer
Headquarters, Naval Base
Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860

Dear Lt. Commander Carl:

Panama Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,



SUSUKU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

RECEIVED
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HONOLULU, HAWAII 96809
JAN 31 1980

GEORGE B. ANTONIO
DIRECTOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII
P. O. BOX 51
HONOLULU, HAWAII 96810



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 51
HONOLULU, HAWAII 96810

February 8, 1980

RONALD S. ANTONIO
DIRECTOR

(P)1009.0

JAN 23 1980

Office of Environmental Quality
Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement for
Panaewa Agricultural Park

Thank you for this opportunity to review and comment
on the subject project.

The project will not have any adverse environmental ef-
fect on any existing or planned facilities serviced by our
department.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

H1188k
VCGT DLJHR

Mr. Rikio Nishioka
State Public Works Engineer
Division of Public Works
Dept. of Accounting & General Serv.
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Nishioka:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact
Statement for the subject project. We appreciate your
comment that the proposed project will not have any adverse
environmental effect on existing or planned facilities
serviced by the State Department of Accounting and General
services.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp. ✓

12-12

GEORGE R. ANTONIO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1435 HO. KUNG STREET
Honolulu, Hawaii 96822

JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE
YUKIO STEARNS
DEPUTY TO THE CHAIRMAN

GEORGE R. ANTONIO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 471
HONOLULU, HAWAII 96822

SPRINGERS
CONSTRUCTION AND
CONTRACTS
P.O. BOX 100
HONOLULU, HAWAII
96822

February 21, 1980

MEMORANDUM

To: Office of Environmental Quality Control

Subject: Panaewa Agricultural Park EIS
TAK: 2-2-4a; portion of 3 & 4
Island of Hawaii

The Department of Agriculture is in full support of the subject project. The proposed agricultural park will be located in one of the agricultural production centers of the Island of Hawaii and will complement the agricultural businesses of the surrounding area.

Thank you for the opportunity to comment.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

cc: DLNR - Water and Land Development

Honorable John Farias, Jr.
Chairman, Board of Agriculture
P. O. Box 22159
Honolulu, Hawaii 96822

Dear Mr. Farias:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project and for your support of the project.

Very truly yours,

SUSUMU ONO
Chairman of the Board

OPERATIONS
CONSTRUCTION AND
RENOVATION PROJECTS
CONTRACTS
PERMITS
LAND ACQUISITION
LAND MANAGEMENT
STATE AGENCIES
STATE AND FEDERAL AGENCIES



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 411
HONOLULU, HAWAII 96801

February 21, 1980

GEORGE R. ANTONSON
DIRECTOR

Mr. Melvin Koizumi
Deputy Director for
Environmental Health
Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement. We are writing in response to a letter received from Dr. James Kumagai, dated January 29, 1980, regarding the subject document.

Our responses are presented in the order of the comments:

1. Potential long-term impacts of fertilizer application on the ground water supply were discussed in a general nature because specific fertilizers and amounts will depend on the type of crops to be grown at the Agricultural Park.

It is likely that the primary fertilizers to be used will be nitrogen, phosphorous, and potassium. Nitrate (as N) is presently the only one of these three parameters which is monitored at Panaewa Wells and, as shown in Appendix B of the EIS, recorded levels are far below EPA standards.

Panaewa Wells are approximately 3/4 miles north of the proposed Agricultural Park. The water table is approximately 188-192 feet below the surface elevation of the wells. The Hawaii County Department of Water Supply will be monitoring these wells in the near future for nitrates, total dissolved solids, chlorides, coliforms, and other organic and inorganic chemicals as mandated by State regulations.

GEORGE A. YLSEN
DIRECTOR OF HEALTH
Assistant Secretary
Deputy Director of Health
Henry N. Thompson, M.A.
Deputy Director of Health
James S. Kumagai, Ph.D., P.E.
Deputy Director of Health



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

January 29, 1980

MEMORANDUM

To: Mr. Susumu Ono, Chairman of the Board
Department of Land & Natural Resources

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Panaewa Agricultural Park,
Panaewa, South Hilo, Hawaii

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we have no objections to this project.

We submit the following comments for your consideration and information:

1. The long-term impact of agricultural fertilizer application to groundwaters (Panaewa Wells) needs to be addressed.
2. Another concern is cross connection problems arising when the agriculture farms may mix fertilizers with the potable water system.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

James S. Kumagai
JAMES S. KUMAGAI, Ph.D.

cc: ORDC
DHO, Hawaii

Mr. Melvin Koizumi

-2-

February 21, 1980

2. We are in agreement that potential contamination of the potable water system may occur by cross-connection when fertilizers and other chemicals are used. We will, therefore, require the use of State approved back flow preventors if the potable water system is tied directly to the fertilizer system. Also, filling of sprayers for pesticides will require an air gap system between the sprayer tank and the potable water system. This system is diagrammed on the attached sheet.

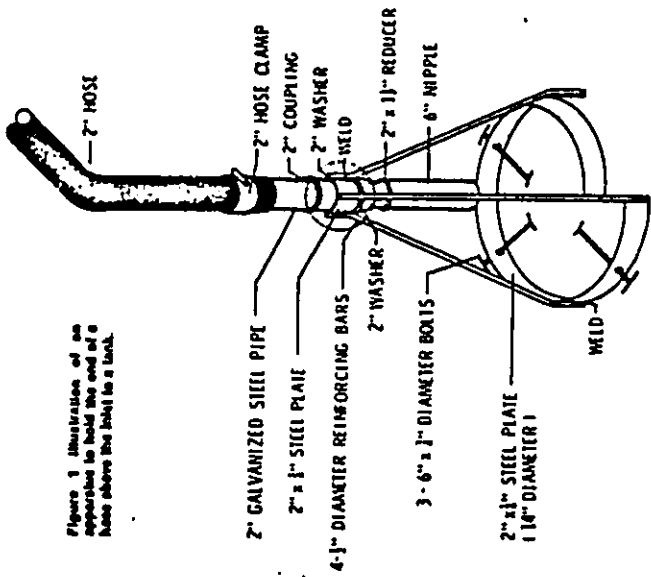
12-15

Attach.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

Figure 1 Illustration of an apparatus to hold the end of a hose above the tank in a tank.



All reproduced from "The Commercial Equipment for Water Works"

RECEIVED
FEB 08 1980
EISC

February 4, 1980

Ref. No. 0626

Mr. Richard L. O'Connell, Director
Office of Environmental Quality Control
550 Halekuanile Street
Honolulu, Hawaii 96813

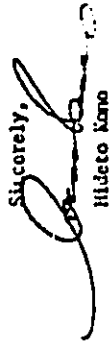
Dear Mr. O'Connell:

SUBJECT: Panaea Agricultural Park - EIS

We have reviewed the subject document and believe that it has adequately identified all major impacts associated with the development of the proposed agricultural park.

However, may we bring to your attention that the Hawaii State Plan does contain a number of priority directions or implementing actions in Part III, Section 103(c), which should be included in the narrative summary of state plan provisions related to agriculture (see pages 3-3 and 3-4 within the EIS). To clarify the relationship between State Plan objectives and policies and Priority Directions, please note that "objectives and policies" are considered long range and comprehensive, while "priority directions" identify specific areas of concern requiring more immediate governmental attention.

We appreciate the opportunity to review and comment on this matter.

Sincerely,

Hideto Kono

cc: Div. of Water & Land Dev., DEARV



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 51
HONOLULU, HAWAII 96809

February 21, 1980

Honorable Hideto Kono
Director, Department of Planning
and Economic Development
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Kono:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement.

We note that several Priority Directions from Part III, Section 103(d) of the Hawaii State Plan may be pertinent to the proposed project. They are:

- "(3) Assist small independent farmers in securing land and loans."
- "(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs."
- "(6) Encourage the use of public and private resources to develop agricultural and aquacultural activities which have economic growth potential."
- "(7) Explore new agricultural industries and encourage the expansion of existing agricultural industries that can provide jobs and profitable long-term use of land."
- "(9) Continue the development of agricultural parks."
- "(10) Expand vocational training programs in agriculture and aquaculture."
- "(11) Assist in providing adequate, reasonably priced water for existing agricultural activities."

DIVISION OF
CONSERVATION AND
RENEWABLE RESOURCES
CONTRACTS
PERMITS AND
LAND ACQUISITION
DIVISION
STATE AND LAND DEVELOPMENT

Hon. Hideto Kono -2- February 21, 1980

"(12) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions."

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 571
HONOLULU, HAWAII 96813

DIVISIONS
CONSERVATION AND
RECREATION
PLANNING
LAND AND NATURAL RESOURCES
WATER AND SOIL CONSERVATION

February 21, 1980

Mr. Ah Leong Kam
State Transportation Planner
Department of Transportation
869 Punchbowl St.
Honolulu, Hawaii 96813

Dear Mr. Kam:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement. Please be apprised that the subdivision roadway is being constructed to County of Hawaii Department of Public Works standards and will be dedicated to the County upon completion for operation and maintenance. The County, in reviewing the subdivision request and construction drawings, did concur with our plan to terminate Roads "C" and "D" with cul-de-sacs; however, they stated that in order to provide for possible future extensions of Roads "C" and "D", road reserves should be set aside beyond the cul-de-sacs of these streets.

Accordingly, we will respond to your comments in the order presented:

1. The 50-foot right-of-way road reserve will be extended between lots 23 and 24 with a dashed line, as a possible future extension to the South Hilo/Puna District Boundary.
2. The 50-foot right-of-way road reserve will be extended between lots 4 and 5 with a dashed line, as a possible future extension to Kalo Street.
3. The 60-foot right-of-way will not be shown ending in a cul-de-sac at the boundary of lots 1 and 2. This right-of-way road reserve will be extended between lots 1 and 31 with a dashed line, as a possible future extension to Volcano Road.
4. Access controls along Volcano Road will be shown on the final plans.

January 31, 1980 STP 8-8992

Dr. Richard O'Connell
Director
Office of Environmental
Quality Control
550 Halekuanila St., Room 301
Honolulu, Hawaii 96813

Dear Dr. O'Connell:

Subject: Environmental Impact Statement
Panaewa Agricultural Park
Panaewa, South Hilo

Thank you for giving us the opportunity to review and comment on the above-captioned statement.

Please be informed that access to Volcano Road via Road "A" will not be permitted. In retrospect, we recommend the following changes to the subdivision roadway:

1. Extend 50 feet roadway between lots 23 and 24 to the South Hilo/Puna District Boundary.
2. Extend 50 feet roadway between lots 4 and 5 to Kalo Street.
3. Provide cul-de-sac at boundary of lots 1 and 2.
4. Show access controls along the Volcano Road.
5. Revise name from Ianoolehua to Volcano Road.

Sincerely,

AH LEONG KAM
State Transportation Planner

ALX,jk
Enclosure
cc: HWY-P
ELJH

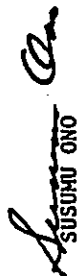
Mr. Ah Leong Kam

-2-

February 21, 1980

5. The plans will be revised to read Volcano Road, rather than Kanoelohua Avenue.

Very truly yours,


SUSUMU ONO
Chairman of the Board

GEORGE R. ANTONIO
Director of Parks

PROJECT OFFICES
HONOLULU OFFICE
P. O. BOX 173
HONOLULU, HAWAII 96813



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 119
HONOLULU, HAWAII 96813

February 7, 1980

Mr. Richard O'Connell, Director
Office of Environmental Quality Control
550 Halekauwila Street
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

SUBJECT: Panaewa Agricultural Park
Review of Environmental Impact Statement

The Department of Hawaiian Home Lands has reviewed the Environmental Impact Statement for the subject project and believes that the proposed project will be of great benefit to people interested in agricultural pursuits.

The availability of lands with the infrastructure necessary for a successful agricultural enterprise will greatly assist the future tenants of the program. In addition, the proposed project is in consonance with the Governor's program to expand the agricultural opportunities in an attempt to make Hawaii less dependent on the import of agricultural products.

The proposed project does not appear to have any adverse impact on the adjacent lands of this Department.

Thank you for the opportunity to review and comment on this project.

Sincerely yours,
Georgiana K. Padeken
Georgiana K. Padeken
in Chairman

EXP:GW:jn
Attachment

cc: Department of Land and Natural Resources
Division of Water and Land Development
P. O. Box 373
Honolulu, Hawaii 96809

GEORGE R. ANTONIO
Director

PROJECT OFFICES
HONOLULU OFFICE
P. O. BOX 173
HONOLULU, HAWAII 96813



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 171
HONOLULU, HAWAII 96813

February 21, 1980

Honorable Georgiana K. Padeken
Director and Chairman
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Ms. Padeken:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement. We appreciate your support and comment that the proposed project does not appear to have any adverse impact on the adjacent Hawaiian Home's land.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

DEVELOPER:
COUNCIL ON LAND
RESOURCES
CONTRACTS
P. O. BOX 248
HONOLULU, HAWAII 96813
STATE OF HAWAII
OFFICE OF LAND AND NATURAL RESOURCES

6-25

GEORGE R. ABYDOHN
GOVERNOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR

550 N. KALANIANA'OLE ST.
HONOLULU, HI 96825

RICHARD O'CONNELL
DIRECTOR
TELEPHONE NO. 548-3881
548-3881

January 31, 1980

MEMORANDUM

TO: Mr. Susumu Ono, Chairman
Board of Land and Natural Resources

FROM: Richard L. O'Connell, Director
Office of Environmental Quality Control

SUBJECT: Environmental Impact Statement for
Panaeoa Agricultural Park

We have reviewed the subject EIS and offer the following comments for your consideration.

Traffic

The EIS does not consider the short term impact of increased numbers of vehicles on the road during the initial construction period. A discussion should be included. Have any provision been made for the safety of children traveling to and from the newly completed playground located north of the proposed site?

Land Use

The EIS states this site was bulldozed and disturbed in the past. What was the land used for? What is the current land use at the proposed site? It is unclear whether this land is part of the Panaeoa Forest Reserve or adjacent to it. This should be clarified.

Susumu Ono
Page 2
January 31, 1980

Liquid Waste

We note that both Keaukaha and Papai Series soils have severe limitations for cesspool and septic tank disposal systems. Why then has this type of system been proposed?

Soils

The description of soils should include a discussion of their productivity for agriculture.

We have enclosed a list of commenting agencies and organizations on an attached sheet.

We thank you for the opportunity to review the subject EIS and look forward to the revised statement.

Attachment

DIVISION OF
CONSERVATION AND
RECREATION
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 571
HONOLULU, HAWAII 96813

February 21, 1980

GEORGE B. ANTONIO
DIRECTOR

LIST OF COMMENTING AGENCIES

FEDERAL

*U.S. Army Engineer District, Honolulu
*U.S. Fish and Wildlife Service
*Headquarters, Dept. of the Army
*Headquarters, Naval Base Pearl Harbor
*U.S. Coast Guard

January 24, 1980
January 22, 1980
January 21, 1980
January 18, 1980
January 15, 1980

STATE

*Department of Health
*Department of Accounting & General Services
*University of Hawaii, Administration
*Department of Defense
*State Energy Office

January 29, 1980
January 28, 1980
January 24, 1980
January 11, 1980
January 10, 1980

CORPORATE

*Department of Water Supply
*Department of Parks & Recreation

January 18, 1980
January 15, 1980

PRIVATE

*Hawaiian Telephone Company
*Hawaiian Electric Light Company, Inc.

January 21, 1980
January 24, 1980

*Denotes comment previously forwarded to DLNR by commenting party.

Mr. Richard L. O'Connell
Director, Office of Environmental
Quality Control
550 Halekaunila St.
Room 301
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement.

Our responses are presented in the order of your comments:

1. Traffic: Standard precautions will be written into the construction specifications to insure for the safe movement of the traffic during construction activities. The impacts of increased traffic during construction activities will be minor since most of the clearing activities will be confined to the project site and the development of individual parcels will be phased.

No special provisions for the safety of children traveling to the playground have been incorporated. The playground is separated from the project site and the total lot area is fenced in. Also, most of the children will be coming from the residential area located north of the project site and quite a few will undoubtedly be transported by cars.

2. Land Use: The project site is unencumbered State land which is lying idle. In recent years, portions of the site have been used for the illegal cultivation of marijuana. This is evidenced by the biological reconnaissance conducted on the project (refer to pages 2-21 and 2-29 of the EIS). The County Police Department was notified of this and appropriate action was taken.

The project site is adjacent to a lineal strip of the Panaewa Forest Reserve, which borders the Volcano Highway. This lineal strip is also a portion of TRM: 2-02-48: 03 and 04.

Mr. Richard L. O'Connell

-2-

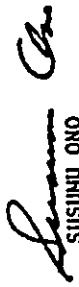
February 21, 1980

3. Liquid Waste: Cesspool and septic tank disposal systems were discussed because the area is not sewered and these methods of sewage disposal are the only methods in use in the vicinity of the project site. Tenants may elect to utilize other methods of disposal approved by the Department of Health.

4. Soils: The exact crops to be cultivated have not been determined; this will be left up to the individual farmer. As mentioned in the EIS on page 2-6, the dominant soil on the site (Papai extremely stony muck) can be used for woodland, pastures, orchard, and truck crops. While this soil is shallow and stony, it should be noted that certain crops, for example macadamia trees, can grow in shallow soils over aa lava as well as in deep soils. In addition, nursery crops are often grown in sterile medium rather than in the soil.

We have been advised by the U. S. Soil Conservation Service that if there are drainage problems, this will be a limitation for orchard development. However, as stated on page 4-14 of the EIS, if final design requires drainage facilities, dry-well sumps will be constructed at strategic locations.

Very truly yours,



SUSUMU ONO
Chairman of the Board

GEORGE B. ANTONI
Specialist



DIVISION
CONSTRUCTION AND
RECONSTRUCTION
PLANNING
AND
DESIGN
CONSTRUCTION
MANAGEMENT
AND
INSPECTION
DIVISION

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 431
HONOLULU, HAWAII 96816

January 31, 1980

11 JAN 1980

State of Hawaii
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 Diamond Head Road
Honolulu, Hawaii 96816

MEMO

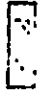
Office of Environmental Quality Control
550 Halekuanila Street, Room 301
Honolulu, Hawaii 96813

Genlcrsch:

Panaeewa Agricultural Park

Thank you for sending us a copy of the "Panaeewa Agricultural Park" Environmental Impact Statement. We have no comments to offer at this time. The Environmental Impact Statement is being forwarded to the Commission.

Sincerely,



WAYNE R. TOMOYASU
Major, CE, HARRNG
Contr & Engr Officer

cc: Dept of Land and
Natural Resources

Major Wayne R. Tomoyasu,
CE, HARRNG
Contracting & Engineering Officer
Office of the Adjutant General
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816

Dear Major Tomoyasu:

Panaeewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

SUSUMU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

DIVISION:
Conservation and
Natural Resources
Construction
Planning
Public Works
Land Management
Water and Land Resources



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 471
HONOLULU, HAWAII 96817

February 21, 1980

GEORGE A. ARITHON
Chairman

FRANKLIN Y. K. SUNN
Executive Director
WILLIAM A. HALL
Assistant Executive Director

IN REPLY REFER TO

RECEIVED

FEB 08 1980

EISC



STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
HAWAII HOUSING AUTHORITY

P. O. BOX 17907
HONOLULU, HAWAII 96817

February 4, 1980

GEORGE A. ARITHON
Chairman

MEMORANDUM

TO: Office of Environmental Quality Control
550 Halekanihala Street, Room 301
Honolulu, Hawaii 96813

FROM: Franklin Y. K. Sunn, Executive Director

SUBJECT: Panaewa Agricultural Park, Hilo, Hawaii

A review of the Environmental Impact Statement (EIS) for the subject project has been completed by this agency, and we have no objections or comments to offer on the proposed project.

The opportunity to review and comment on this project is appreciated.

FRANKLIN Y. K. SUNN
Original Signed
FRANKLIN Y. K. SUNN
Executive Director

HEINA
cc: Department of Land and Natural Resources
Division of Water and Land Development

DSSH

Mr. Franklin Y. K. Sunn
Executive Director
Hawaii Housing Authority
Dept. of Social Services &
Housing
P. O. Box 17907
Honolulu, Hawaii 96817

Dear Mr. Sunn:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board



DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
STATE ENERGY OFFICE

GEORGE R. ARYKOS
DIRECTOR
MARK B. BARNES
MANAGER

1161 Bishop St., Suite 650, Honolulu, Hawaii 96813

Ref No. 80-0021

January 10, 1980

Environmental Quality Commission
Office of the Governor
550 Halekanihala Street Room 301
Honolulu, HI 96813

Gentlemen:

The State Energy Office has no comments to offer regarding the EIS prepared for the Panaewa Agricultural Park located at Panaewa, South Hilo, Hawaii.

Copy provided us is herewith returned.

Sincerely,

Alfred S. Harris
Alfred S. Harris
Manager

ASJ/ck

c.c. Department of Land and Natural Resources



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 871
HONOLULU, HAWAII 96813

February 28, 1980

Mr. Alfred S. Harris
Manager, State Energy Office
Department of Planning and
Economic Development
1164 Bishop St., Suite 1515
Honolulu, Hawaii 96813

Dear Mr. Harris:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

Geoffrey O. Susumu
Geoffrey O. Susumu
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7301

Office of the Director

February 5, 1980

RE:0298

Mr. Bernard O'Connell
Office of Environmental Quality Control
550 Kalia Avenue
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Review of Draft Environmental Impact Statement
Panaewa Agricultural Park
South, Hilo, Hawaii

The Environmental Center has reviewed the above cited DEIS. In general, we feel that all significant environmental impacts are adequately addressed and have no comments to make at this time.

Sincerely,

Doak C. Cox

Doak C. Cox
Director

cc:/en

cc: DNR, Division of Water and Land Development
John Surrnsen



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 511
HONOLULU, HAWAII 96820

GEORGE S. ANTOS
DIRECTOR

February 21, 1980

Dr. Doak C. Cox
Director, Environmental Center
University of Hawaii
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Dr. Cox:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

Susumu Oyo

SUSUMU OYO
Chairman of the Board

AN EQUAL OPPORTUNITY EMPLOYER

UNIVERSITY OF HAWAII

RECEIVED
JAN 28 1980

VICE-PRESIDENT FOR ADMINISTRATION

January 24, 1980

EISU



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 571
HONOLULU, HAWAII 96822

DIVISION OF LAND AND
NATURAL RESOURCES
PLANNING AND
CONSERVATION
P. O. BOX 571
HONOLULU, HAWAII 96822

February 8, 1980

Office of Environmental Quality
Control
550 Maikauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: EIS - Panaewa Agricultural Park

We have reviewed the Environmental Impact Statement for the Panaewa Agricultural Park. We commented on this project in a memorandum to Mr. Susumu Ono, Chairman, Board of Land and Natural Resources, dated October 22, 1979. We have no further comments at this time.

Thank you for the opportunity to review and comment on the EIS document.

Sincerely,

Harold S. Masumoto
Vice President for Administration

cc: DLNR

Mr. Harold S. Masumoto
Vice President for Administration
University of Hawaii
2444 Dole St., Room 212
Honolulu, Hawaii 96822

Dear Mr. Masumoto:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

SUSUMU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

COPY — PLANNING DEPARTMENT COUNTY OF HAWAII
25 ALUPUNI STREET HILLO, HAWAII 96720



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISIONS:
CONSERVATION AND
RECREATION
PLANNING
LAND MANAGEMENT
STATE HISTORICAL
SITES AND LAND ACQUISITION

GEORGE B. ANTONIO
DIRECTOR

P. O. BOX 571
HONOLULU, HAWAII 96808

February 21, 1980

Office of Environmental
Quality Control
550 Halekualoa St., Room 301
Honolulu, Hawaii 96813

Gentlemen:

Environmental Impact Statement
Panaewa Agricultural Park
Panaewa, South Hilo, HI
TEL: 2-02-481000, 3 and 4 (79-202)

Thank you for the opportunity to review the EIS for the
above proposed subdivision.

Please be informed that we are satisfied with the pre-
sentation but note that the tax map key for the project should
be corrected to TXX: 2-02-481000, 3 and 4 on page 1-1.

For your information, the EIS will be incorporated into
our file for the above proposed subdivision.

Sincerely,
Sidney Yuke
Sidney Yuke
Director

WY:mab
cc:DLJR

Mr. Sidney Yuke
Director
Planning Department
County of Hawaii
25 Alupuni St.
Hilo, Hawaii 96720

Dear Mr. Yuke:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact
Statement. The tax map key noted on page 1-1 will be
corrected to read 2-02-48: portion of 3 and 4.

Very truly yours,

Susumi Oyo
SUSUMI OYO
Chairman of the Board

12-1-80



DEPARTMENT OF PARKS & RECREATION
COUNTY OF HAWAII

SCOTT L. ARYONG
DIRECTOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISIONS:
CONSERVATION AND
RESOURCES MANAGEMENT
CONSERVATION
RECREATION
LAND MANAGEMENT
STATE PARKS
STATE TRAILS

January 15, 1980

February 21, 1980

Office of Environmental Quality Control
550 Halekauwila St., Room 301
Honolulu, HI 97813

Subject: Panaea Agricultural Park - EIS

Our comments on the subject report are listed below:

- pg. 5 County playground on Hamaki Street has been completed.
- fig. 1-2 The location map should exclude the County park located at the extension of Hamaki Street - coincide with figures 1-3 and 1-4.
- pg. 3-1 County playground (first increment) has been completed.
- pg. 6-2 Same as above.

Thank you for the opportunity to review the report.

Scott L. Aryong
Scott L. Aryong
Director

encs. 2 copies of report being returned

Mr. Milton T. Hakoda
Director, Department of
Parks and Recreation
County of Hawaii
25 Aupuni St.
Hilo, Hawaii 96720

Dear Mr. Hakoda:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement.

We will respond to your comments in the order given:

- 1. Page 5: The EIS will be revised to indicate that the County playground on Hamaki Street has been completed.
- 2. Page 1-3: Figure 1-2 will be revised to exclude the County park.
- 3. Pages 3-1 and 6-2: The EIS will be revised to state that the first increment of the County playground has been completed.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

OR 21



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII
P. O. BOX 1820 • HILO, HAWAII 96720 • 33 AUPUNI STREET

COPY

GEORGE B. ANTONIO
DIRECTOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 571
HONOLULU, HAWAII 96809

DIVISIONS
CONSERVATION AND
RECREATION
LAND AND NATURAL RESOURCES
PLANNING
WATER
WATER RESOURCES
WATER RESOURCES
WATER RESOURCES

January 10, 1980

January 31, 1980

Environmental Quality Commission
Office of the Governor
550 Halekanihale Street, Room 301
Honolulu, HI 96813

PANAEWA AGRICULTURAL PARK
PRUEHA, SOUTH HILO, HAWAII

We have no comments to the subject Environmental Impact Statement. Water system construction drawings (preliminary) were submitted for our review.

Mr. E. M. Hohn
Deputy Manager
Dept. of Water Supply
County of Hawaii
P. O. Box 1820
Hilo, Hawaii 96720

Dear Mr. Hohn:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

E. M. Hohn
Deputy Manager

QA

cc - Department of Land and Natural Resources
✓ Division of Water and Land Development

SUSUMU OYO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

... Water brings progress...

HAWAII ELECTRIC LIGHT COMPANY, INC.
P. O. BOX 1027 HILO, HAWAII-96720



CUST 3-3-1
H-W/G
XC: ENV (GEN)

GEORGE R. JANTONIS
DIRECTOR



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 411
HONOLULU, HAWAII 96813

DIVISIONS:
COMPLAINTS AND
CONSTRUCTION PERMITS
CONSERVATION
PLANNING
CIVIL ENGINEERING
LAND ACQUISITION
LAND USE PLANNING
LAND USE REVIEW

January 24, 1980

January 31, 1980

Office of Environmental Quality Control
521 Halekuanila Street, Room 301
Honolulu, Hawaii 96813

Hawaii Electric Light Company, Inc.
P. O. Box 1027
Hilo, Hawaii 96720

Attn: Mr. Jitsuo Niwao, Manager
Engineering Department

Gentlemen:

SUBJECT: Environmental Impact Statement
Panaewa Agricultural Park
Panaewa, South Hilo, Hawaii

Panaewa Agricultural Park
Environmental Impact Statement

We have no comments to the above subject; however, we are preparing electrical plans for this project.

Thank you for reviewing the Environmental Impact Statement for the subject project.

Very truly yours,

Jitsuo Niwao, Manager
Engineering Department

Very truly yours,

SUSUMU ONO
Chairman of the Board

JW:cmh
cc: Dept. of Land & Natural Resources

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

12-1-32

HAWAIIAN TELEPHONE COMPANY

P.O. BOX 4249 • HILO, HAWAII 96720 • TELEPHONE 959-5111 • CABLE: TELHAWAII

January 21, 1980

Office of Environmental Quality Control
550 Halekaunila Street
Honolulu, HI 96813

Gentlemen:

Subject: EIS for Panaewa Agricultural Park

Thank you for the opportunity to review the subject EIS. We have no comments or recommendations to offer at this time.

To insure that communications facilities for this development will be available when needed, please provide us with plans and construction timetables as soon as they become available.

Yours truly,

T. S. Yamada
T. S. Yamada
Island Manager

cc: Department of Land and Natural Resources



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 421
HONOLULU, HAWAII 96809

January 31, 1980

Hawaiian Telephone Company
P. O. Box 4249
Hilo, Hawaii 96720

Attn: Mr. T. S. Yamada
Island Manager

Gentlemen:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project. We will transmit the construction plans and timetables when they become available.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

cc: Hilo Engineering, Inc.
Environment Impact Study Corp.

DECISIONS
CONSIDERATION AND
APPROVAL OF
PROJECTS
RELATIVE TO
LAND USE
AND DEVELOPMENT
WITHIN THE STATE OF HAWAII

HILO COUNTY FARM BUREAU

875 KOMOHANA ST.

HILO, HAWAII - 96720



GEORGE A. JANTZEN
Secretary



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 67
HONOLULU, HAWAII 96808

DIVISION OF
CONSTRUCTION AND
CONTRACTS
CONSTRUCTION
PERMITS
AND MAINTENANCE
DIVISION
STATE OF HAWAII

February 21, 1980

February 6, 1980

Office of Environmental Quality Control
550 Halekuanila St., Room 301
Honolulu, HI 96813

Dear Sirs:

Thank you for giving us the opportunity to review the Environmental Impact Statement prepared on the "Panaewa Agricultural Park," Island of Hawaii. I want to compliment you for the excellent report which is the result of a thorough study and compilation of many pertinent data.

12-34

The Hilo County Farm Bureau has always advocated making lands available to our farmers. We are delighted that your study is paving the way for the realization of that "dream" for our farmers in the Hilo area.

Sincerely,

HILO COUNTY FARM BUREAU

Maichi Ouye
Maichi Ouye, Secretary

cc Dept. of Land and Natural Resources
Division of Water and Land Development

Mr. Maichi Ouye
Secretary, Hilo County
Farm Bureau
875 Komohana Street
Hilo, Hawaii 96720

Dear Mr. Ouye:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement for the subject project. We appreciate your support of our efforts in this project.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

DIVISION OF
CONSERVATION AND
RECREATION
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 571
HONOLULU, HAWAII 96813



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 571
HONOLULU, HAWAII 96813

February 21, 1980

GEORGE S. ANTONIO
MEMBER

RECEIVED February 5, 1980

Office of Environmental Quality Control
550 Halekaula Street
Room 301
Honolulu, Hawaii 96813

Dear Commissioners,

Thank you very much for the opportunity to participate in the EIS review process for the Panaewa Agricultural Park. It is an extremely thorough and educational document and it greatly enhanced my knowledge of Hilo/Puna ecology.

On behalf of the students of the College of Agriculture, who will be users of the ag park, I accept the conclusions of this study and urge formal acceptance by the DLNR.

May I point out at this time that the College of Agriculture wishes direct access to the UHH Farm Laboratory. This could be done by extending Road A to the Volcano Highway or providing a short entrance road from the highway to the middle of the UHH Farm Laboratory. The latter choice would maintain the desired security for the rest of the ag park. I realize that what the EIS sent to me is a final draft and will not be revised. However, it is hoped that this access could be implemented during construction.

I assure you that every student here eagerly awaits release of the land (and subsequent release of appropriations) for the UHH Farm Laboratory. I am

Respectfully yours,
James D. Sutherland
James Sutherland
President
College of Agriculture Student Assn.

University of Hawaii-Hilo
Campus Center
Room 214
Hilo, Hawaii 96720

cc: Dean Fred Tom
DLNR
ECC

Mr. James Sutherland
President, College of
Agriculture, Student Assn.
University of Hawaii at Hilo
Campus Center, Room 214
Hilo, Hawaii 96720

Dear Mr. Sutherland:

Panaewa Agricultural Park
Environmental Impact Statement

Thank you for reviewing the Environmental Impact Statement.

We appreciate your desire for direct access to the UHH Farm Laboratory from Volcano Road; however, it appears unlikely at this time. We have been advised by the Department of Transportation, State of Hawaii, that there are access controls along the Volcano Road which prohibit this. Thus, the extension between lots 1 and 31 and the highway will be shown as a road reserve for potential future extension only. In addition, the Department of Public Works, County of Hawaii, has reviewed and approved the proposed traffic pattern.

Please note that the EIS was not a "final draft". It will be revised and will incorporate comments and responses made during the 30-day review period.

Very truly yours,

Susumu Ono
SUSUMU ONO
Chairman of the Board

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appendices

APPENDIX A
UNIVERSITY OF HAWAII
FARM LABORATORY

APPENDIX A

UNIVERSITY OF HAWAII
FARM LABORATORY

The University of Hawaii at Hilo has instructional programs in agriculture serving an enrollment of over 200 students. For the University to fulfill its mandate of providing education and practical training to these students, a suitable farm laboratory must be available. After investigating a number of sites, the University determined that the most suitable site would be within the proposed Panaewa Agricultural Park, south of Hilo. The reasons for selection of this site are (1) reasonably close to the campus (five miles), (2) arable soil type (a'a), and (3) large land area. The site is approximately one-fourth of the total land area required by the University of Hawaii for a farm laboratory. Other lands in the Hilo and Puna areas are being studied for possible additional acquisition.

The University of Hawaii is committed to providing a rounded agricultural education and training for its students and the farm laboratory is a vital complement for this process. This farm laboratory will avail facilities and opportunities for students to actually be participants in the operation of commercial sized farm enterprises. Using the "hands-on" training approach,

graduates are expected to be able to enter into commercial agricultural enterprises with the minimum of time to be independent operators.

The proposed Farm Laboratory is to provide physical facilities of sizes that are commensurate with commercial operations. They should be large enough to be considered as economic units that will provide an independent farm family a reasonable standard of living.

This farm laboratory will provide experiences in crop and livestock operations. While providing students with training experience, the crops and products from the farm laboratory will be sold to provide funds to make the farm nearly self-sufficient without total dependence on public funds. Safeguards will be provided in the sale of the produce and products so that the farm will not unfairly compete with independent producers.

It is essential, therefore, to locate the farm close to the classes and provide land that typifies the area. A location at Panaewa and the use of the "hands-on" approach to farm operations will fulfill the primary objectives of the agricultural training program of the University of Hawaii.

The University Farm Laboratory will consist of farming enterprises which are successfully undertaken in the Hilo environs. Among them are enterprises such as: macadamia,

papaya, poultry, swine, vegetables, and the like. Enterprises not considered to be economically feasible in the Hilo area, such as coffee, pineapple and mango will not be included, except perhaps on a limited scale for purely demonstration or exhibition purposes.

EXCERPTED FROM: Farm Laboratory Development Plan, University of Hawaii at Hilo, Hilo, County of Hawaii, State of Hawaii. October, 1977. Prepared by: Tamotsu Sahara and Harold Tanaka. Prepared for: Facilities Planning Office, University of Hawaii, Honolulu, Hawaii.

APPENDIX B
CHEMICAL ANALYSES
PANAewa WELL WATER

APPENDIX B
CHEMICAL ANALYSES - PANAewa WELL WATER

Parameter	MCL(1) mg/l	Date Water Sampled		
		11/13/74	4/17/78	10/11/78
Arsenic	.05	<.005	<.02	<.02
Barium	1.0	-	<.8	<.8
Cadmium	.010	-	<.001	<.005
Chromium	.05	-	<.01	<.01
Fluoride	1.4	.22	<.2	<.2
Lead	.05	.023	<.01	<.01
Mercury	.002	-	<.0005	<.0005
Nitrate (as N)	10.0	-	.29	.33
NO ₂	-	<.01	-	-
NO ₃	-	.24	-	-
Selenium	.01	<.001	<.008	<.01
Silver	.05	-	<.03	<.03
Chlorides	-	2.0	2.3	6.1
Copper	-	<.02	-	-
Iron	-	<.01	-	-
Manganese	-	<.03	-	-
Total Dissolved Solids	-	40.0	90.0	84.0
Zinc	-	<.01	-	-
Endrin	.0002	-	-	ND(2)
Lindane	.004	-	-	ND
Methoxichlor	.1	-	-	ND
Toxaphene	.005	-	-	ND
2,4-D	.1	-	-	ND
2,4,5-TP	.01	-	-	ND

(1) Maximum Contaminant Level (EPA Standard)
(2) ND - Not Detected

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