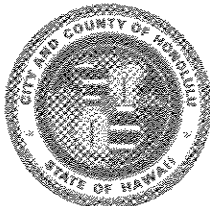


DEPARTMENT OF LAND UTILIZATION  
**CITY AND COUNTY OF HONOLULU**  
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813 • (808) 523-4432

EILEEN R. ANDERSON  
MAYOR



MICHAEL M. MCELROY  
DIRECTOR

ROBERT B. JONES  
DEPUTY DIRECTOR  
81/SMA-108(SM)

January 19, 1982

Environmental Quality Commission  
State of Hawaii  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

Gentlemen:

Revised Environmental Impact Statement (EIS)  
Kahaluu Industrial Project Development  
Alexander and Baldwin, Inc.  
Tax Map Keys: 4-7-13: 01, 10, 11, 12, 16, 24

We are notifying you of our acceptance of the above as an adequate fulfillment of Ordinance No. 4529, as amended.

Major issues not directly related to Special Management Area concerns, but considered to be controversial include:

1. Appropriateness of the industrial zoning;
2. Cumulative impacts of the proposed projects;
3. Foreclosure of planning options; and
4. Increase in land valuation and taxes.

Along with the submittal of the application for a Special Management Area Use Permit (SMP), the applicant will submit the following information:

1. Exact method of sewage treatment and disposal;
2. Flood hazard;

Environmental Quality Commission  
Page 2

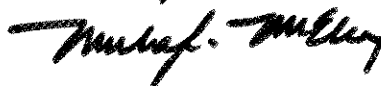
3. Preliminary approval of the proposed drainage grading plan by the Department of Public Works; and
4. Clearing and landscaping plan.

Other concerns, which will be addressed by subsequent permit processes, include:

1. Preliminary water commitment from the Board of Water Supply; and
2. Highway improvement plans as required by the State Department of Transportation.

If there are any questions, please contact Sampson of our staff at 523-4077.

Very truly yours,



MICHAEL M. McELROY  
Director of Land Utilization

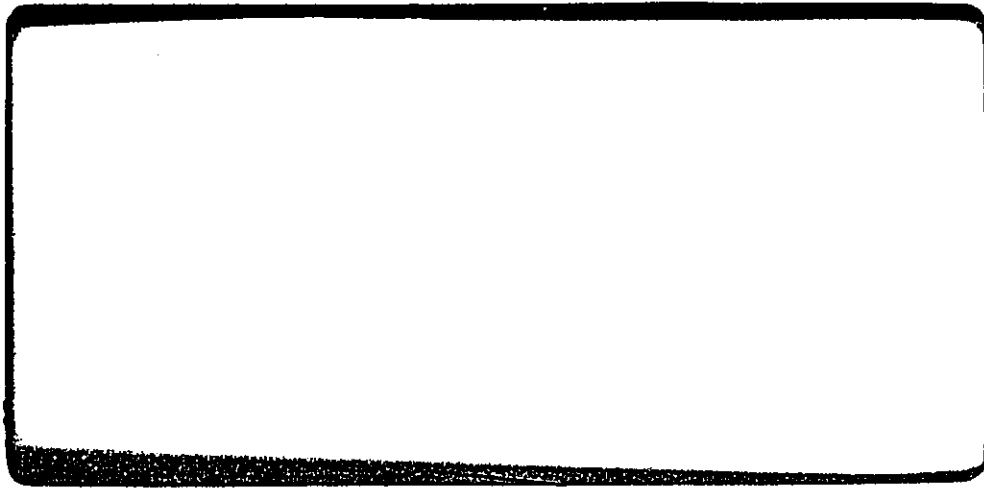
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FOR THE  
PROPOSED KAHALUU INDUSTRIAL  
PROJECT DEVELOPMENT

**GRAY, HONG & ASSOCIATES, INC.**  
CONSULTING ENGINEERS  
Civil / Sanitary

OA  
283



Office of Environmental Quality Control  
235 S. Beretania #702  
Honolulu HI 96813  
586-4185

DATE DUE

*Oct. 23, 1997*

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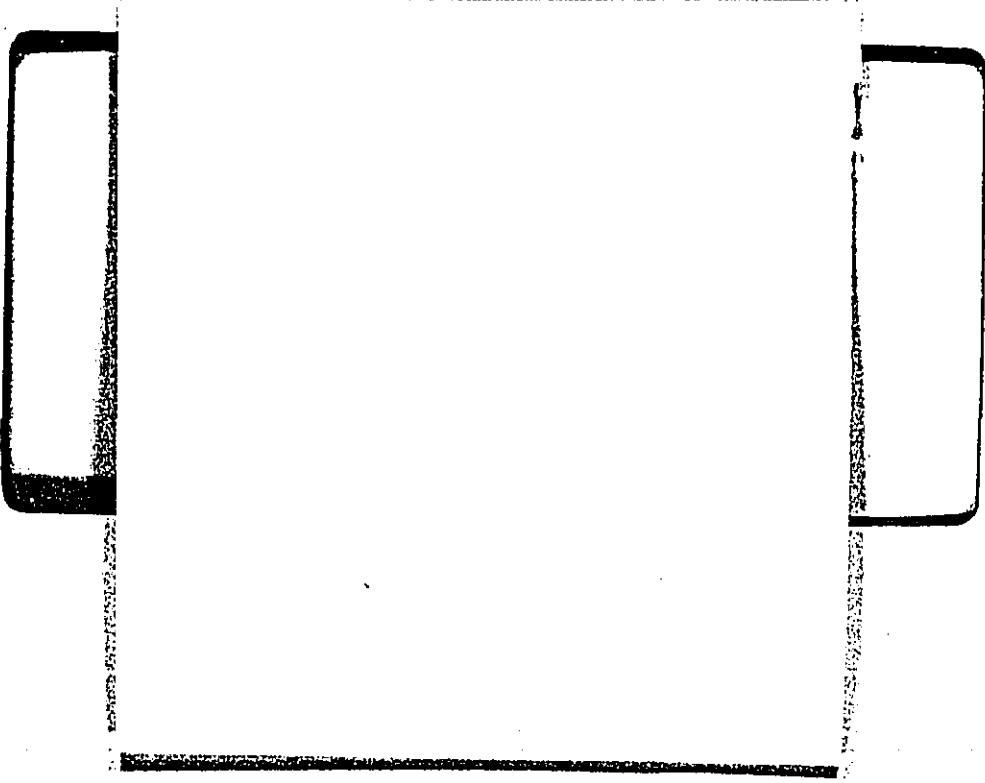
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REVISED  
ENVIRONMENTAL IMPACT STATEMENT  
FOR THE  
PROPOSED KAHALUU INDUSTRIAL  
PROJECT DEVELOPMENT

1/82

Prepared by:

GRAY, HONG & ASSOCIATES, INC.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

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E	Air Quality Study
F	Botanical Survey
G	Fauna Report
H	Traffic Study
I	Market Study
J	Agricultural Feasibility Study

I. SUMMARY

Alexander and Baldwin, Inc. proposes to construct a 21-lot light industrial subdivision and agricultural/residential lot, tentatively referred to as the "Kahaluu Industrial Development." The project will be situated on 26.0 acres near the intersection of Waihee Road and Kamehameha Highway in Heeia, Koolaupoko, Oahu. The project is divided by Kamehameha Highway.

The proposed project consists of a 21-lot light industrial subdivision on the industrial-zoned portions of the site. Depending on the method of sewage disposal ultimately allowed, the applicant proposes to create an agricultural lot or residential subdivision on the R-3 residentially zoned portion of the site. The proposed action will include the on-site construction of roadway system, drainage system, water system and sewage collector system. The 1981 estimated cost of the proposed project is 5.0+ million dollars.

Presently, there is no one residing at the site. The proposed development will not alter the demographic data for the Kahaluu area unless residential use is implemented on the R-3 residentially zoned portion of the site.

The 26.0-acre parcel is located on low-lying land of mostly flat terrain except for the southwestern portion of the site. Two distinct, yet related, physical settings are exhibited within the boundaries of the subject site. The portion of the site makai of Kamehameha Highway is covered with thick stands of hau and mangrove. The mauka portion of the site is mostly overgrown with introduced grasses. The proposed action will alter the site from its undeveloped and vacant state to a light industrial subdivision and an agricultural lot or R-3 residential lot. It should be noted, however, that the area surrounding the project site has been previously urbanized. Within close proximity of the site there are a wide variety of land uses including strip industrial/commercial development, residences and small "truck" farms. A Hawaiian Telephone transfer station, a Board of Water Supply pumping station, a Hawaiian Electric booster station, residential structures and a church lie immediately adjacent to the southeastern and mauka boundaries of the subject parcel.

The project site is bounded on the makai side by Kaneohe Bay; however, no structures are proposed to be built in the Bay or within the Shoreline Setback Area, with the possible exception of drainage improvements to the North Waihee Stream channel. The project will require a Department of the Army permit.

Portions of the project site are located within the Special Management Area (SMA). A Special Management Area Use Permit application must be submitted to the Department of Land Utilization prior to implementation of the

proposed action. An accepted Revised EIS is required as a part of the SMP application submittal. The accepting authority for this EIS is the Department of Land Utilization, City and County of Honolulu.

It is anticipated that the proposed action will have some adverse effects on noise, air and surface water quality and traffic during construction. In addition, there will be a permanent increase in the amount and velocity of stormwater runoff. It is also expected that the proposed project will increase: traffic on Kamehameha Highway and neighboring collector streets, ambient noise levels and auto emissions to the atmosphere. The need for public utilities and services, including water, will increase. The project site's aesthetic value of open space will be replaced by urbanization. Mitigation measures proposed to minimize adverse environmental effects are inherently provided by complying with all necessary government regulations, approvals and standards applicable to the project.

Alternatives to the proposed action which are discussed, include no action and alternatives for the action which could feasibly attain the objectives of the project, such as: complete development of the site to a light industrial subdivision, or residential subdivision, or agricultural use; and postponing development until a future time.

Inherent in any intensification of land use is the trade-off between short-term environmental gains at the expense of long-term losses and vice-versa. The construction of this project is no exception. The proposed light industrial subdivision forecloses future options such as recreational use, in the sense that the site is anticipated to be committed for the life of the structures that are anticipated to be built on the lots. However, it should be noted that the project site is zoned for light industrial and residential uses, and therefore the proposed action shall commit the site to its intended use.

Irreversible and irretrievable commitments of resources include: the intensification of the land use of the site from its presently undeveloped state; the labor, materials, and energy required to accomplish the project; and future consumption of potable water and petroleum-generated electricity by future occupants of the project.

Unresolved issues include a commitment of potable water for the proposed project; the method of sewage disposal; and opposition to the proposed action by the Kahaluu Neighborhood Board and the Hui Malama Aina O'Koolau. The Kahaluu Neighborhood Board's major concern is based on planning options for the area. (See Section XI - A17 for consultation letter).

## II. DESCRIPTION OF THE PROPOSED ACTION

### A. PROJECT LOCATION

The site for the proposed 26.0+ acre light industrial and residential/agricultural development is located in Heeia, Koolaupoko, Oahu (Figure 1 - Location Map) and is identified as Tax Map Keys: 4-7-13:01, 10, 11, 12, 16, 24 (Figure 2 - Tax Map). The project is divided by Kamehameha Highway. Henceforth, the portion of the project on the makai side of Kamehameha Highway will be referred to as the "makai section" (TMK Parcel No. 1) and the portion of the site on the mauka side, as the "mauka section" (TMK Parcel Nos. 10, 11, 12, 16, 24).

The project site is bounded on the makai side by Kaneohe Bay. Directly southeast of the makai section is Kahaluu Beach Park. A Hawaiian Telephone transfer station, a Board of Water Supply pumping station, a Hawaiian Electric booster station, residential structures and a church border the Southeast boundary of the mauka section. Residential structures and small truck farms border the mauka boundary. A small unnamed stream sometimes referred to as North Waihee Stream and incorrectly shown on TMK maps as Kaalaea Stream delineates the northwestern boundary of the property. (For the purpose of this document, the aforementioned stream will be consistently referred to as North Waihee Stream). The makai section is covered by a dense hau thicket from Kamehameha Highway to the shoreline, where mangrove replaces the hau. The mauka section is mostly overgrown with introduced grasses and has been used for grazing in recent years.

### B. STATEMENT OF OBJECTIVES

According to the applicant, there is a need for the mixed use of the site as proposed. At present, there is a limited supply of vacant land zoned for industrial use on the Windward side. To support this contention, a market study (Appendix I) has been prepared which reports that there is a demand for industrial land in the Kahaluu area. In addition, the proposed project would offer the local populace added employment alternatives in service-oriented trades, light industrial trades and possibly commercial agriculture. The mixed use of the site should be consistent with the existing mixture of industrial and residential structures in the surrounding

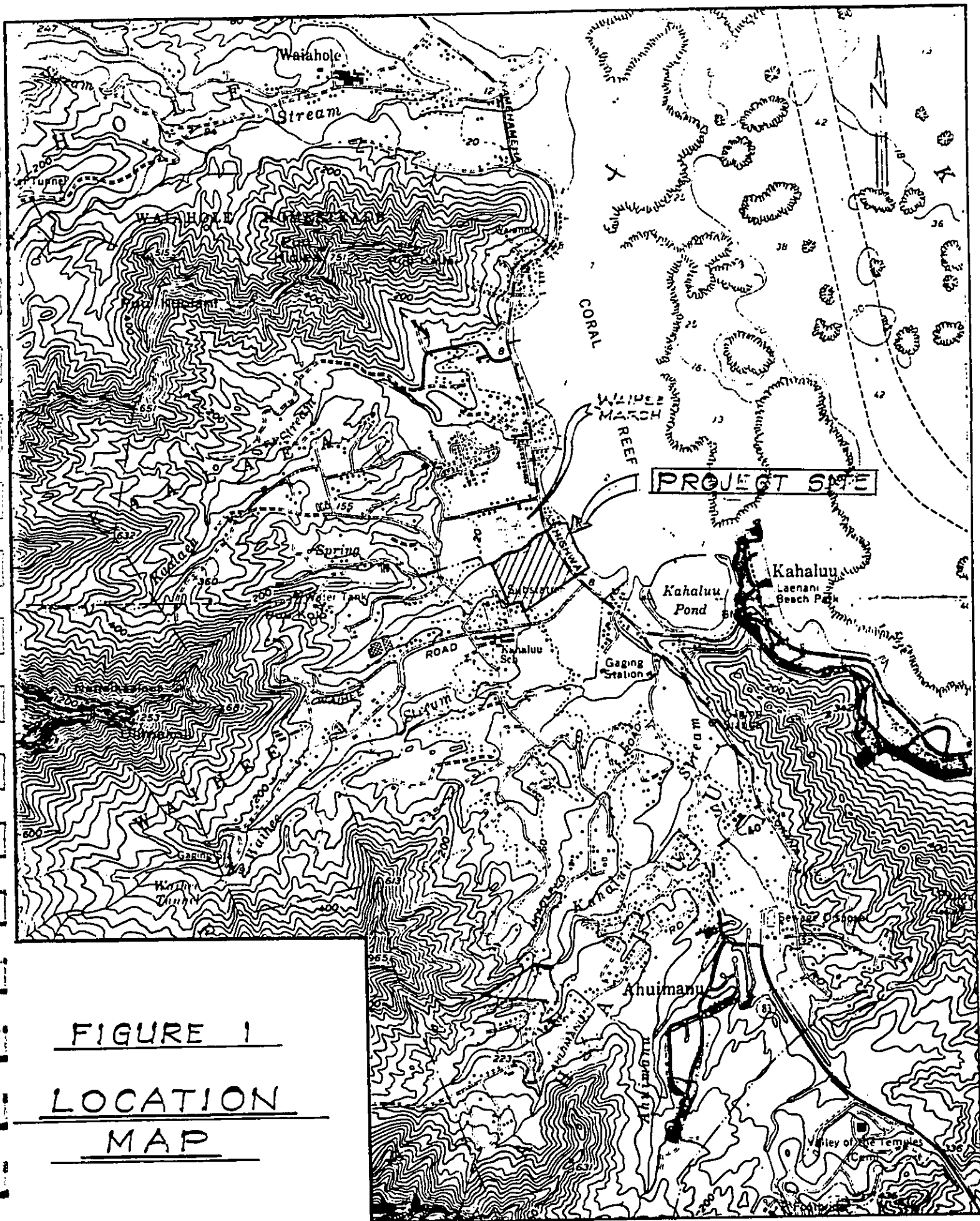


FIGURE 1  
LOCATION  
MAP

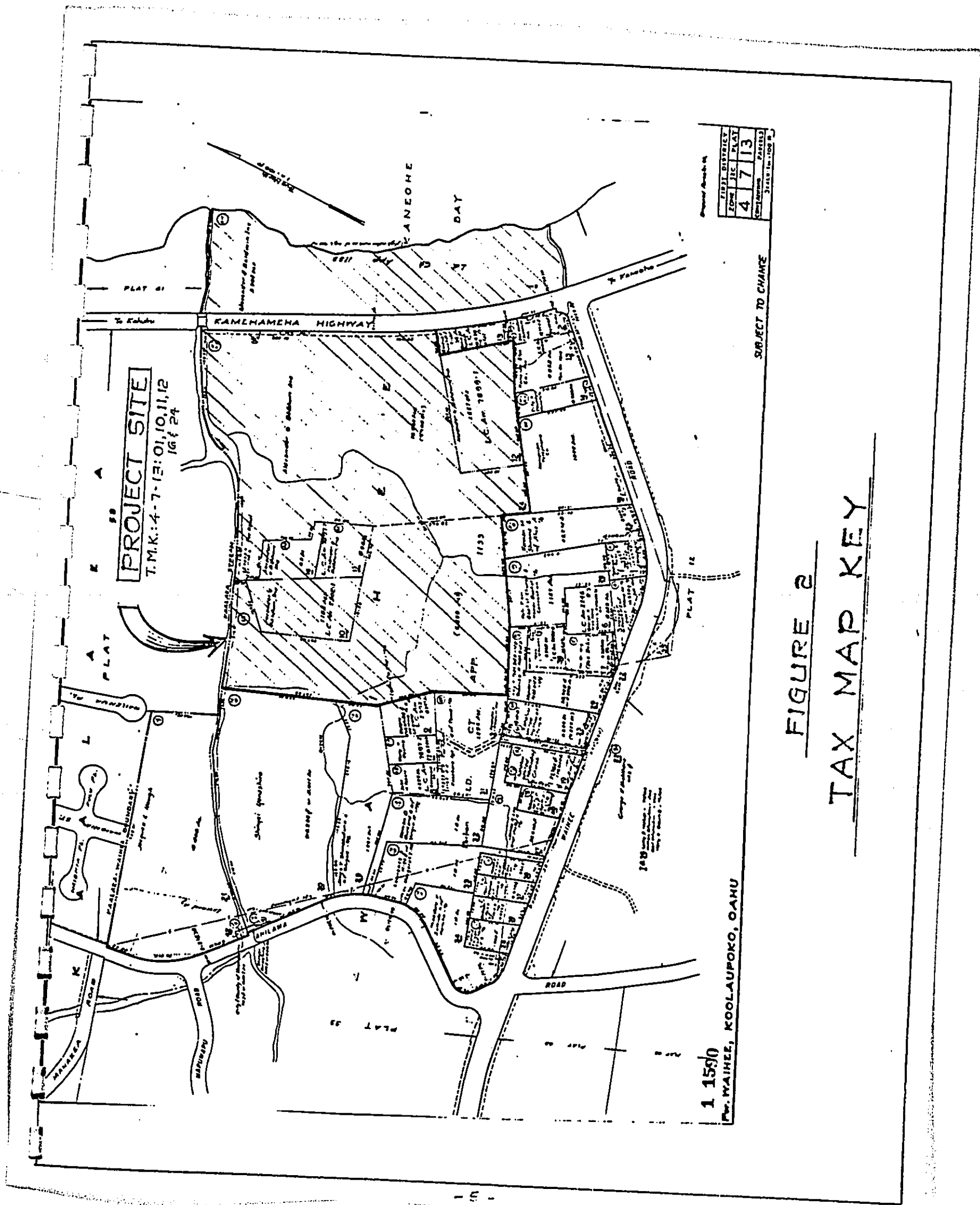


FIGURE 2  
TAX MAP KEY



area. The specific types of employment opportunities are illustrated by the types of permitted uses for light industrial subdivisions. Table 1 outlines the anticipated types of uses which will ultimately occupy the site as allowed by the Comprehensive Zoning Code (CZC).

TABLE 1

Permitted Uses Within Light Industrial (I-1)  
Subdivisions Which May Be Anticipated at  
The Kahaluu Industrial Project

1. Automotive sales and rentals, repair garages, including part and supply stores, automobile service stations, and car wash facilities;
2. Banks and other financial institutions;
3. Bulk storage yards and building contractors' yards; provided that no sale or processing of scrap, salvage or second-hand material shall be permitted in such yards; and provided further that such storage yards shall be completely enclosed except for necessary openings for ingress and egress by a fence or wall not less than 6 feet in height;
4. Eating and drinking establishments;
5. Establishments such as linen suppliers, freight movers, communication services and canteen services;
6. Establishments which deliver merchandise in bulk by truck or van; establishments which sell heavy equipment;
7. Certain types of manufacturing, processing, extracting, packaging or fabricating establishments;
8. Printing, lithographing, publishing or photography establishments;
9. Public buildings and grounds;
10. Repair establishments;
11. Utilities installations and offices;
12. Vocational technical, industrial and trade schools;
13. Wholesaling, warehousing, storage or distribution establishments;

14. Veterinary establishments and commercial kennels, provided that all animals shall be kept in sound-proofed and air-conditioned buildings;
15. Auditoriums, assembly halls and union halls;
16. Certain types of offices and medical laboratories;
17. Child care centers;
18. Greenhouses and plant nurseries;
19. Private clubs, lodges, social centers, eleemosynary establishments and athletic clubs;
20. Radio and television broadcasting stations and line-of-sight relay devices;
21. Offices and medical laboratories.

C. GENERAL DESCRIPTION OF THE ACTION'S TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS

1. Technical Characteristics

The project site contains an area of about 26.0 acres. Within the property, there are three different zoning designations, i.e., I-1 Light Industrial (14+ acres), R-6 Residential District (4+ acres), and R-3 Residential District (8+ acres) as illustrated on the Zoning Map (Figure 3) and summarized in Table 2. The applicant proposes to construct 21 light industrial subdivision lots ranging in size from 0.39 to 0.80 acres on the industrially zoned portion of the site. Seventeen (17) of the lots will be located on the mauka side of Kamehameha Highway. The four (4) remaining industrial lots will be located on the makai side of Kamehameha Highway. Individual tenants will develop the ultimate structures on the lots in conformance with the Comprehensive Zoning Code (CZC). On the R-3 residentially zoned portion of the site, the applicant proposes to create an agricultural lot or residential subdivision lots depending on the method of sewage disposal ultimately allowed. The R-6 Residential District (4+ acres) could provide a maximum of 34 houselots and the R-3 Residential District (8+ acres) could provide a maximum of 34 houselots. However, the applicant does not envision any residential house-lot development on the R-6 Residential District. (The maximum number of

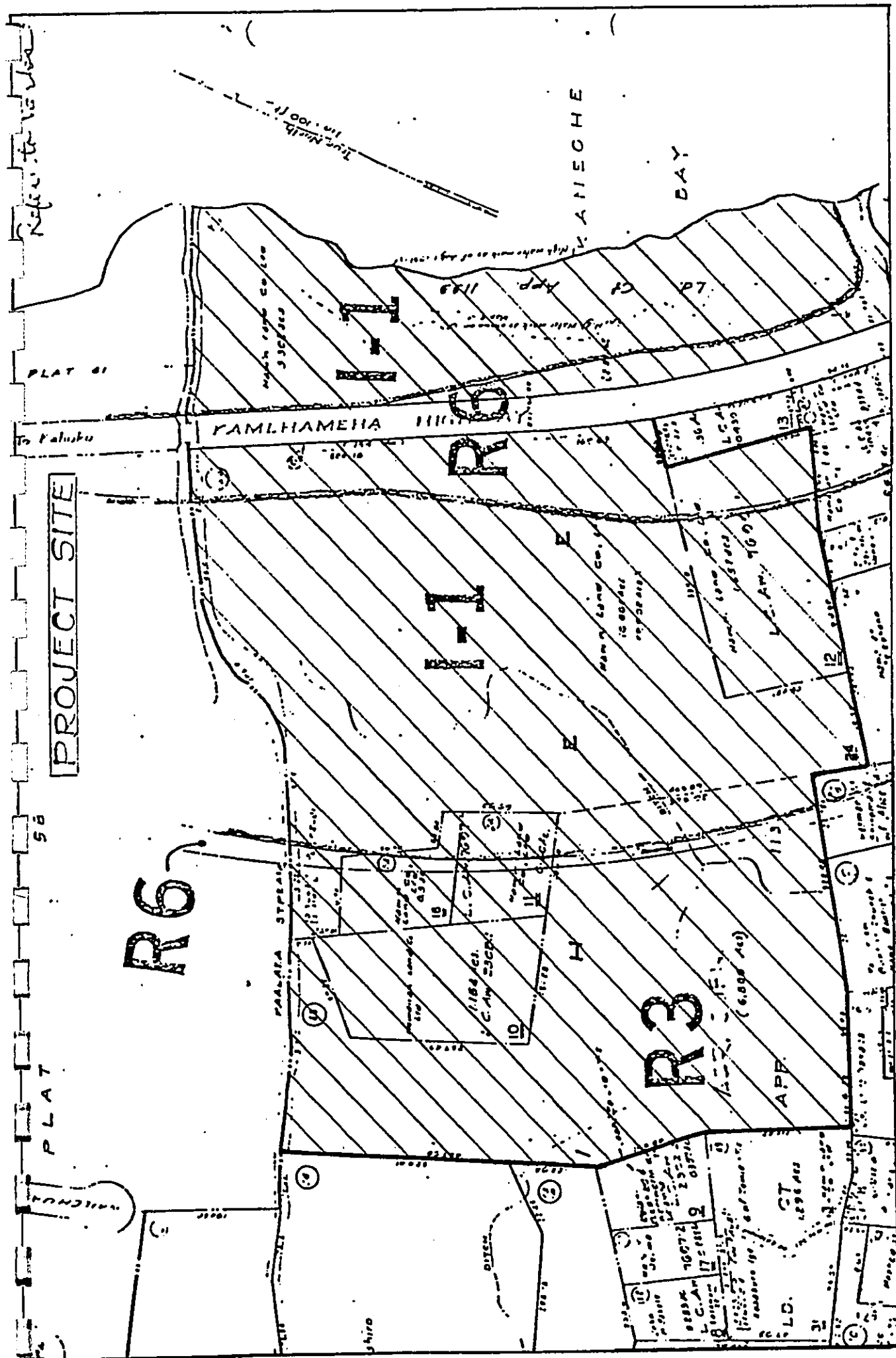


FIGURE 3  
ZONING MAP

TABLE 2  
SUMMARY OF SUBJECT TAX MAP PARCELS\*  
Proposed Kahaluu Industrial Project

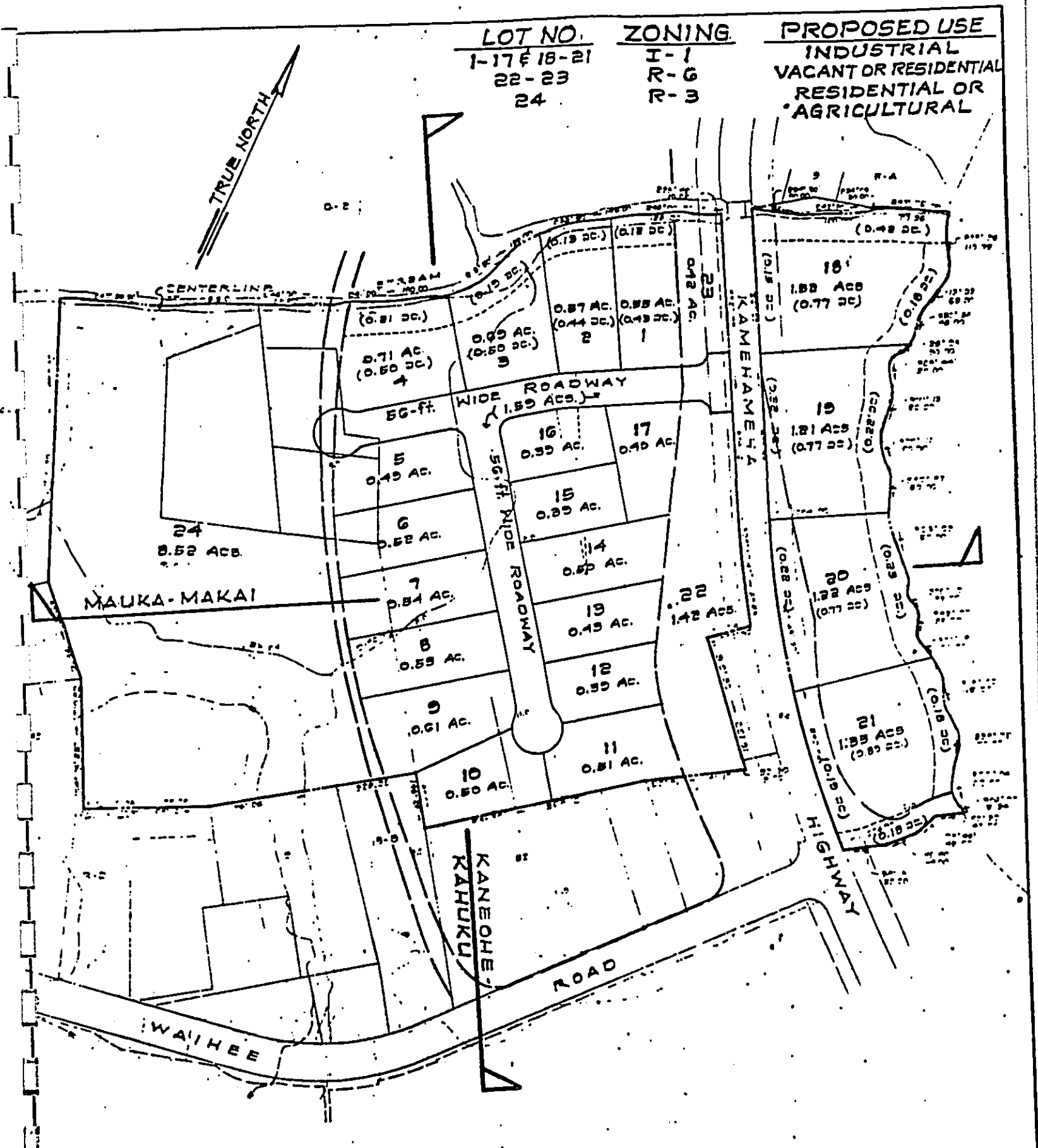
<u>Tax Map Key</u>	<u>Land Area (Acres)</u>	<u>Zoning</u>	<u>Location</u>
4-7-13-1	5.30	I-1 & R-6	Makai
4-7-13-12	1.65	I-1 & R-6	Mauka
4-7-13-24	16.90	I-1, R-3 & R-6	Mauka
4-7-13-10	1.15	R-3	Mauka
4-7-13-11	0.50	I-1, R-3 & R-6	Mauka
4-7-13-16	0.50	I-1, R-3 & R-6	Mauka
Total	26.00		

\* All parcels owned by Alexander & Baldwin, Inc.

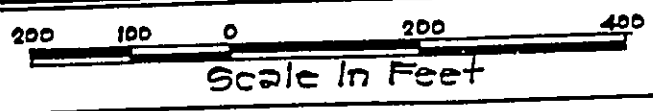
houseslots have been computed based on gross area within zoning the residential district/minimum lot size per zoning district. Allowing for access roadways to residential lots, the maximum number of houseslots will be less than reported above.) The proposed subdivision is illustrated in Figure 4.

The proposed project will include the on-site construction of a roadway system, a drainage system, a collector sewer system and a water system. The project will also provide an on-site sewage treatment plant and effluent disposal system with effluent reused for agricultural purposes or a sewage pump station and force main to convey sewage to the Ahuimanu Sewage Treatment Plant via the Kahaluu Pump Station. Off-site improvements include water system improvements up to the proposed industrial subdivision entrance. The proposed extension of the water system will be under the jurisdiction of the City and County of Honolulu and will, therefore, be installed in accordance with applicable design standards. No structures are proposed to be built in the waters of Kaneohe Bay or within the Shoreline Setback Area, with the possible exception of drainage improvements to the North Waihee Stream channel.

LOT NO.	ZONING	PROPOSED USE
1-17 & 18-21	I-1	INDUSTRIAL
22-23	R-6	VACANT OR RESIDENTIAL
24	R-3	RESIDENTIAL OR AGRICULTURAL



**FIGURE 4**  
**PROPOSED SUBDIVISION**



a. Grading:

The site will be filled to a typical elevation as indicated in Figure 5. Figure 5 depicts two (2) alternative typical fill elevations which are based on drainage considerations. The Preliminary Drainage Study (Appendix B) should be reviewed for the considerations resulting in the two (2) alternatives.

The proposed fill will be transported from a borrow site and placed on the site to the compaction requirements specified by the soils engineer. Typical compaction requirements for mass grading such as proposed is 90 percent. After the fill material is in place, it must be monitored until consolidation settlement has occurred. It is presently anticipated that one to three years will be required to achieve sufficient settling and allow installation of roadway and utility improvements. Alternative No. 1 requires approximately 200,000 cubic yards of fill. Alternative No. 2 requires approximately 50,000 cubic yards of fill.

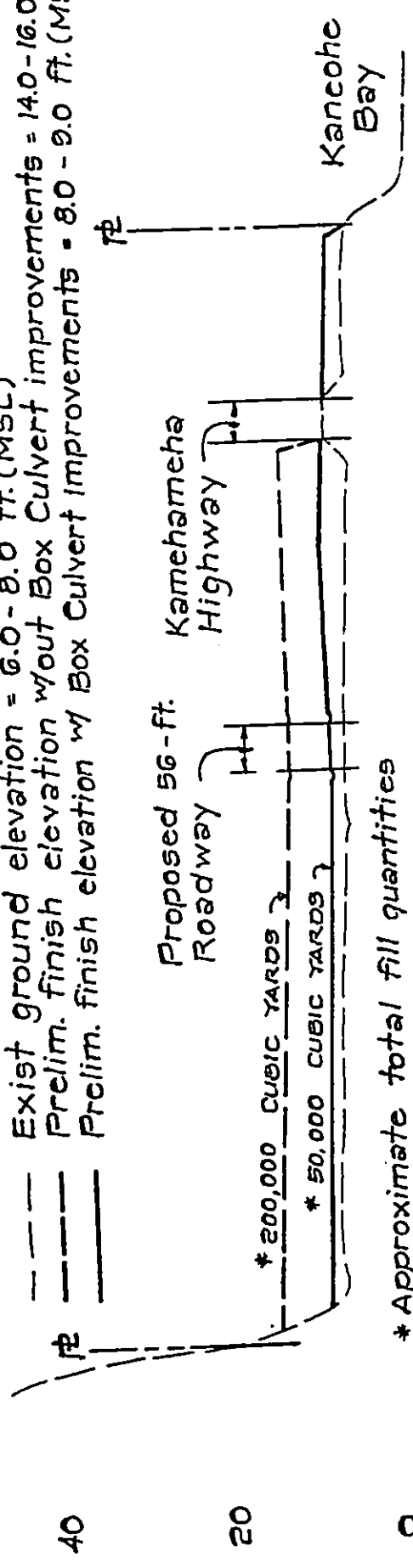
b. Drainage:

The project site borders North Waihee Stream which has a 50-year design storm run-off of 3200 cubic feet per second (cfs). The proposed fill on the site will create a bank adjacent to North Waihee Stream. Figure 6 illustrates a typical schematic section through the mauka portion of the project and the proposed bank. The height of the bank is dependent on drainage improvements to the box culvert under Kamehameha Highway at North Waihee Stream. Two alternatives are presented in the Preliminary Drainage Study (Appendix B). Alternative No. 1 does not propose the box culvert improvement and the typical bank height is approximately 8 feet. Alternative No. 2 proposes replacement of the existing inadequate box culvert and the resulting fill bank height is approximately 3 feet.

The bank height will be sufficiently high enough to allow a design storm of 3200 cfs pass adjacent to the project site as well as allow approximately 2.5 feet of freeboard above the water surface created by the 50-year design storm.

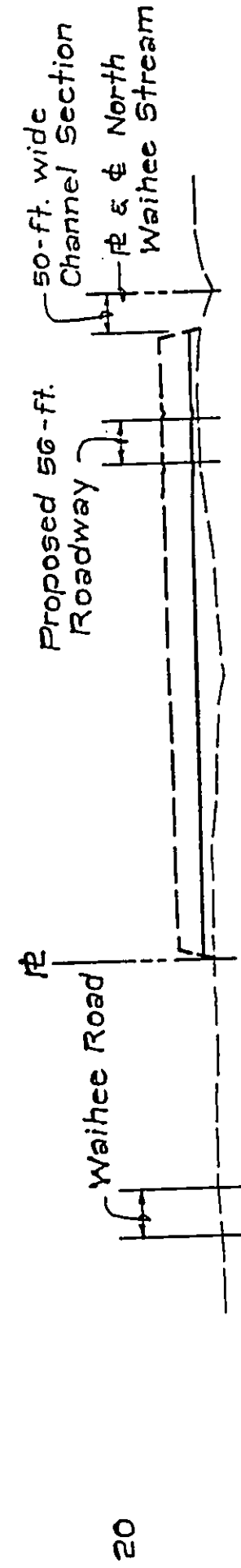
**LEGEND**

--- Exist ground elevation = 6.0 - 8.0 ft. (MSL)  
 - - - Prelim. finish elevation w/out Box Culvert improvements = 14.0 - 16.0 ft. (MSL)  
 - - - Prelim. finish elevation w/ Box Culvert improvements = 8.0 - 9.0 ft. (MSL)



\* Approximate total fill quantities

MAUKA - MAKAI SECTION



KANEOHE - KAHUKU SECTION

**FIGURE 5**  
**TYPICAL SECTIONS THROUGH PROPOSED PROJECT**

Scale: 1" = 200' Hori.  
 1" = 20' Vert.

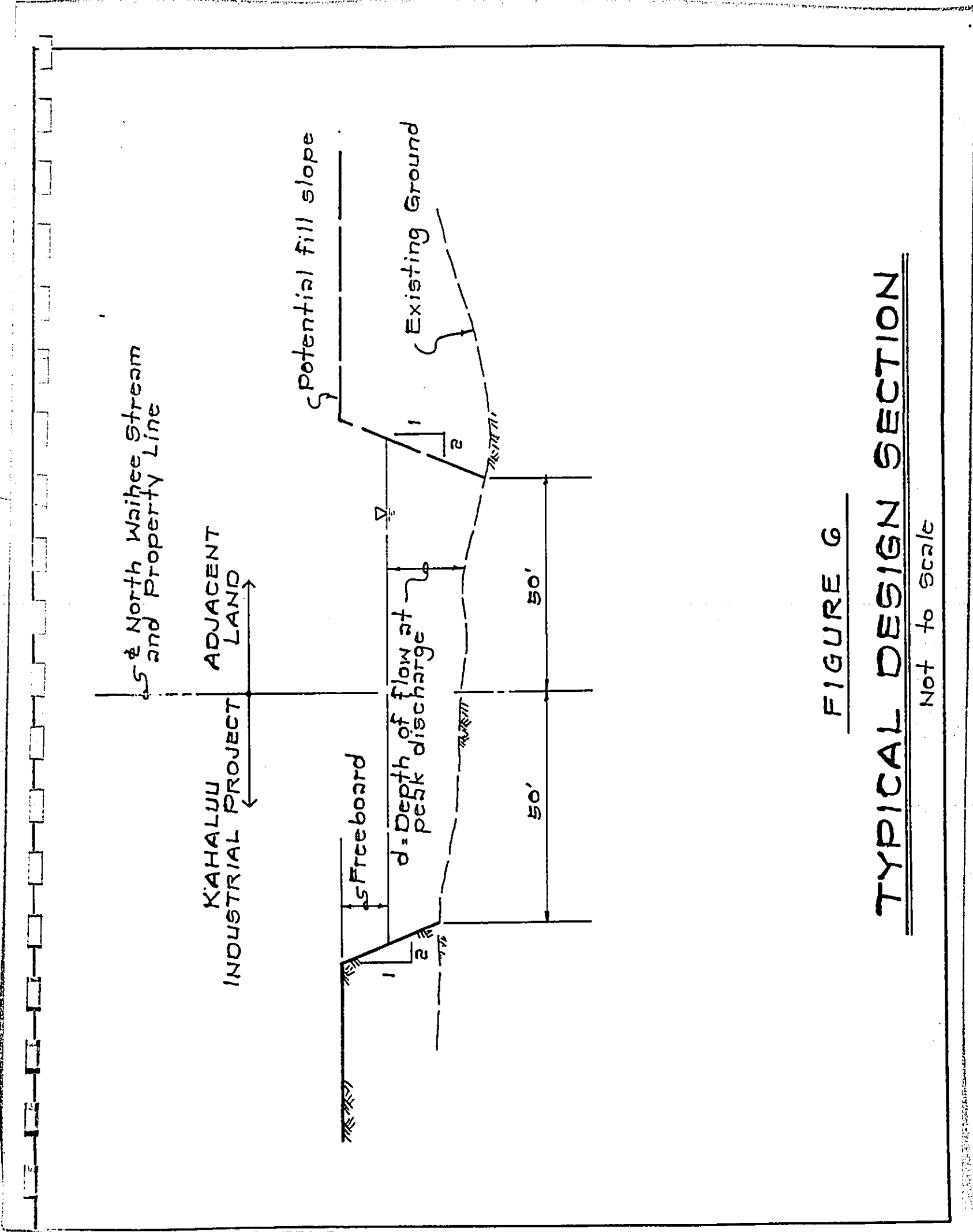


FIGURE 6

TYPICAL DESIGN SECTION

Not to Scale



The Preliminary Drainage Study (Appendix B) examines the North Waihee Stream drainage characteristics and establishes the design parameters for improvements to the North Waihee Stream channel.

Drainage within the actual project site will be disposed of in the North Waihee Stream channel by means of surface swales and by underground drain pipe systems. Typically, lots will be drained toward the roadway by surface swales. Once storm water enters the roadway, catch basins and reinforced concrete pipe will transport all drainage to North Waihee Stream. The lots makai of Kam Highway will drain towards Kaneohe Bay by surface swales.

c. Roadways:

The proposed light industrial (I-1) subdivision will create 1100 linear feet of 56-foot wide right-of-way (see Figure 4 - Proposed Subdivision) containing full roadway improvements in accordance with the Subdivision Rules and Regulations of the Department of Land Utilization and Standard Details for Public Works Construction of the City and County of Honolulu. The pavement width of the roadway will be 40 feet with an 8-foot wide shoulder on each side of the roadway containing sidewalks. The entrance to the project site is 800+ feet away from the intersection of Waihee Road and Kamehameha Highway.

The project may also require improvements to Kamehameha Highway to provide storage lanes (left-turn from Kamehameha Highway into project), an acceleration lane and a deceleration lane. These improvements will be installed in accordance with the requirements of the State of Hawaii Department of Transportation.

d. Water Supply:

Adequate water must be distributed through the project for both domestic needs as well as fire protection. Preliminary calculations estimate the domestic consumption for the entire project (proposed light industrial subdivision as well as potential R-3 and R-6 residential subdivision) at approximately

100,000 gallons per day. The required flows for fire protection for residential development and light industrial development are 1000 gpm and 4000 gpm, respectively. Therefore, preliminary review indicates the main water distribution system within the project will be a 16-inch diameter pipe system to supply the required fire flow. Water laterals will be provided to each lot for domestic consumption.

Water will be made available to the site either by existing sources (wells and tunnels) and the existing transmission system within Kamehameha Highway or by development of a new source and additional transmission system. Any new source will be connected to the existing Windward water transmission system. A determination of the specific method to make water available to the site will be made based on a review of the water master plan for the area. A water master plan will be prepared by the developer's engineering consultants.

Unlike the Pearl Harbor basin and Honolulu which lack excess water resources, there is additional water available within Windward Oahu which has not been developed as a source of water supply. The purpose of the water master plan is to determine the adequacy of the existing water system in relation to the proposed project and to determine to what extent additional facilities are necessary to maintain adequacy in the system. If the Board of Water Supply has projects proposed which will develop sources that can adequately serve the project, the Kahaluu Industrial Subdivision will most probably be required to pay a proportional share of the source development. In addition to the source development changes, the developer would also pay for any improvements required to convey water to the proposed subdivision. If the Board of Water Supply does not have projects proposed which can adequately supply water to the project, then the developers may have to commit to installing an additional source development system, storage system and transmission system which will connect to the existing transmission system. The latter option will require an additional environmental impact statement to address the source development and storage system.

e. Sanitary Sewage Disposal:

The project will ultimately generate sewage from the industrial portion of the project as well as from the residential portion of the project if developed. The proposed amount of development is contingent upon the method of sewage treatment which will be utilized. There are two (2) alternatives for sewage treatment. These are:

Alternative No. 1 - Collect and transport all sewage to the Ahuimanu Sewage Treatment Works via the Kahaluu Sewage Pump Station. The proposed Kahaluu Residential and Commercial Development located just south of the Kahaluu Industrial Project also proposes this method of sewage treatment and therefore, it may be possible that both projects could utilize the same force main. This alternative must be reviewed and approved by the City and County of Honolulu, Department of Public Works.

Alternative No. 2 - Collect and treat all sewage on-site with ultimate reuse of treated sewage effluent as irrigation water for agriculture. The area which would be maintained in agriculture is the 8.0± acre residentially (R-3) zoned portion of the project site. As with Alternative No. 1, an on-site collector system and private pump station would be required to deliver sewage to the treatment works. However, the treatment works would be located on site.

Additional facilities which would be necessary to implement effluent irrigation system are a 10±-day capacity holding tank for retention of effluent during rainfall periods and an irrigation network. This alternative will be designed to comply with the regulations of the State of Hawaii Department of Health.

The average design flows for the two sewage treatment alternatives are illustrated in Table 3 below:

TABLE 3

Average Daily Sewage Generation  
Kahaluu Industrial Project

<u>Alternative</u>	<u>Generation Factor</u> (gal/acre/day)	<u>Total</u> (gpd)
<b>No. 1 - Ahuimanu Treatment Works</b>		
Industrial Subdivision (14.0+ acres)	2000 - 4000	28,000 - 56,000
Residential (68 lots)	400*	<u>27,000</u>
	Total	53,200 - 79,200
<b>No. 2 - On-site Treatment</b>		
Industrial Subdivision (13.0+ acres)	2000 - 4000	28,000 - 56,000
Residential (0 lots)	400**	<u>--0--</u>
	Total	26,000 - 56,000

\* The maximum number of residential lots in both R-3 and R-6 zoning districts. However, as reported early, Alexander & Baldwin, Inc. does not envision lot development on R-6 zoning district. For the purpose of anticipating the worst environmental impacts, the maximum number of lots has been reported.

\*\* gal/lot/day

Should Alternative No. 2 be utilized, sludge disposal will be accommodated by means of mechanical sludge dewatering and ultimate disposal in one of the City and County approved landfills or by transportation of digested sludge to one of the City and County treatment works for dewatering and ultimate disposal. A certified operator will be retained to comply with Article 340 B-6 of the Hawaii Revised Statutes.

The method of sewage treatment will have to be resolved prior to approval of Special Management Area Use Permit (SMP).

f. Telephone and Electrical Services

There is existing telephone and electrical service in the area such that service can readily be extended. Aerial telephone and electrical lines are located adjacent to Kamehameha Highway and Waihee Road. The telephone and electrical lines serving the project will be connected with the main overhead lines on Waihee Road. All electric and telephone systems for the proposed project will be underground.

g. Landscaping:

The proposed project will create lots which will be grassed. After completion of the subdivision, lessees or owners will develop plot plans with landscaping as desired and in accordance with the Comprehensive Zoning Code (CZC). With respect to the CZC, landscaping requirements for an industrial subdivision specifically call for landscaping and buffering to minimize potential adverse influences on property in the same or neighboring zoning districts.

The landscaping requirements vary based on the permitted uses; however, landscaping is required where light industrial lots adjoin residential districts without an intervening street or buffer zone and also within setbacks of lot lines adjacent to streets. It is intended that the developer will also establish landscaping requirements for the subdivision in the form of covenants and restrictions.

2. Economic Characteristics

The proposed project will offer the surrounding community employment opportunities in the service facilities and businesses attracted to the light industrial subdivision. The proposed project will generate employment opportunities in service-oriented trades for maintenance of residences and possibly agriculture, depending on which alternative use is implemented on the R-3 residentially zoned portion of the site. Immediate economic effects would be felt by the larger community through the infusion of circulating dollars into the community during the construction life of the project. This phase of the project will also provide employment for people associated with the handling and purchasing of construction materials.

A Market Study (see Appendix I) completed by Cowell & Co., Inc., Real Estate Consultants, reports there is a demand and market for industrially zoned lands to establish service/business operations in the Kahaluu area. In addition, the owners of the land, Alexander & Baldwin, Inc., report that they have received several requests from various entities to obtain and develop sites on their industrially zoned land in Kahaluu.

The construction cost of the proposed project is estimated at 5.0+ million dollars.

3. Social Characteristics

The proposed project will expand the business-oriented and consumer service-oriented characteristics of the area. It is further anticipated that employment opportunities closer to home (in comparison to the traditional business centers of Honolulu, Kailua Town and Kaneohe Town) will increase employment in the area. It is estimated that the 14.0± acre industrial subdivision can generate between 150 and 170 jobs.

In addition, should the R-3 residential subdivision be realized, new homes will be erected. The resulting social characteristics of additional housing will produce more of a residential character in the area.

4. Environmental Characteristics

The proposed development is located on low-lying land of mostly flat terrain except for the southwestern portion of the site. Two distinct, yet related, physical settings are exhibited within the boundaries of the subject site. The makai subject is covered with hau to the shoreline, where a mangrove swamp replaces the hau. The mauka section contains a large portion of Waihee Marsh which is mostly overgrown with California grass, arrowhead and great bulrush. The areas that border the southeastern and mauka boundaries of the project site have been previously urbanized. As stated earlier, a Hawaiian Telephone transfer station, a Hawaiian Electric booster station, a Board of Water Supply pumping station, residential structures and a church lie adjacent to the southeastern boundary of the mauka section. Mauka of the site are several residential structures. Land alteration will change the site from undeveloped vacant land to a mix of light industrial and either residential or agricultural uses. The 21-lot industrial subdivision will contain paved roadways, drainage and water systems, and a sewage disposal system.

Sewage disposal is of primary concern in this area due to impermeable soil conditions and high water table. The exact method of sewage disposal for the proposed project must be examined and given approval by the City and County of Honolulu Department of Public Works (DPW) and the State of Hawaii Department of Health (DOH) prior to the approval of a Special Management Area Use Permit (SMP).

The project is located in Waihee drainage basin which discharges into Kaneohe Bay. Kaneohe Bay is classified by the DOH as having Class AA waters; therefore, drainage is a concern. Tax Map Key Parcels 4-7-13:1, 10, 11, 12, 16 and 24 are located within wetlands as designated by the U.S. Army Corps of Engineers. The Corps of Engineers has made a determination that the subject project area contains a coastal wetland and requires a Department of the Army permit to place fill within these wetlands.

D. USE OF PUBLIC FUNDS OR LANDS FOR THE ACTION

No public funds or lands will be used for the action. The proposed alternative off-site sewer force main will be installed within public streets.

E. PHASING AND TIMING OF ACTION

It is anticipated that mass grading and drainage improvements may commence in late 1982 or 1983. Site improvements may begin in the year 1985. The estimated time required for construction of the proposed site improvements is about 12 months. Therefore, it may take four (4) to six (6) years to complete the project.

F. SUMMARY TECHNICAL DATA

1. U.S. Department of Agriculture, Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii," U.S. Government Printing Office, Washington, D.C., August, 1972.
2. Munekiyo, Michael T., "The Use of an Environmental Performance Standard in Management of Storm Runoff from Urbanizing Hawaiian Watersheds," Hawaiian Environmental Simulation Laboratory Technical Report No. 4, University of Hawaii, May, 1976.
3. Cox, Doak C., et al, "Estuarine Pollution in the State of Hawaii," Water Resources Research Center Technical Report No. 31, University of Hawaii, November, 1973.
4. Honolulu Department of Housing and Community Development, "Community Data Book," Honolulu, 1981.
5. Department of Planning and Economic Development, "State of Hawaii Data Book," Hawaii, 1980.

6. Department of Geography, University of Hawaii, "Atlas of Hawaii," University Press of Hawaii, 1973.
7. Elliott, Margaret E., et al, "Wetlands and Wetland Vegetation of Hawaii," United States Army Corps of Engineers, Pacific Ocean Division, Hawaii, September, 1977.
8. Office of Air and Waste Management, Office of Air Quality Planning Standards, "Guidelines for Air Quality Maintenance Planning and Analysis Volume 9: Evaluating Indirect Sources," U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, January, 1975.

G. HISTORIC PERSPECTIVE

Alexander & Baldwin, Inc. acquired this property in March, 1971. The intent of this purchase and subsequent payments of real property taxes were based on planned development conforming to the existing zoning and General Plan designations of the site.

Many changes in land use have occurred in the area where the project site is located. During various times in history, the area produced taro, rice, sugar and pineapple. By the 1930's, many acres were used for cattle grazing or fell to disuse. Housing demand has stimulated the expansion in new housing developments to rural areas such as Kahaluu. Existing land uses in the area include a mixture of residential, industrial, commercial and small-scale agricultural uses.



III. THE RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

A. STATE LAND USE DESIGNATION

The State Land Use designation for the project site and the surrounding area is "urban." This designation gives the county jurisdiction in further zoning this land to allow a variety of urban uses including the proposed mix of light industrial and either agricultural or residential use.

B. HAWAII STATE PLAN

The Hawaii State Plan identifies the goals, objectives and policies of the State to serve as a guide for future development. While the State Plan objectives are broad and cover a wide range of issues, these objectives will be further defined by State Functional Plans. To date, these Functional Plans are still in the process of being formulated and none have yet been adopted. The following are the relevant objectives and policies of the Hawaii State Plan and a discussion of how the proposed action relates to them:

Economy:

Objective (a) (2) - "Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people."

In addition to the immediate infusion of circulating dollars into the community during the construction life of the project, the project will generate employment opportunities by the businesses attracted to the light industrial subdivision.

Scenic, Natural Beauty, and Historic Resources:

Policy (b) (4) - "Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage."

An archaeological reconnaissance was conducted to verify the existence or absence of any artifacts (see Appendix C). In summary, it was determined that there are no above-ground archaeological features nor any indication that significant features lie buried

beneath the subject parcel. However, if any unanticipated sites or remains are encountered, the contractor will contact the State of Hawaii, Historic Sites Section.

Solid and Liquid Wastes:

Objective (a) (1) - "Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes."

There are two (2) proposed alternatives for sewage treatment. Prior to the approval of a Special Management Area Use Permit (SMP), these two alternatives must be reviewed and approved by the appropriate government agencies.

Water:

Policy (b) (3) - "Reclaim and encourage the productive use of runoff water and waste water discharges."

The second proposed alternative of sanitary sewage disposal involves the collection and treatment of all sewage on-site with ultimate reuse of treated sewage effluent as irrigation water for agriculture. This alternative would alleviate the permanent demand on the Island's finite water supply presented by the potential agricultural usage on the residentially zoned portions of the site.

Transportation:

Policy (b) (10) - "Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment."

Both on-site and off-site roadway designs must be reviewed, approved and implemented that will provide transportation improvements in accordance with both City and County and State transportation agencies.

C. ZONING - CITY AND COUNTY OF HONOLULU

There are three different zoning designations within the project site, i.e., I-1 Light Industrial, R-6 Residential District, and R-3 Residential District. The proposed action is consistent with the existing zoning of the site. Figure 3 (Zoning Map) and Table 2 of Section II illustrate and summarize the zoning for the project, respectively.

D. THE GENERAL PLAN - CITY AND COUNTY OF HONOLULU

The General Plan identifies the long-range planning objectives and policies which the City and County government hopes to actualize for the benefit of the people of Oahu. The General Plan contains objectives and policy statements which address 9 different areas of concerns. A single project such as the proposed action can only be related to such a document in a very general way; the following is a discussion of the relevant objectives and policies and how the project relates to them:

1. Population:

Policy C-3 - "Reduce, or at most maintain, the 1975 proportions of the Islands' rural and urban-fringe populations."

The project site is located in the general rural area identified in the General Plan as Kahaluu-Kahuku (Census Tracts 101 and 102). In 1975, the population of Kahaluu-Kahuku was 14,890 or 2.1 percent of the total Oahu 1975 population of 704,403. In 1979, the population of Kahaluu-Kahuku was 13,287 or 1.8 percent of the 1979 Oahu population of 729,084. In 1985, the population of this general rural area is projected to be 15,182 or 1.9 percent of the project Oahu 1985 population of 802,749. It is readily apparent that that population trend for Kahaluu-Kahuku is consistent with the General Plan's population-distribution policy.

2. Economic Activity:

Objective A - "To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living."

Jobs will be provided by the project during construction as well as throughout the useful life of the subdivision.

Policy G-3 - "Maintain sufficient land in appropriately located industrial areas to help ensure a favorable business climate for Oahu's industries."

The proposed action would result in the utilization of the project site in accordance with its zoning. No rezoning is necessary. The mixed use of the site should be appropriate with the existing mixture of industrial and residential uses in the

surrounding area. Presently, there is a limited supply of vacant zoned land for industrial use on the Windward side. The proposed action should help support a favorable business climate for Oahu's industries.

3. Natural Environment:

Policy A-5 - "Design surface drainage and flood-control systems in a manner which will help preserve their natural settings."

The existing natural drainage system presently carries stormwater through the project site and will continue to perform the same function with the proposed improvements. It is intended to preserve the natural setting as much as allowed within the context of the drainage standards. This concept is beneficial with respect to the environment as well as economics.

4. Transportation and the Utilities:

Policy B-5 - "Provide safe and efficient waste-collection and waste-disposal services."

Sewage disposal is of primary concern in this area due to impermeable soil conditions and high water table. The general area is not connected to the municipal sewage treatment system and is served by cesspools. The exact method of sewage disposal for the proposed project will be examined and given approval by the City and County of Honolulu Department of Public Works (DPW) and the State Department of Health prior to the approval of a Special Management Area Use Permit. The City and County of Honolulu has completed preliminary studies regarding a sewer system in this general area.

Policy B-6 - "Encourage the recycling of solid-waste materials and waste water."

Of the two alternatives which are proposed by the applicant for the disposal of waste water, one alternative is the construction of a sewage treatment plan, with the resultant effluent used for agricultural purposes.

Policy D-3 - "Evaluate the social, economic, and environmental impact of additions to the transportation and utility systems before they are constructed."

This EIS will address the above-mentioned concerns and mitigating measures as the project is assessed pursuant to Chapter 343, Hawaii Revised Statutes and the Environmental Impact Statement Regulations, as directed by Ordinance 4529.

Policy D-5 - "Require the installation of underground utility lines wherever possible."

All utility lines will be installed underground.

5. Physical Development and Urban Design:

Policy A-2 - "Locate new industries and new commercial areas so that they will be well related to their markets and suppliers, and to residential areas and transportation facilities."

Some of the lots in the industrial subdivision could be used to provide an outlet for local agricultural goods produced in the region. In addition, needed warehouse space and service facilities to support existing and future shopping centers could be constructed on the remainder of the lots. In any event, it is anticipated that the windward Oahu working force will obtain a benefit with employment opportunities closer to home.

6. Public Safety:

Policy B-5 - "Require all development in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard."

The project site drainage system will be designed and constructed according to the Drainage Standards of the City and County of Honolulu Department of Public Works. The proposed drainage system will adequately mitigate potential flood hazard affecting safety and property. The site is directly adjacent to Kaneohe Bay; however, the reef protection of the bay prevents large tidal fluctuations which are associated with tsunami inundation.

Policy B-8 - "Provide adequate fire protection."

In their written consultation comments on the proposed project the Fire Department indicated that they had no objections to the proposed project. They also provided the information that Kahaluu Fire Station is less than a mile away from the proposed project, with supportive fire service to be provided by Kaneohe and Kaaawa Fire Stations. An adequate water system approved by the Board of Water Supply must also be implemented.

Policy A-2 - "Identify and preserve areas of unique social and cultural significance."

An archaeological/historical reconnaissance (Appendix C) of the project was conducted to verify the existence or absence of artifacts due to the fact that this area was once the site of intense taro production. The archaeologist has determined that there are no above-ground archaeological features nor any indication that significant features lie buried underneath the subject parcel. If any unanticipated sites are encountered, the contractor will contact the Division of State Parks, Historic Sites Section.

The existing General Plan Detailed Land Use Map (DLUM) illustrated in Figure 7 designates the project site for light industrial and residential uses.

E. PROPOSED DEVELOPMENT PLAN - CITY AND COUNTY OF HONOLULU

The Development Plan designation for the area is at present unresolved. It appears that the earliest the plan will be available for review is March, 1982. In the mean time, the DLUM designation of Light Industrial and Residential are still the standard with respect to the General Plan. Figure 8 represents the Development Plan recently prepared and not adopted by City Council.

F. SPECIAL MANAGEMENT AREA

As stated previously, a portion of the project site is located within the Special Management Area (SMA) (see Figure 9 - SMA Map). Since the proposed action involves construction within the SMA, a Special Management

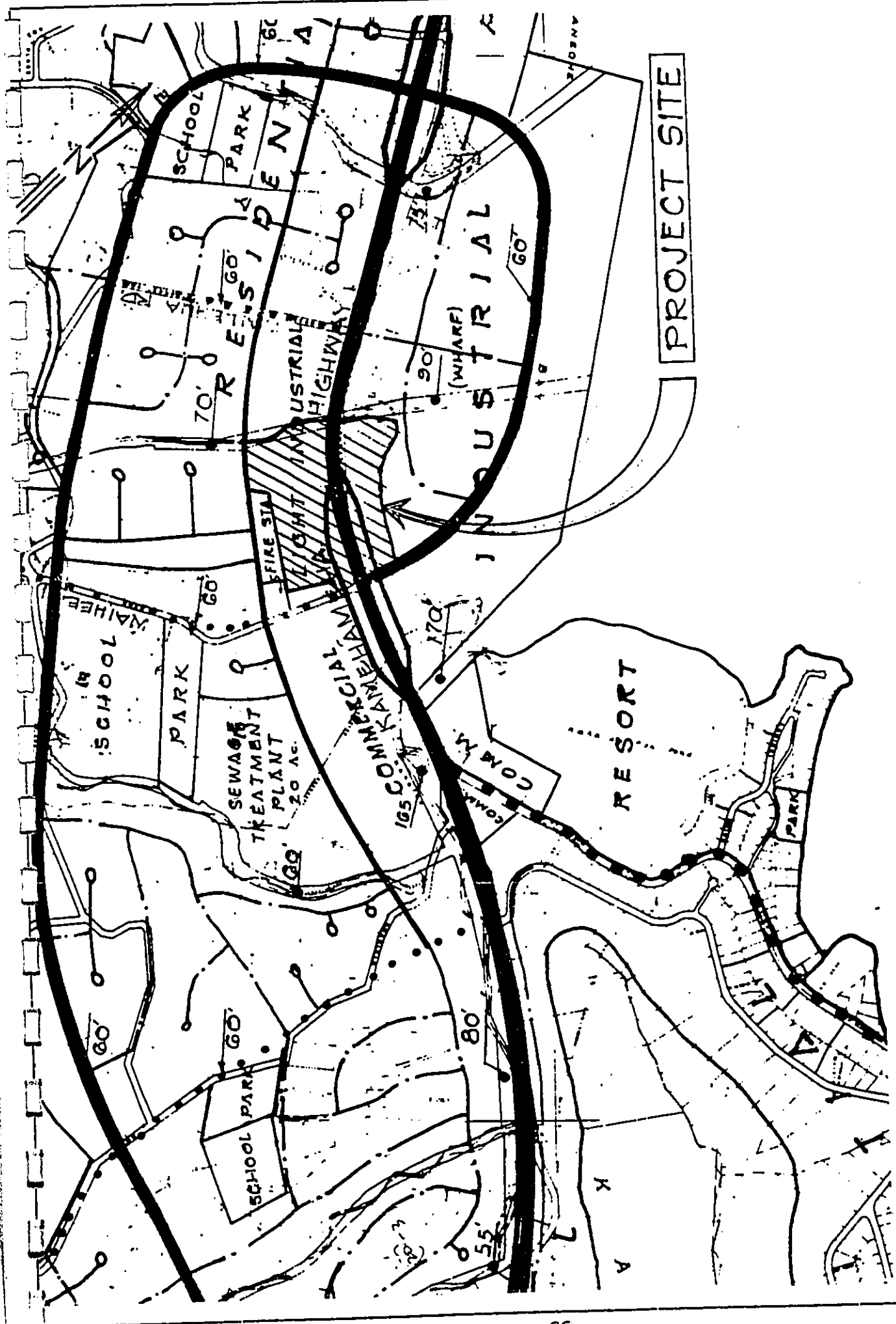


FIGURE 7

DETAILED LAND USE MAP

Scale: 1" = 800'

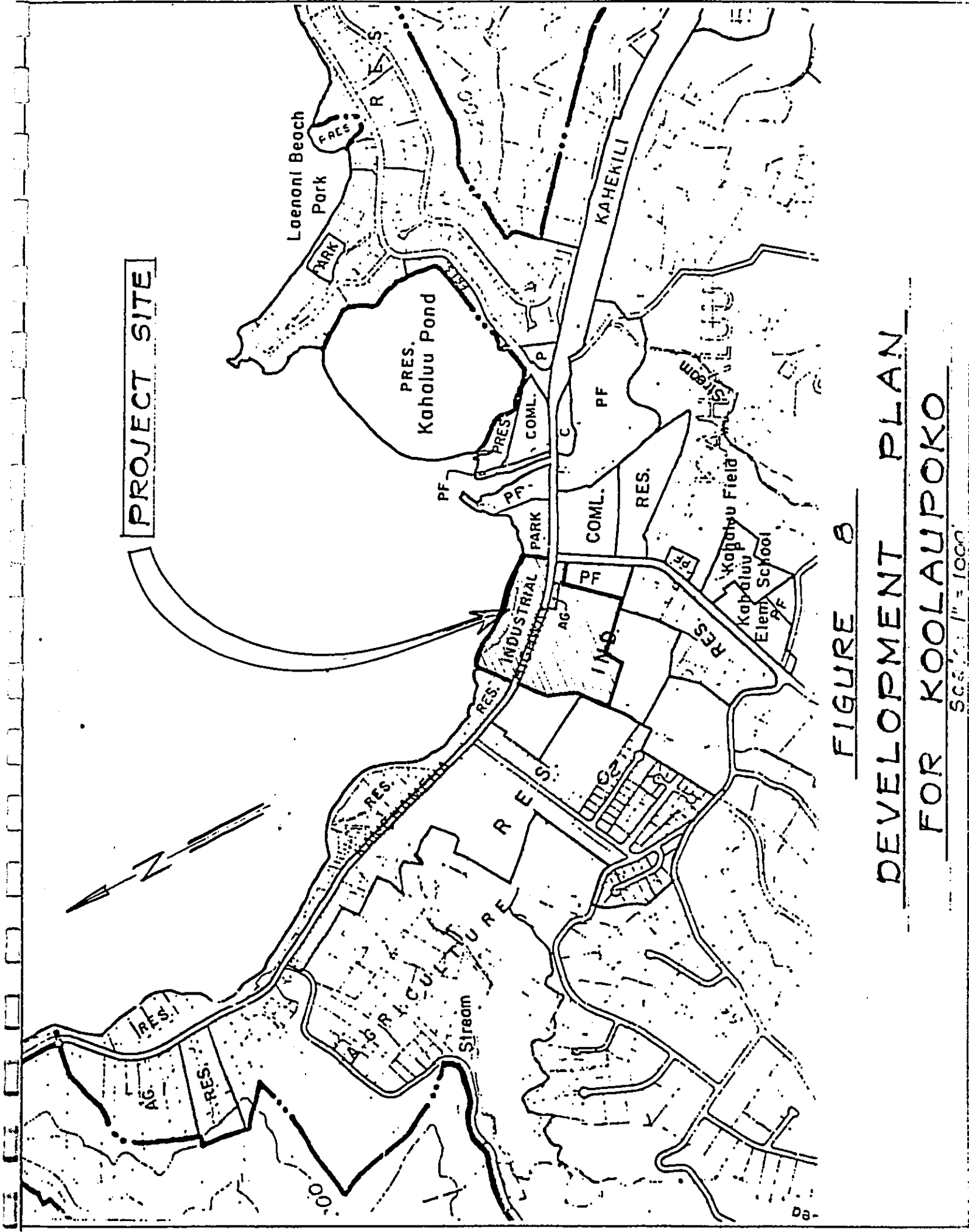


FIGURE 8  
 DEVELOPMENT PLAN  
 FOR KOOLAUPOKO  
 Scale: 1" = 1000'



Area Use Permit is required prior to tentative subdivision approval and construction. In compliance with Ordinance No. 4529, an accepted EIS which addresses the significance of the proposed project within the SMA will be submitted concurrently with the SMA permit application.

G. HAWAII COASTAL ZONE MANAGEMENT (CZM) PROGRAM

The objectives of the Hawaii Coastal Zone Management Program (Chapter 205A, Hawaii Revised Statutes) are to protect valuable and vulnerable coastal resources such as coastal ecosystems, special scenic and cultural values, and recreational opportunities. They are also intended to reduce coastal hazards and to improve the review process involving development activities.

No improvements of the proposed project are proposed with the shoreline setback as defined by the Special Management Area setback requirements with the possible exception of North Waihee Stream channel improvements discussed in Section II.C.1.b. (Drainage).

The following are the objectives of the Hawaii Coastal Zone Management Program and how the project relates to them:

1. Recreational Resources:

"Provide coastal recreational opportunities accessible to the public."

Recreational activities normally associated with the shoreline are bathing, swimming, beaching and boating. The shoreline fronting the project consists of shallow mudflats which are unsuitable for the preceding recreational activities. Coastal recreational opportunities in the form of fishing, crabbing, and netting have historically occurred in this area.

2. Historic Resources:

"Protect, preserve, and, where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture."

An archaeological reconnaissance (Appendix C) of the project was conducted to verify the existence or absence of artifacts due to the fact that this area was once the site of



intense taro production. In summary, it was determined that the site contains no above-ground archaeological features nor any indication that significant features lie buried underneath the subject parcel. However, if any unanticipated sites are discovered, the contractor will contact the Division of State Parks, Historic Sites Section.

3. Scenic and Open Space Resources:

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

In its present state, the makai section is covered by hau and mangrove. The mauka section is mostly overgrown with introduced grasses. As seen from Kamehameha Highway, the vegetation on the makai section create an effective visual barrier of Kaneohe Bay. The proposed clearing and grading activities will temporarily improve coastal open space and scenic resources. However, the eventual construction of structures on the mauka section will not improve open space and scenic resources. Shoreline Setback Rules and Regulations, Shoreline Access Rules and Regulations, Comprehensive Zoning Code Landscaping Requirements as well as Park Dedication requirements will enhance this CZM objective if development occurs.

4. Coastal Ecosystems:

"Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems."

The proposed drainage system will be submitted to the State Department of Health for review and approval with respect to water quality effects on Kaneohe Bay. Negligible impact is anticipated based on the size of the project with respect to the Kaneohe Bay watershed and the North Waihee Stream drainage basin (see Appendix D).

5. Economic Uses:

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

The proposed action is consistent with the present land use designation and zoning for the project site. In addition, the proposed action is similar to that of the existing uses in surrounding area. Uses include: two service stations, a drive-in restaurant, bank, truck storage, bus yard, shops; and adjacent to the site: Hawaiian Telephone transfer station, Board of Water Supply pumping station, and a Hawaiian Electric booster station. The proposed action would provide sizable vacant land for light industrial use on the Windward side. A Market Study (Appendix I) prepared for this document reports that there are virtually no vacant industrially zoned lands in Kaheohe and Kailua towns. In addition, of the approximately 35.0± acres of industrially zoned land in the Kahaluu area, only two (2) sites have attractive potential for the creation of an industrial subdivision. The project will contribute to the economy by providing industrial space.

6. Coastal Hazards:

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

The project will be designed and constructed in compliance with the requirements of the Federal Flood Insurance Program, the City and County of Honolulu Drainage Standards, and Grading Ordinance. The site is not subject to significant flood erosion and subsidence hazard. As indicated on Figure 10, the project site is located within Zones A and C of the Flood Insurance Rate Map. Zone A indicates flooding occurs as a result of stormwater runoff and Appendix B (Preliminary Drainage Study) preliminarily establishes a 100-year flood inundation level. Zone C typifies areas of minimal flooding. The project site is not within Zone V which confirms the area is not subjected to coastal flooding or wave hazard. Therefore, even though the site is directly adjacent to Kaneohe Bay, reef protection of the bay prevents large tidal fluctuations which are associated with tsunami inundation and storm waves.



7. Managing Development:

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

This EIS was written to communicate the potential impacts of the proposed project in order to facilitate public participation in the review and management of coastal resources and hazards.

H. DEPARTMENT OF THE ARMY WETLAND REGULATIONS

The Corps of Engineers has made a determination that the project site area contains coastal wetlands and that a Department of the Army (DA) permit must be processed. Figure 11 locates the project site with respect to the coastal wetlands and the Waihee Marsh area. Content requirements of the DA permit are construction plans of sufficient detail to clearly define the scope of work as well as an assessment of the environmental concerns of the proposed project with respect to the designated wetlands.

The purpose of a Department of the Army permit is to allow for environmental evaluation to ensure that potential valuable wetland resources are not destroyed. The information presented within this EIS discusses a majority of the environmental concerns which must be evaluated in the DA permit process.

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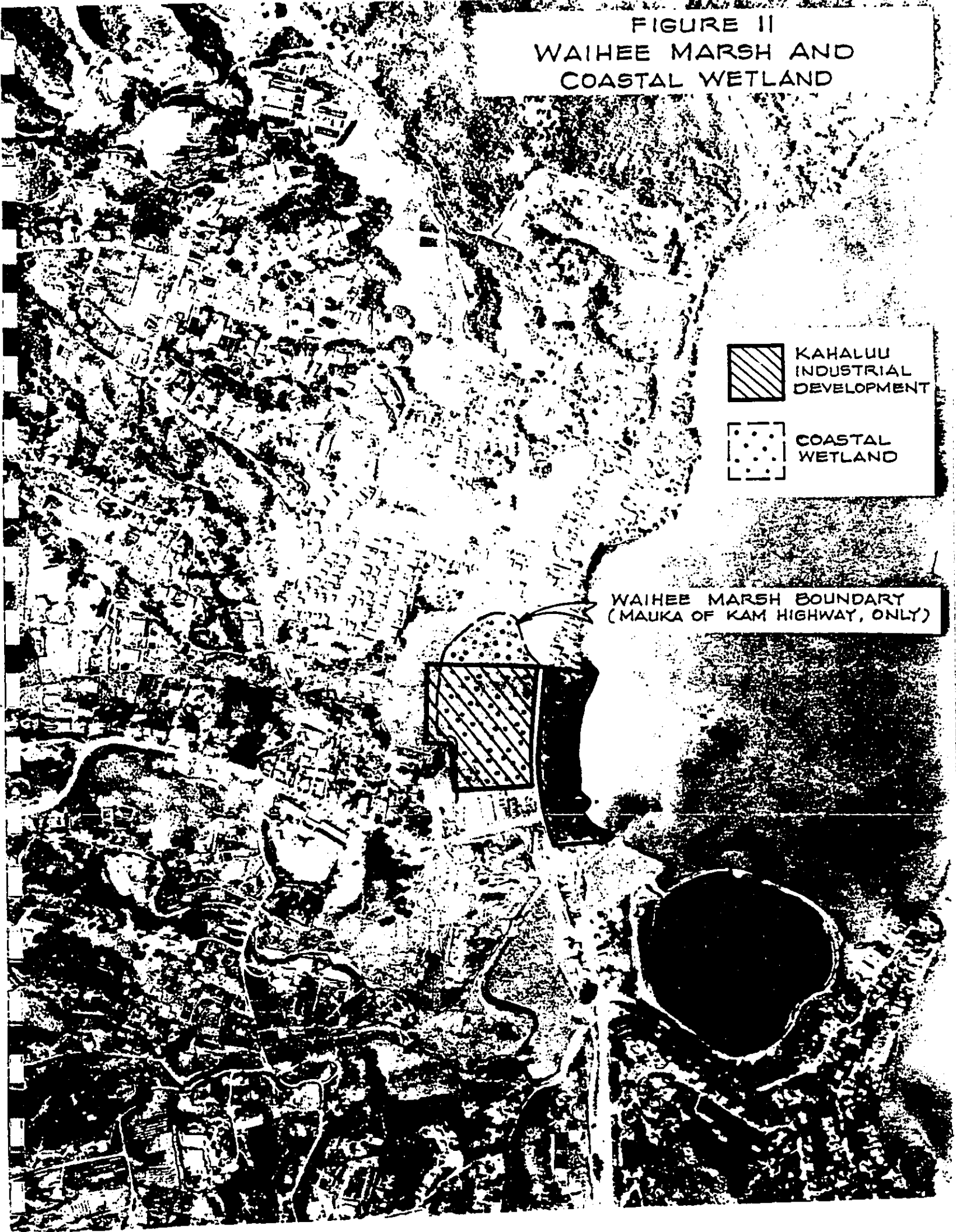


FIGURE II  
WAIHEE MARSH AND  
COASTAL WETLAND

- KAHALUU INDUSTRIAL DEVELOPMENT
- COASTAL WETLAND

WAIHEE MARSH BOUNDARY  
(MAUKA OF KAM HIGHWAY, ONLY)

IV. DESCRIPTION OF THE ENVIRONMENTAL SETTING AND THE PROBABLE IMPACT OF THE PROPOSED ACTION

A. PHYSICAL AND CHEMICAL CHARACTERISTICS

1. Physical Geography - Windward Oahu generally consists of steep cliffs of the Koolau mountain range which generally flatten to the coastal plains adjacent to Kaneohe Bay. The project site is located directly adjacent to Kaneohe Bay on coastal plains consisting of alluvial deposits. From a physical viewpoint the site is for all practical purposes nearly level, poorly drained and predominantly overgrown in California grass. The proposed project will elevate the site by means of fill and retain the nearly level profile of the site, except for that as needed to provide drainage. The project will further replace all existing introduced vegetation characteristic of saturated soils, with other forms of introduced vegetation. The forms of replacement vegetation will predominantly consist of grasses and landscaping typically used for aesthetic and decorative purposes. Should effluent from an on-site sewage treatment plant be utilized, the rear portion of the property (R-3 residential portion) could most likely support a commercial nursery or other agricultural uses. From a purely physical perspective, the impact of filling the site will have minimal impact. However, the related impacts on drainage/water quality, flora, fauna and agriculture are discussed later within this section.

2. Soils - The soils of the Koolau coastal plains generally consist of the Kaena-Waiialua and Lolekaa-Waikane Soil Associations. However, the predominant soils of the project site are identified as Tropoquetts. As identified by the Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, these soils are poorly drained and are periodically flooded by irrigation in order to grow crops. Further, the soil development is dependent on length of time that the area has been flooded. Typically, the soil profile consists of mucky silt loam overlaying silty clays and alluvial material. Tropoquetts are used for the production of taro, rice and watercress and it is common knowledge that in the past taro was extensively grown in the area and on the site.



The proposed project will cover the site with fill material most probably consisting of Lolekaa silty clays. This soil series is the most readily available fill material at known borrow sites and is one of the most common soil types of Windward Oahu. Lolekaa silty clays make relatively good fill material from the aspect of compaction which is essential for lot development.

The proposed filling of the site will have minimal impact on the existing Tropoquets. However, the related impacts on drainage-related water quality, flora, fauna and agriculture, as with the preceding sub-section, are discussed later.

3. Surface Water Quality - The surface water quality of the surrounding area is characterized by Class AA (coastal) waters of Kaneohe Bay adjacent to the makai portion of the project and the Class 2 (fresh) waters of North Waihee Stream. The State of Hawaii, Department of Health Water Quality Standards (Public Health Regulations, Chapter 37-A) classify waters in accordance with the uses which are to be protected. The uses to be protected by Class AA and Class 2 waters are as follows:

"Class AA waters:

The uses to be protected in this class of waters are oceanographic research, the support and propagation of shellfish and other marine life, conservation of coral reefs and wilderness areas, compatible recreation, and aesthetic enjoyment.

It is the objective of this class of waters that they remain in as nearly their natural, pristine state as possible with an absolute minimum of pollution from any source. To the extent possible, the wilderness character of such areas shall be protected. No zones of mixing will be permitted in these waters.

The classification of any water area as Class AA shall not preclude other uses of such waters compatible with these objectives and in conformance with the standards applicable to them."

"Class 2 waters:

The uses to be protected in this class of waters are bathing, swimming, the support and propagation of aquatic life, compatible recreation, and agricultural and industrial water supply.

It is the objective for this class of waters that their use for recreational purposes, propagation of fish and other aquatic

life, and agricultural and industrial water supply not be limited in any way. Such waters shall be kept clean of trash, solid materials or oils, and shall not act as receiving waters for any effluent which has not received the best degree of treatment or control practicable under existing technology and compatible with the standards established for this class."

Based on the preceding protected uses of Class AA waters, any use of the site will have an adverse impact on all of the protected Class AA uses based on the fact that all runoff from the site will ultimately enter Kaneohe Bay. The proposed project, however, will have little impact on Class 2 waters since none of the protected uses are sustained, with the possible exception of the support and propagation of aquatic life. The impact on support and propagation of aquatic life is considered negligible since the site contains no suitable habitat for waterbirds, native snails and fishes, nor are there any native amphibians on the project site or within the general area.

The impact of the proposed urbanization on the Class AA waters of Kaneohe Bay will be realized by:

a. Replacing the filtering capability of the existing vegetation (predominately California grass and mangrove) with fill material and urbanization that will reduce the existing filtering capability. The impact is generally considered to be a larger sediment and nutrient load to Kaneohe Bay. Appendix D (Environmental Aspects of Storm Water Runoff) analyzes the increase in the sediment and nutrient loadings resulting from the proposed development. This appended study discusses nutrients in the form of nitrogen and phosphorus, total sediment loadings as well as biocides and heavy metals.

b. Increasing the amount of stormwater runoff since the proposed fill and grading and ultimate development will partially create impervious surfaces that cannot absorb water as well as create surfaces which will transport water faster and thus reduce the potential time for soil absorption. The Preliminary Drainage Study (Appendix B) states that the surface runoff from the project site may increase from 99 cfs under existing conditions to 167 cfs under the developed conditions. This increase of 68 cfs represents 2.0 percent of the peak design discharge from North Waihee Stream into Kaneohe Bay.

c. Increasing the velocity of stormwater discharge to Kaneohe Bay and thereby increasing the ability of stormwater to transport sediment. The Preliminary Drainage Study states that the velocity of stormwater passing over the site is less than 2.0+ feet per second (fps) under existing conditions mauka of Kamehameha Highway and approximately 11.0 feet fps makai of the highway. Filling the site and creating a channel along North Waihee Stream will increase the stormwater velocity to approximately 7.0 fps mauka of Kamehameha Highway and 14.0 fps makai of the highway.

4. Groundwater Quality - The existing site is a marsh sustained by the median flow of North Waihee Stream. Since the North Waihee Stream flow consists of groundwater that has seeped from dikes, it is apparent that the area has no value for groundwater recharge. The proximity of Kaneohe Bay and salt water intrusion also eliminates the site as a potential source of groundwater. Therefore, the project should have negligible impact on groundwater. Furthermore, the site is not within the Board of Water Supply's no-pass zone.

The proposed project will, however, require an adequate water supply which will consist of groundwater. As previously documented, the preliminary estimate of the project's domestic (industrial plus residential) needs is 100,000 gallons per day (gpd). Therefore, the impact of the project on groundwater will be a depletion of the total amount of groundwater available on Oahu. It is believed that the impact of the proposed project on the ultimate groundwater supply will not be significantly adverse since it is generally known that Windward Oahu has additional source development potential that will sustain a majority of growth on both Windward and Leeward Oahu. However, if it is determined that adequate water is not available, this impact will be significantly adverse to curtail and foreclose the proposed project. The determination of availability will be made by the Board of Water Supply after construction plans are submitted for their review and approval.

5. Air Quality - The Air Quality Study for the proposed Kahaluu Commercial and Residential Development (Market City, Ltd.) as prepared

by Mr. Barry R. Root and contained in the Environmental Impact Statement for the Kahaluu Commercial and Residential Development has been included in this EIS to address air quality for the Kahaluu Industrial project (see Appendix E). After a thorough examination, it is believed the information contained within the Kahaluu Commercial and Residential Development (Market City, Ltd.) EIS is pertinent and has logical relevancy to the Kahaluu Industrial Project.

This determination has been based on the facts that:

1. The Kahaluu Commercial and Residential Development (Market City, Ltd.) and the Kahaluu Industrial project are comparatively similar in location, size and proximity to Kamehameha Highway. Both projects also require access to Kamehameha Highway.
2. Both projects have comparatively similar existing conditions, i.e., neither are developed and both are only subjected to low level natural pollutants (sea spray and acro-allergens) as well as man-made pollutants attributable to auto emissions of vehicular traffic on Kamehameha Highway and Waihee Road.
3. The Kahaluu Commercial and Residential Development (Market City, Ltd.) assessed air quality for projected peak hour volumes on Kamehameha Highway and a projected 520 concurrent peak hour vehicles resulting from their project site. The proposed Kahaluu Industrial project (including the residential portion) has utilized the same Kamehameha Highway peak hour volumes; however, the concurrent peak hour traffic for the latter project is 220 vehicles per hour. Therefore, it is not foreseen that the air quality determination for the proposed Kahaluu Industrial project could exceed that projected for the neighboring project.

As a result of the foregoing factors, the conclusions posed in the Kahaluu Commercial and Residential Development EIS seem more than appropriate for the Kahaluu Industrial project. These are:

1. Present air quality in the project area is estimated to be very good since there are no major contributing sources other than vehicles traveling on roadways along this part of the windward Oahu coast.

2. Except for short-term dust emissions during the construction phase of the project, no significant direct air quality impacts are expected.

3. Indirect air quality impacts are likely to result from demands for electrical energy. The most likely impact will be in the area of the Kahe Power Plant in the Waianae area where slight increases in particulates and sulfur oxide emissions can be expected.

4. Increased traffic generated by the project will increase carbon monoxide, hydrocarbons and nitrogen dioxide in the project area and along Kamehameha Highway. Except during periods of severe traffic congestion, however, predicted levels of these pollutants are expected to be within allowable State and Federal Ambient Air Quality Standards.

5. Adequate mitigative measures are available to control emissions of fugitive dust from construction activities, but no special mitigative measures seem necessary to ensure that air quality standards will be met.

There is no foreseeable method to predict the exact types of structures which will ultimately occupy the industrial subdivision lots. Subsequently, it is difficult to quantitatively project levels of air emissions and the effect on air quality. However, a review of the "permitted uses" within industrial (I-1) subdivisions, as delineated in Table 1, does not indicate that any of the permitted uses would generate a significant amount of air emissions. Most industrial facilities which generate large volumes of air emissions are limited to Heavy Industrial (I-2) districts.

6. Noise - Under the existing conditions, the Kahaluu area is considered a quiet neighborhood. Specifically, noise levels exceed 54.0 decibels only 10 percent of the time. For comparison, one of the noisier neighborhoods on the island is in the vicinity of Ward Avenue to Punchbowl Street where the noise level exceeds 57.0 decibels 90 percent of the time (Source: The State of Hawaii Data Book 1980; A Statistical Abstraction).

The proposed project will increase the ambient noise level. However, the increase will generally be greatest during the working day since the industrial subdivision will achieve peak activity during normal working hours. Irregardless of the type of activity on the project site, the Comprehensive Zoning Code establishes maximum noise levels (decibels) for various octave bands (cycles per second). In the cases when industrial districts are adjacent to residential districts, there are more stringent controls on the maximum permitted decibel levels. In addition, Public Health Regulations, Chapters 44-A and 44-B further establish noise standards for vehicular and community noise. It is not anticipated that the proposed project's noise will be adverse or exceed the foregoing standards.

The proposed light industrial/residential/agricultural project will be constructed adjacent to existing residential development, the Kahaluu Beach Park, utility base yards undeveloped land and numerous small commercial facilities. With respect to noise, the greatest impact will be felt on existing residences and Kahaluu Beach Park. However, the impact, as previously stated, is not anticipated to be significantly adverse since the noise levels generating from the project are legally limited. In addition to noise level reduction requirements, the Kahaluu Industrial Development will develop a detailed landscape plan for the Special Management Area permit (SMP) proceedings. It is proposed to utilize landscaping in excess of CZC requirements for the purpose of enhancing viewplanes. This landscaping will also act as a noise buffer.

Twenty-one permitted uses are presented within Table 1 of this EIS. Of the 21 uses, there are only three classifications which seem to have particular concern with respect to noise. These classifications are automotive repair; manufacturing, processing, extracting and fabricating; and printing. These types of facilities, if ever implemented, are subject to all existing CZC noise regulations and State of Hawaii Noise Regulations. However, restrictive covenants or deed restrictions can clearly emphasize the existing legal requirements and could require perspective tenants or owners to establish noise levels prior to lot development. The need for this type of restriction may be redundant since this restriction currently exists as a matter of law. No attempt has been made to establish noise levels from various permitted uses.

Temporary noise levels associated with construction, and in particular moving equipment, will cause increased noise levels. Construction noise levels are controlled by State and OSHA standards.

7. Climate - The climatic conditions of the Kahaluu area indicate a temperature range varying between 72.9 and 79.1 degrees for the coolest and warmest months, respectively. The extreme temperatures range from 58 to 90 degrees. Average annual precipitation is approximately 60 inches of rain. (Source: State of Hawaii Data Book, 1980; A Statistical Abstract).

The proposed project will not affect existing climatic conditions.

#### B. BIOLOGICAL CHARACTERISTICS

1. Flora - The vegetation which currently occupies the project site is typical of that found on much of Windward Oahu on land of comparable rainfall, elevation, exposure to human activity and drainage patterns. Indigenous plant populations have been subjected to many forces, including: agricultural practices and plant introductions of pre-contact Hawaiians, grazing pressures, successful competition by intentionally and accidentally introduced species, clearing and grading activities, and fires. As a result, native plants make up a much-reduced fraction of the total plant community. This was shown in the botanical survey of the site, conducted to verify the existence or absence of native Hawaiian plants (Appendix F). It was found that the flora of the site, except for a single plant of Psilotum nudum (Moa) is made up entirely of introduced plants.

Presently, the makai section contains a dense stand of Rhizophora mangle L., American Mangrove and Hibiscus tiliaceus (Hau) and Leucaena leucocephala (Haole Koa). The cover on the mauka section is mostly comprised of: Brachiaria mutica (Forsk.) Staph., California Grass; Ludwigia octovalvis (Jacq.) Raven; Typa angustata Borg & Caubord; and the Great Bulrush Scirpus californicus (C.A. Meyer). There is little value of the site as an example of native plant habitat. The chief values of the current flora are soil retention and general vegetative

cover as a habitat for introduced amphibians, reptiles and mammals. The "Species List" of the Botanical Survey (Appendix F) contains those species actually sighted.

Initially, the proposed action will involve clearing, grubbing and filling activities which will result in the removal of most of the vegetative cover cited in the "Species List" (Appendix F - Botanical Survey). In general, because of the highly modified character of the project site and because none of the biota are considered to be endangered, the impact of removal will not be significant. The related impact on the flora's ability to act as a filter and retain sediments has been previously discussed in Section IV.A.3 - Surface Water Quality.

The proposed project will create lots only. As a temporary erosion control measure, the lots will be grassed. After completion of the subdivision, lessees or owners will develop plot plans with landscaping in accordance with the Comprehensive Zoning Code (CZC). The relevant CZC landscaping requirements call for landscaping to minimize potential adverse influences on property in the same or neighboring zoning districts. The net result should be one of replacing mostly exotic flora typical of saturated soil conditions with other exotic vegetation.

2. Fauna - A fauna report of the project site was conducted to verify the existence or absence of any endangered species (see Appendix G - Fauna Report). In summary, it was determined that there is no suitable habitat on the site for native snails or fishes. No native amphibians, reptiles, or mammals were found in the area. Neither the mauka or makai sections of the project site provide suitable habitat for endemic or native birds or permanent habitat even for introduced bird species. The fauna report (Appendix G) includes a list and brief description of habitat of those species actually sighted or presumed to inhabit the project site.

As the site contains only non-native fauna, the proposed project will pose no impact on endangered species. No structures are proposed to be built in the waters of Kaneohe Bay or within the Shoreline Setback Area, with the possible exception of drainage improvements to the North Waihee Stream channel.



C. CULTURAL FACTORS

1. Land Use - The project site is located in an area where many changes in land use have occurred. Once the area supported intense taro production; however, most taro-producing sites on Windward Oahu were converted to rice production sometime between 1870 and 1900. Later, some parcels produced sugarcane and pineapple. Eventually, many growers found their crops could not successfully compete at the market place with similar crops grown elsewhere. After large-scale growing of pineapple, there was a return to small-scale rice and taro cultivation. By the 1930's, many acres were used for cattle grazing or fell to disuse. In more recent years, increased demands for housing by a growing Honolulu-Pearl Harbor-Kaneohe Marine Corps Air Station employed population has stimulated the expansion in new housing developments in Kaneohe, as well as in the areas of Ahuimanu and Kahaluu.

The implementation of the proposed action may result in increasing the values of properties surrounding the project site. Increased property values may result in eliminating the option of agricultural use on these properties.

Specific land uses in the surrounding area include: two service stations, a drive-in restaurant, bank, truck storage bus yard, shops; and directly adjacent to the site: Hawaiian Telephone transfer station, Board of Water Supply pumping station, and Hawaiian Electric booster station, residential housing, a church and small truck farming operations. The changes in land use in the vicinity of the project site reflect the changes that have occurred in the greater Windward region. Figure 11 depicts the existing industrial/commercial land uses for the project area.

Presently, the project site is undeveloped. Within the property, there are three different zoning designations, i.e., I-1 Light Industrial, R-6 Residential and R-3 Residential Districts. The proposed action would intensify the land use of the site to that which is generally planned and zoned.

2. Archaeological and Historical Resources - To verify the existence or absence of any artifacts, an archaeological reconnaissance was

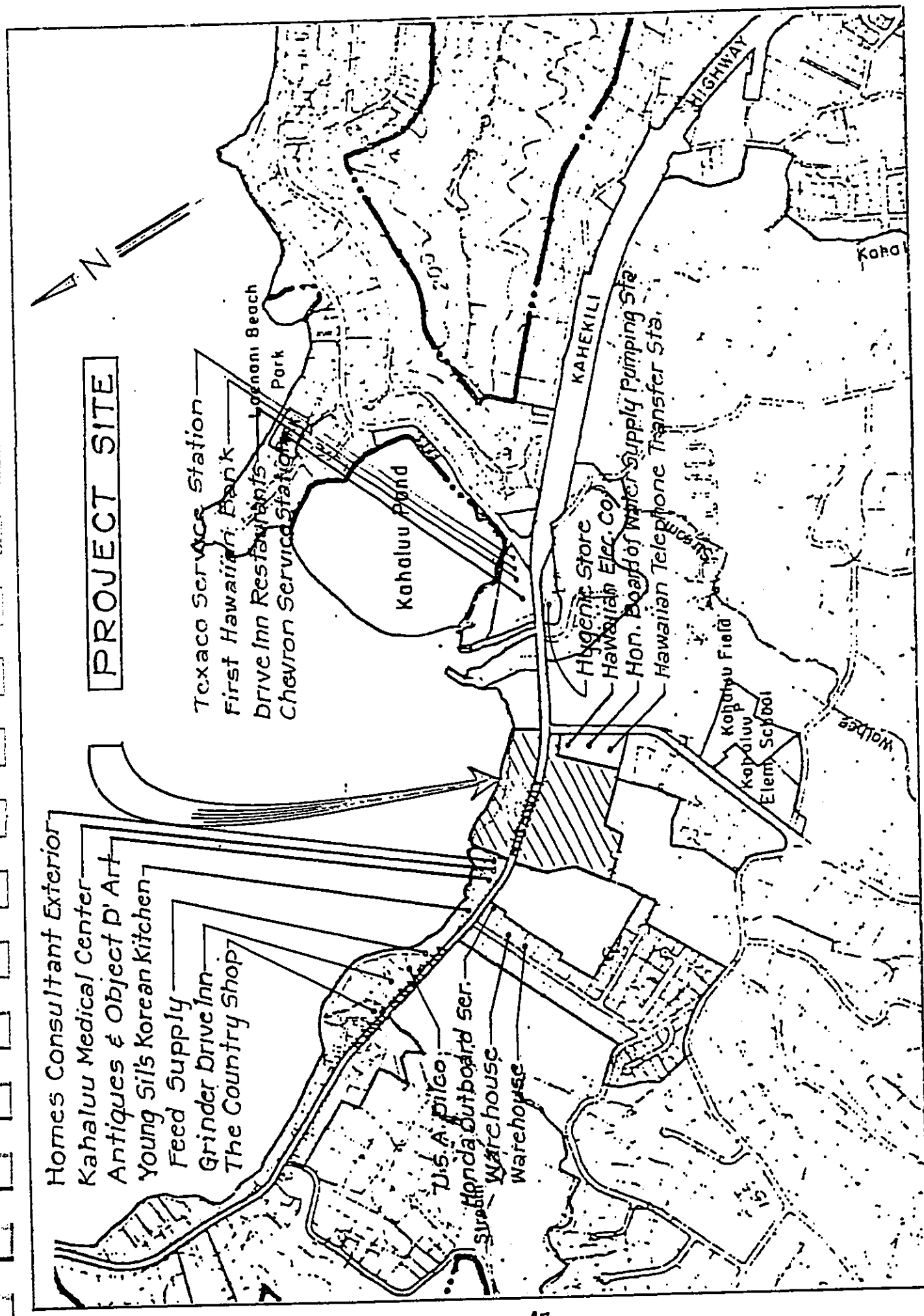


FIGURE 1E  
 EXISTING INDUSTRIAL COMMERCIAL  
 USES NEAR PROJECT AREA

conducted (see Appendix C). It was determined that there are no above-ground archaeological features nor any indication that significant features lie buried underneath the subject parcel. While the site is located in an area of once intense taro production, on-site survey and test probing did not yield any evidence that the taro lo'i or terrace walls survived the changes in land use to rice production and later grazing.

While no archaeological artifacts are known to exist on the site, it is possible that site grading activities in the early phases of construction may uncover previously undiscovered archaeological features. In that event, the contractor will contact the Division of State Parks, Historic Sites Section.

3. Aesthetics and Viewplanes - The physical features of Windward Oahu, as a whole, have high aesthetic value. The Koolaupoko region is characterized by steep cliffs and amphitheater-headed valleys that meet the shoreline at a relatively short distance. In the immediate vicinity of the project site is a two-lane highway with associated roadside businesses: two service stations, a drive-in restaurant, bank, general store and tourist-related retail outlets. The areas that border the southeastern and mauka boundaries are occupied by a Hawaiian Telephone transfer station, a Hawaiian Electric booster station, a Board of Water Supply pumping station, residential structures, small truck farms and a church. Therefore, the area surrounding the project has been previously urbanized.

The proposed development is located on low-lying land of mostly flat terrain except for the southwestern portion of the site. Two distinct, yet related, physical settings are exhibited within the boundaries of the project site. The mauka section is mostly overgrown with introduced grasses. The makai section is covered by hau and mangrove. As seen from Kamehameha Highway, the vegetation on the makai section create an effective visual barrier of Kaneohe Bay. The proposed clearing and grading activities will temporarily improve the aesthetic values and viewplanes of the project site. However, the eventual construction of structures on the mauka section will not improve aesthetic values and viewplanes. It has been noted that

from the perspective of Kahaluu Beach Park, the existing mangrove stand provides a barrier to views of traffic on Kamehameha Highway. The clearing of this vegetation and eventual development could conceivably detract from public enjoyment of existing viewplans from the beach park.

The Special Management Area Permit (SMP) process is particularly concerned with the visual aesthetics of the proposed project and viewplanes of Kaneohe Bay from Kamehameha Highway. A specific contextual requirement of the SMP application will be site plans, landscape plans and sections to detail the concern regarding viewplanes presented herein. Table 1 of the EIS presents 21 permitted uses within the industrial district. Certain permitted uses such as eating and drinking establishments; public buildings and grounds; certain types of offices; private clubs, lodges, social centers and athletic clubs may be considered more appropriate and visually acceptable.

The intent of the EIS is to represent there is consideration to satisfy viewplane requirements of the SMP to providing compatibly with the shoreline and adjacent land uses. It is anticipated that the Special Management Permit, if issued, can only be issued based on detailed plans which satisfy viewplane requirements of the Special Management Area. It may further be required that the project, and in particular the makai area, carry deed restrictions or lease restrictions to ensure that viewplanes are maintained. This determination will be provided by the Department of Land Utilization.

D. TRAFFIC

Kamehameha Highway is a two-lane two-way highway which is the only major arterial serving the project area (see Figures 12 & 13 and Table 5). Approximately 2000 feet south of the project area, Kamehameha Highway merges with Kahekili Highway.

As reported in the Kahaluu Commercial and Residential Development EIS (see Appendix H), the past, present and projected average daily and peak hour traffic for Kamehameha Highway at Waihee Road is:

TABLE 4

<u>Year</u>	<u>Average Daily Traffic</u>	<u>Peak Hour Volumes</u>
2000	35,548*	2,855*
	24,191**	1,991*
1990	25,821*	2,074*
	18,100**	1,446**
1981	27,067*	1,378*
	11,965**	961
1980	--	--
1979	15,123	--
1978	14,205	1,134
1977	--	--
1976	12,204	--
1975	--	--

\* projected

\*\* probable average volume

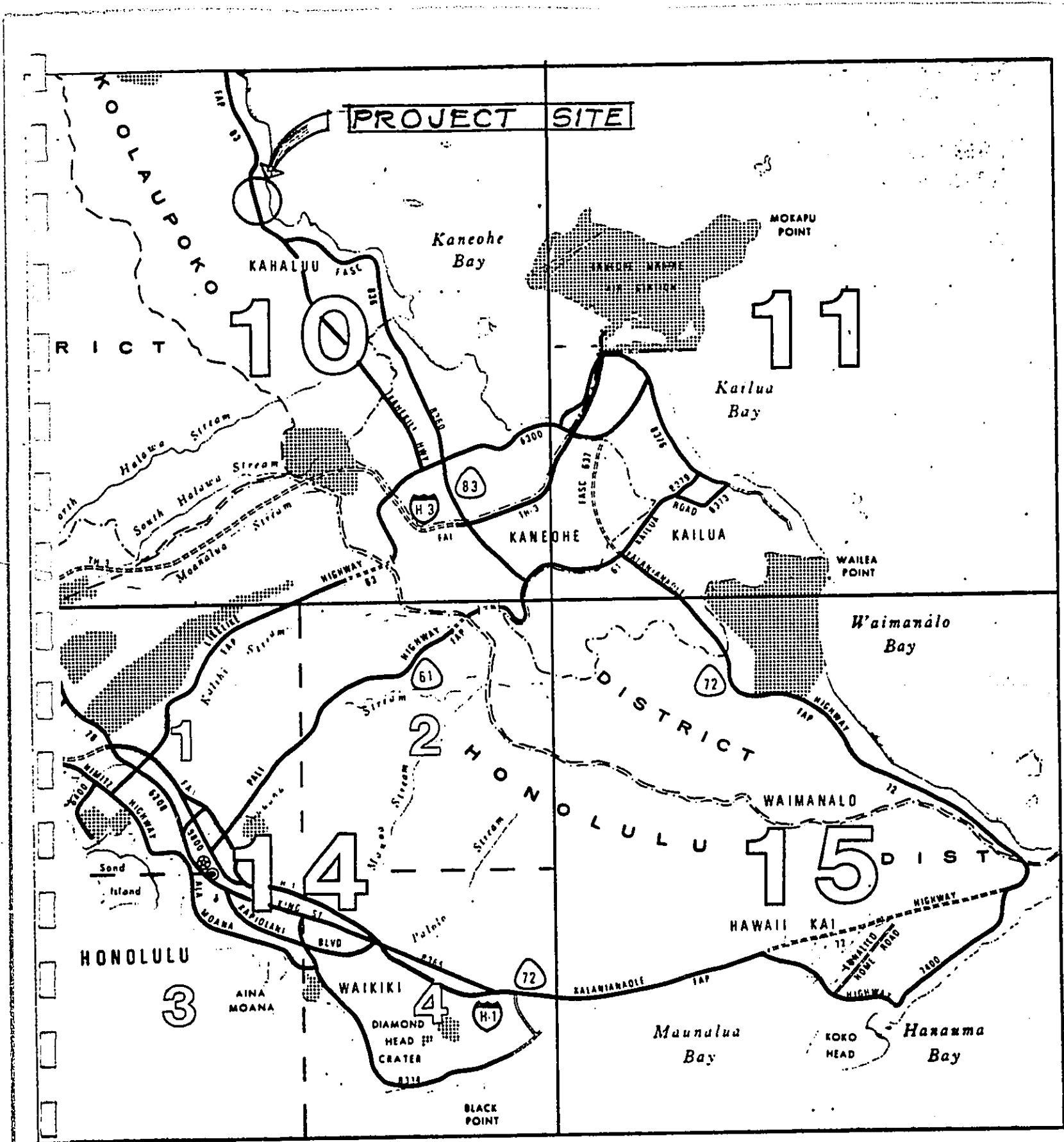
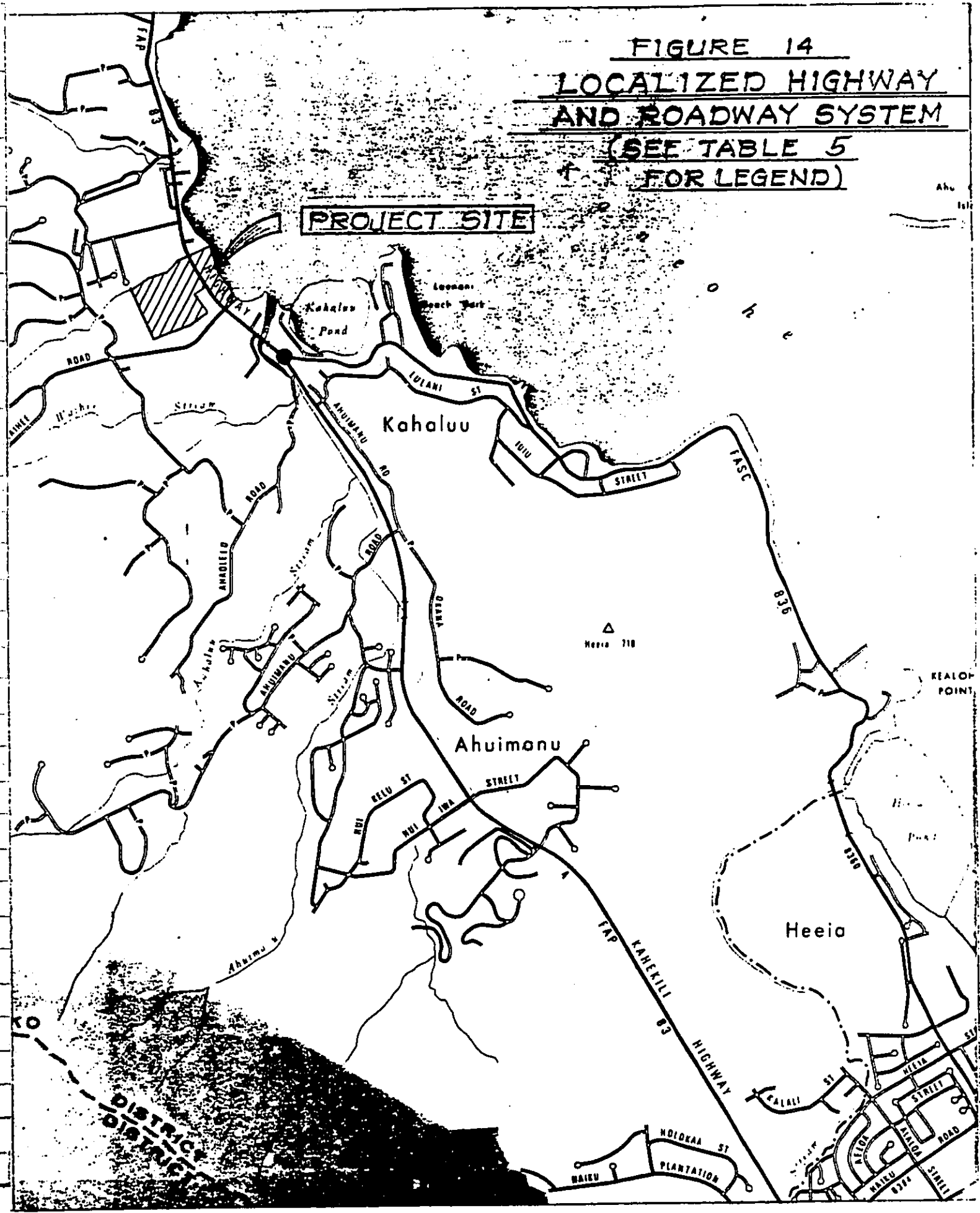


FIGURE 13  
REGION HIGHWAY SYSTEM  
 (SEE TABLE 5 FOR LEGEND)

**FIGURE 14**  
**LOCALIZED HIGHWAY**  
**AND ROADWAY SYSTEM**  
**(SEE TABLE 5**  
**FOR LEGEND)**



FAI	FEDERAL-AID INTERSTATE
FAP	FEDERAL-AID PRIMARY HIGHWAY SYSTEM
FAS	FEDERAL-AID SECONDARY HIGHWAY SYSTEM
FASC	FEDERAL-AID SECONDARY COUNTY HIGHWAY SYSTEM
	FEDERAL-AID HIGHWAY SYSTEM
	PROPOSED ROAD
	PRIVATE ROAD
	PRIMITIVE ROAD
	GRADED AND DRAINED ROAD
	INTERSTATE ROUTE SIGN
	ROUTE SIGN
	DIVIDED HIGHWAY
	HIGHWAY OVERPASS
	HIGHWAY UNDERPASS
	HIGHWAY BRIDGE
	HIGHWAY TUNNEL
	FLUME
	STREAM
	INTERMITTENT STREAM
	IRRIGATION DITCH
	DISTRICT BOUNDARY
	MILITARY BOUNDARY
	FOREST RESERVE BOUNDARY
	MILEAGE BETWEEN POINTS
	TRIANGULATION STATION
	STATE CAPITAL
	COUNTY SEAT
	AIRPORT COMPLETE FACILITIES
	AIRPORT LIMITED FACILITIES
8376	FEDERAL-AID URBAN HIGHWAY SYSTEM
	URBAN BOUNDARY

TABLE 5  
HIGHWAY SYSTEM  
LEGEND  
(SEE FIGURES 12 & 13)



Since the reported peak-hour capacity of Kam Highway under its present two-way lane highway configuration will have a capacity ranging from 1,605 to 1,871 vehicles per hour, the capacity is considered adequate through the year 1990. After 1990, Kamehameha Highway must be improved to a four-lane divided highway. The four-lane divided highway will have a peak-hour capacity ranging from 2,892 to 4,958 vehicles per hour.

As detailed in the Traffic Impact Statement of the Kahaluu Commercial and Residential Development (Market City, Ltd.) EIS, the traffic projections are based on continual traffic growth within Windward Oahu at an annual rate of approximately 8%. The growth is directly attributable to development and it has been assumed that growth will continue at this rate through the Year 2000. The traffic projections therefore include traffic generated from the Kahaluu Industrial Development and any other development within Windward Oahu utilizing this portion of Kamehameha Highway. In other words, the specific traffic generation depicted in Table 4 include development of the proposed Kahaluu Industrial project.

The foregoing paragraphs basically describe the analysis of Kamehameha Highway as presented in the Kahaluu Commercial and Residential (Market City, Ltd.) Final Environmental Impact Statement.

The State Department of Transportation (DOT), however, did not concur that the existing Kamehameha Highway will have adequate capacity to accommodate present and future demands through the Year 1990. Further, DOT's opinion was that the Kahaluu Residential and Commercial Development (Market City, Ltd.) would create an adverse traffic impact. And finally, there are no plans to improve Kamehameha Highway to a four-lane facility.

The proposed Kahaluu Industrial project will create twenty-one (21) industrial subdivision lots (I-1), two (2) residential subdivision lots (R-6) and one (1) residential subdivision lot (R-3). The R-6 residential portion of the project could be developed to create a maximum of 34 lots and the R-3 residential portion of the project could be developed to create a maximum of 34 lots. While development of residential lots is dependent on the method of sewage disposal, this traffic analysis will assume that development will occur to ensure that future options have been addressed. Kamehameha Highway has a 35-foot setback for future widening. All proposed lots will observe this setback requirement.

It is proposed to construct 56-foot wide roadway to provide access to the proposed industrial subdivision mauka of Kamehameha Highway. Access

to the proposed lots makai of Kamehameha Highway will be via Kamehameha Highway. Figure 4 details the proposed subdivision layout and 56-foot wide access roadway. The proposed traffic generation for the project generation for the project is illustrated in Table 6 below:

TABLE 6

KAHALUU INDUSTRIAL PROJECT  
TRAFFIC GENERATION

Zoning	Area	Average Daily Traffic Trip Generation Factor	Average Daily Traffic	Peak-Hourly Traffic
I-1	13.0±	60 - 160 trips/acre	780 - 2080	156 - 172
R-3	8.0±	8 trips/lot*	272	24
R-6	4.0±	8 trips/lot*	272	24
			1384 - 2624	204 - 220

\* Refer to page T-24 Appendix H

The average daily trip generation has a range between 60 trips/acre/-day and 160 trips/acre/day. The trip generation factor suggested by the Institute of Transportation Engineers ("Traffic Generation," 2nd Ed., 1979) for industrial areas consisting of light industrial, manufacturing, industrial parks and warehouses, is 60 trips/acre. However, since the Comprehensive Zoning Code allows for commercial eating and drinking establishments within I-1 zoning districts, a more conservative value of 160 trips/acre has been utilized. This value is the average of all commercial shopping centers within the United States. It should be emphasized that it is not anticipated that the proposed project will approximate a commercial shopping center but rather the traffic generation factor for a commercial center will provide conservative maximum estimates for traffic analysis. The actual value realized should fall between the range anticipated.

The peak-hourly traffic for the industrial portion of the project has a range of 156 peak-hourly vehicles through 172 peak-hourly vehicles. As with the average daily trip generation factor, the low side of the range is attributable to light industrial development and the high side is attributable to a semi-commercial development. The peak-hour factor for a light industrial application is 20% of the average daily traffic as reported by the Northwestern Traffic Institute. The peak-hour factor for a semi-commercial application represents the amount of traffic which could be expected during the morning or after-noon peak hour. A value of 8.3%

has been utilized based on the Traffic Impact Statement of the neighboring project, Kahaluu Commercial and Residential Development (see Appendix H, page T-24, Table 16).

The average daily traffic for the residential portion of the project is based on eight (8) trips/residence (lot) and the peak-hourly traffic is based on 8.8% of the average daily traffic. These values have often been utilized and are assumed to be typical values for Oahu.

Based on the State Department of Transportation comments to the Kahaluu Commercial and Residential Final EIS, it appears more prudent to examine how the proposed Industrial Subdivision will affect future traffic on Kamehameha Highway with respect to Department of Transportation concerns. The following items therefore represent premises which are believed to be generally true for the proposed project.

1. The employees of the proposed industrial subdivision will consist of employees who previously held jobs elsewhere as well as employees who have never been a part of the working force. Therefore, a portion of the peak-hourly trips (see Table 6 - Traffic Generation) generated by the project are already regular commuters and the actual increase in peak-hour trips on Kamehameha Highway will be less than 156-168 trips.
2. The project's location is such that peak-hourly traffic resulting from the project will be in the opposite direction of the peak-hourly traffic headed toward the business districts of Kaneohe, Kailua and Honolulu. As a result, the project should not appreciably aggravate and possibly slightly alleviate congested areas such as at the intersection of Kahekili Highway and Likelike Highway.
3. As congestion increases on a roadway system, the typical peak-hour commuter will resort to other alternatives to avoid congestion. These alternatives are:
  - a. Leave home/office earlier
  - b. Leave home/office later
  - c. Carpool
  - d. Utilize mass transportation
  - e. Locate alternate route

Normally, a roadway system realizes its peak capacity when the traffic counts for peak-hour intervals remain constant with time while the average daily traffic continues to increase. The roadway system therefore always has the ability to handle more capacity by increasing the "peak-hour" interval to a period longer than one hour.

An example of such a roadway system is Kalaniana'ole Highway between Hawaii-Kai and Honolulu. This roadway has had a relatively constant peak-hour capacity since the early 1970's. However, the average daily traffic continues to grow because commuters have chosen to stretch out the peak-hour.

4. Highway improvements are usually not implemented in anticipation of a highway reaching its peak capacity. Highway improvements are usually implemented after a highway has reached its peak capacity, and the peak-hour interval has stretched to a period where the general public mandates an improvement.

If the foregoing premises are generally conceived to be accurate or reasonable, the most significant impact of the proposed Kahaluu Industrial Subdivision will result in increased traffic congestion at the proposed intersection at Kamehameha Highway and during the A.M. and P.M. peak-hour intervals.

Other related impacts such as increased congestion at neighboring streets will be reduced substantially compared to the proposed intersection since numerous collector streets connect to Kamehameha Highway to the North and Kahekili Highway to the East. The numerous collector streets imply that morning traffic headed to the proposed project will concentrate at the project entrance while afternoon traffic will disperse as the traveling distance increases from the project. There are approximately 16 roadways connecting to Kamehameha and Kahekili Highways between Waihole Valley Road and Valley of the Temples Shopping Center.

E. Public Utilities and Services:

1. Water - There is an existing 30-inch transmission main in Kamehameha Highway as well as a 12-inch transmission main in Waihee Road. The proposed project will require a connection to the existing

water transmission system which is maintained by the Board of Water Supply. The most significant impact of the proposed project is that on the depletion of groundwater through source development to solve the project's 100,000+ gpd domestic need. This impact has been discussed within Section IV.A.4 - Groundwater.

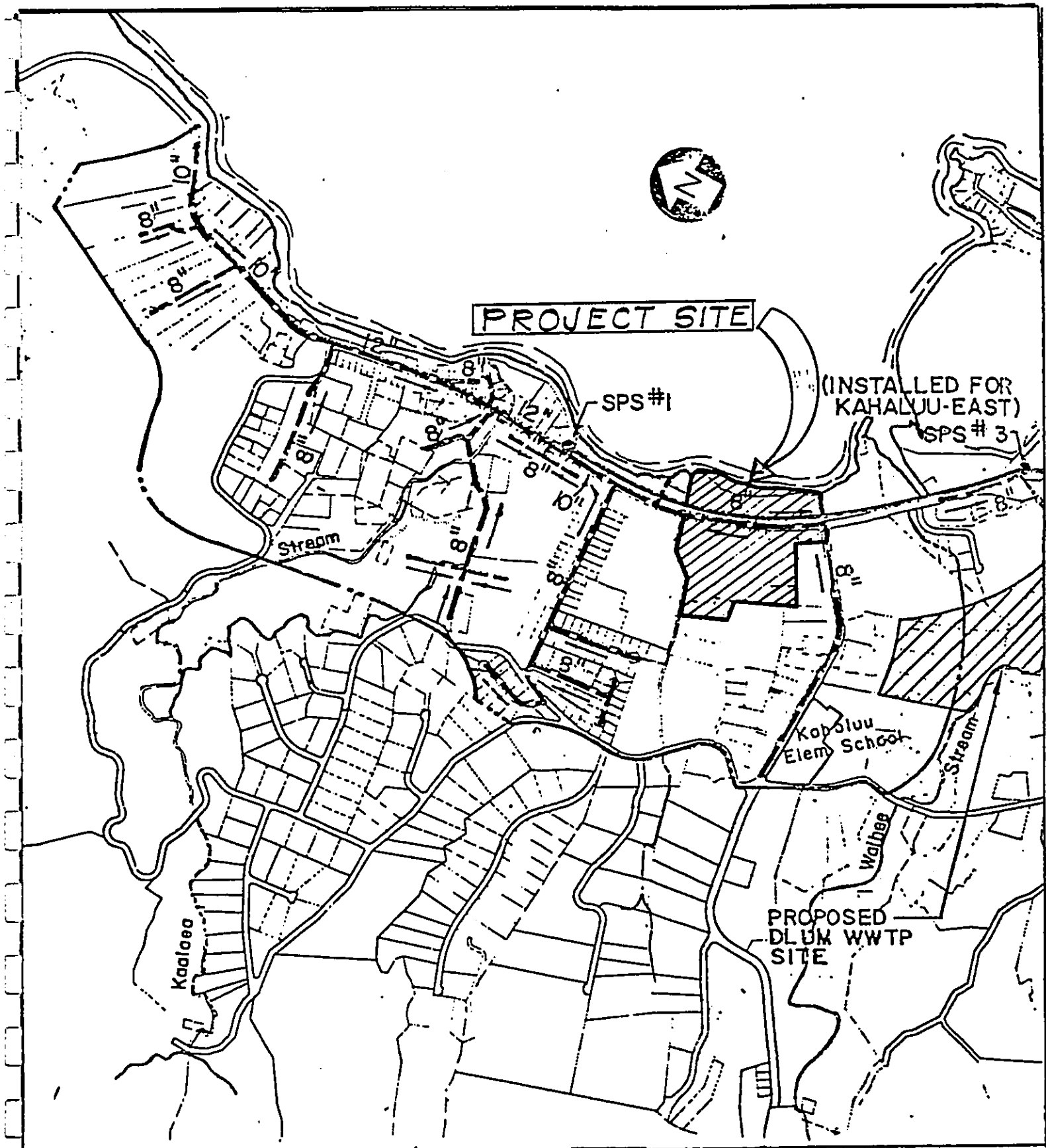
There is no significant impact anticipated on the existing transmission system. However, installation of new main and connections to existing mains will have temporary construction related impacts. These impacts may cause temporary traffic congestion if work is required within existing roadway areas and temporary loss of service to sewer connections to existing mains.

2. Sewage Treatment and Disposal - The Kahaluu area under existing conditions is unsewered and the typical method of sewage treatment and disposal is by means of individual disposal systems, i.e., cesspools, septic tanks, aerobic units and seepage pits.

The Kahaluu Wastewater Treatment and Disposal System will eventually provide sewers for the area. Figure 14 illustrates the master-planned sewers for the project site as well as the Kahaluu-North Sub Area. The Kahaluu Industrial Project will ultimately connect to this system; however, sewage treatment and disposal will be required prior to implementation of master-planned sewers.

There are two (2) options for sewage treatment and disposal for the project and each alternative has different impacts. The alternatives and impacts are as follows:

Alternative No. 1 - Collect and transport all sewage to the Ahuimanu Sewage Treatment Works via the proposed Kahaluu Sewage Pump Station. The proposed Kahaluu Residential and Commercial Project (Market City, Ltd.) directly adjacent to the Kahaluu Industrial Project also proposes this method of sewage treatment and therefore, it is possible that both projects could utilize the same force main. This alternative must be reviewed and approved by the City and County of Honolulu, Department of Public Works.



SCALE IN FEET

- FORCE MAIN (PROPOSED)
- - - GRAVITY LINE (PROPOSED)
- · · · · TRIBUTARY AREA
- SEWAGE PUMPING STATION (PROPOSED)

FIGURE 15  
MASTER PLANNED  
SEWERS AT KAHALUU

The resultant impact of this alternative is the potential spillage of sewage at the location of pump stations during power outages. However, pump stations require stand-by power and this impact is not considered likely. In addition, the installation of force main will have temporary construction-related impacts and possibly generate traffic congestion in and near roadway areas.

Alternative No. 2 - Collect and treat all sewage on-site with ultimate reuse of treated sewage effluent as irrigation water for agriculture. The area which would be utilized for agriculture is the 8.0+ area residentially (R-3) zoned portion of the project site. As with Alternative No. 1, an on-site collector system and private pump station would be required to deliver sewage to the treatment works. However, the treatment works would be located on-site.

Additional facilities which would be necessary to implement the effluent irrigation system are a 10+-day capacity holding tank for retention of effluent during rainfall periods and an irrigation network.

Since effluent is proposed for reuse as irrigation water, there is a potential impact of pathogens within the irrigation water infecting personnel who may come in contact with the irrigation water. There is also a potential for runoff from irrigated areas to enter Kaneohe Bay. However, to maintain the irrigation system, the treated sewage effluent must be chlorinated as well as filtered through a sand filter. In addition, a holding tank (250,000 to 500,000 gallon capacity) will be installed to eliminate irrigation during days of heavy rainfall. Chlorination and sand filtration should effectively reduce the fecal coliform count in the treated effluent to less than 2.2 colonies/100 ml, a normally recognized treatment standard for effluent reused for irrigation purposes.

The impacts of effluent irrigation are not considered significant when properly employed. The State of Hawaii Department of Health will review and approve the use of all on-site sewage treatment plant and effluent irrigation system.

There are numerous examples of major effluent irrigation applications in which the potential impacts of disease transmission and water quality degradation are not evidenced. These examples involve effluent irrigation on the Kaneohe Marine Corp Air Station Golf Course, Kuilima Golf Course and Keahou Golf Course as well as effluent irrigation of sugarcane lands by treated effluent from the Wahiawa Sewage Treatment Plant and Makakilo Sewage Treatment Facilities.

3. Telephone and Electrical Services - Telephone and electrical lines are located overhead Kamehameha Highway and Waihee Road. There is existing telephone and electrical service in the area such that service can readily be extended. The telephone and electrical lines serving the project will be connected with the main overhead lines on Waihee Road. All electric and telephone systems for the proposed project will be underground.

Eventual lessees and/or occupants of the proposed project will require electricity for their day-to-day activities. As petroleum is the basic resource used in the production of electricity, and all of it is imported, increasing demands for electricity only perpetuates the State's dependence on outside source for petroleum. Increasing the production of electricity either results in the burning of expensive low-sulfur fuel (with resulting negative economic impacts) or cheaper high-sulfur fuel (with negative impacts on air quality).

4. Solid Waste - Solid waste generated by single-family homes in the area are usually collected by the Refuse Division, Department of Public Works, City and County of Honolulu and disposed at Kapaa Sanitary Landfill. The proposed change in land use of the site will result in an increase in the amount of solid waste generated by the greater Windward Oahu region. It is impossible to determine the amount of solid waste that will be generated by the proposed industrial subdivision because the Comprehensive Zoning Code allows for a wide variety uses on I-1 zoned land. The solid waste generated by the proposed light industrial subdivision will be collected by a private refuse collection company and disposed at Kapaa Sanitary



Landfill. While the solid waste generated by the proposed industrial subdivision will have no impact on City collection services, the impacts will be felt elsewhere, namely, Kapaa Sanitary Landfill.

5. Police and Fire Services - The Kaneohe Police Substation is located approximately 5 miles from the project site. The Kahaluu Fire Station is less than a mile away from the proposed project. The Kaneohe and Kaaawa fire stations will provide supportive fire service.

The proposed project will increase the extent of patrols and time involved in investigating calls. The Police Department, in their consultation in the preparation of this EIS, did not express any obvious concern on this subject. In their written consultation comments on the proposed project, the Fire Department indicated that they had no objections to the proposed project.

6. Schools - The existing schools serving the project area are Kahaluu Elementary School, King Intermediate School and Castle High School. The proposed light industrial subdivision will not increase the enrollment of the schools serving the project area.

In their written comments received during the public review period, the State of Hawaii, Department of Education has determined that in the event the alternative residential development occurs, enrollment growth can be accommodated with existing and planned school facilities.

7. Recreation - Kahaluu Beach Park (City and County of Honolulu) is located directly adjacent to the makai section of the project site. The park is used for fishing, netting and crabbing. Kahaluu Flood Control lagoon provides opportunity for boating and fishing activities. Kahaluu Park and Community Center is located several hundred feet mauka of the project site on Waihee Road.

Considering the extent of recreational facilities available in the project area, the impact of the proposed mixed use of the site should be minimal. The Department of Parks and Recreation, City and County of Honolulu, has expressed the opinion that the makai section should be left as open space and as an extension of Kahaluu Beach Park. It is intended that these lands be developed to support the

permitted uses as defined by the City and County of Honolulu Comprehensive Zoning Code. The proposed action will commit the site to its intended use. Realistically, the high value of the property, as zoned, eliminates the use of the land for recreational activity. It is believed that additional lands for the purpose of extending Kahaluu Beach Park should be acquired by other methods, i.e., condemnation.

The proposed project will comply with the City's Shoreline Access Ordinance No. 4311 and the City's Park Dedication Ordinance No. 4621 as applicable.

8. Mass Transit - The project site is served by one bus route, Route 52 (Honolulu-Wahiawa-Kaneohe) and runs along Kamehameha Highway in the vicinity of the proposed project.

As stated in the Kahaluu Commercial and Residential (Market City, Ltd.) Revised EIS, there is a 30-minute headway for bus service. The combination of infrequent bus service and the bus route makes mass transit use very inconvenient for patrons and employees of the proposed light industrial subdivision. Patrons will most likely transport items from industrial facilities which are too cumbersome for mass transportation. Further, light industrial facilities normally have an abundance of parking space for employees and patrons. In the event that residential use is proposed, based on 4.1 persons per house, a bus use factor of 25% and a total of 68 potential houselots, the residential portion of the project could generate 70 mass transit users.

F. SOCIO-ECONOMICS

The social ramifications of the proposed action are generally secondary in nature. Aside from the direct social implications on public services, indirect and secondary effects include changes in lifestyle and land use.

At present, there is no one residing on the project site. According to the 1980 edition of the State of Hawaii Data Book, the resident population of Kahaluu in 1970 was 1,657 or 0.26 percent of the Oahu 1970 population of 630,528 and in 1980 the population was 2,919 or 0.38 percent of the

total Oahu population of 760,926 for the same year. Unless residential use is implemented on the residential-zoned portions of the site, the proposed project is not expected to alter the demographic data for the Kahaluu area.

It should be noted that the Kahaluu Neighborhood Board and Hui Malama Aina O'Koolau in their written consultation comments on the EIS Preparation Notice for the proposed project expressed many concerns regarding probable social impacts on the existing community. The Kahaluu Neighborhood Board has adopted Community Goals (enclosed in the Kahaluu Neighborhood Board consultation) which generally identifies the Windward area from Kualoa to Kahaluu as a buffer zone between rural areas and Honolulu. Relevant "Community Goals" for this discussion include: "that Kahalu'u (a) Remains a community devoted to diversified agricultural and related activities; . . . and (c) Maintains its essential rural lifestyle." As previously stated, the applicant proposes to create an agricultural lot or residential subdivision lots on the residential-zoned portions of the site depending on the method of sewage disposal ultimately allowed. However, agricultural use of the industrial-zoned portions of the site would represent an under-utilization of the property in terms of existing governmental policies (zoning) for the area.

The Windward area lifestyles from Kualoa to Kahaluu may be characterized as rural; however, it should be noted that the area in the immediate vicinity of the project site shows a mix of industrial, strip commercial (See Figure 11) and residential uses as could be expected with land uses surrounding a highway. Therefore, the proposed action is consistent with existing land uses in the immediate vicinity of the project site.

The development of the proposed project will change the topography and therefore make it more difficult for present residents and future generations to study the history of the region.

The project should have no significant impact on the level of physical illnesses, but there will be a slightly greater demand on health care facilities on the Windward area created by the proposed action. There will be a possibility of increased traffic accidents from additional traffic generated by the project.

Economic impact of the proposed action will be both short and long-term. Projected construction costs for the project have been estimated at 5.0+ million dollars, the majority of which can be expected to be spend on local labor, materials, equipment and supplies. Revenue will be generated for the government through taxation of the wages and materials used.

After its completion and occupation, the project will not change the overall regional pattern of employment, such as commuting to Kaneohe Marine Corps Air Station-Pearl Harbor-Honolulu. However, the project will offer the surrounding community employment opportunities in the businesses attracted to the light industrial subdivision. In addition, the proposed project will generate employment opportunities in agriculture or service-oriented trades for maintenance of residences, depending on which alternative use is implemented on the residential-zoned portions of the site.

The economic impact of the proposed action is expected to be positive, as there will be a substantial increase in income generated from the project site. Future sales, income and real property taxes are anticipated with the development.

V. ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The Kahaluu Industrial Project is anticipated to have the following unavoidable adverse environmental effects.

1. All construction activities will temporarily increase noise levels, air quality deterioration and surface water quality deterioration as well as increase traffic congestion when construction activities are occurring immediately adjacent to or within existing roadways.
2. There will be an adverse impact on the surface water quality of Kaneohe Bay.
3. The project's domestic water demand will represent a permanent demand on the Island's finite water supply.
4. Increased vehicular traffic will increase auto emissions to the atmosphere.
5. The ambient noise level will increase.
6. The aesthetics of "openness" will be replaced by urbanization. This adverse effect is subject to interpretation based on personal values and there is reason to believe that a portion of the population would not concur that this is adverse. However, for the purpose of this EIS, it has been considered an adverse effect.
7. The proposed project will increase traffic on Kamehameha Highway and neighboring collector streets.
8. The need for public utilities and services will increase.
9. The Kahaluu Neighborhood Board and Hui Malama Aina O'Koolau is opposed to the project (refer to Consultation Comments). The most significant issue is the implementation of industrial development on land which these organizations believe is suited for other planning options.

In light of the foregoing adverse environmental effects, the rationale for proceeding with the proposed project is as follows:

1. The owners/developers recognize the adverse environmental effects of the proposed project; however, it is believed that none of the effects are significantly adverse to discontinue the processing of all necessary documentation which is required for such a project.

It is further believed that the technical data contained herein does not clearly support any contention that the project is unfeasible from an environmental, technical or an economic perspective. If such a condition exists, there would be no need to proceed or continue with the project.

2. The owners/developers believe that there is a real economic demand for such facilities in the Windward area. The demand is based on the present lack of undeveloped industrial land in this area and a demand for services and facilities in this area.

Over the years, Alexander & Baldwin, Inc. has received several requests from various entities to obtain industrial sites at the proposed project site. A Market Study (Appendix I) reports that there is a demand for industrially zoned lots in this area that will be created by major projects under construction and/or proposed in this area.

VI. ALTERNATIVES TO THE PROPOSED ACTION

A. NO ACTION

No development would preclude most of the adverse environmental effects summarized in the preceding section. The no-action alternative would be to retain the site in its present vacant and undeveloped condition. The site, however, has been zoned for light industrial and residential use and this alternative would be an underutilization of the property in terms of existing governmental policies for the district. In addition, the retention of the project site in its present rural and relatively undeveloped state would eliminate the future income, annual real property and excise tax collections anticipated with the development. Besides, the no-action alternative would not obtain the objectives of the proposed action. The objectives of the project include expanding employment opportunities, and providing service facilities for the area.

B. ALTERNATIVES FOR THE ACTION WHICH COULD FEASIBLY ATTAIN THE OBJECTIVES OF THE ACTION

1. Complete Development as Light Industrial Subdivision

This alternative would involve the construction of light industrial subdivision lots on the Residential-zoned portions of the site. While the Comprehensive Zoning Code specifies that this alternative is presently legally impossible, the developer could seek a change in zoning. This alternative will result in increased income. However, this alternative was not selected because it would require rezoning and possibly result in amplifying the adverse environmental effects outlined in the previous section.

2. Complete Development As Residential Subdivision

The project site's present zoning will not allow total development as a residential subdivision. To implement this alternative, the light industrially zoned lands would have to be rezoned to residential. However, as reported by the Market Study (Appendix I), there is limited vacant land zoned industrial in the Kahaluu-Kaneohe area

and therefore there is a greater need for industrial rather than agricultural use of the project site. Complete development as a residential subdivision would cause similar physical impacts as reported for the proposed service facilities in the area.

3. Development of Agriculture

Agricultural development of the project site is theoretically possible, however it is not an economically viable alternative (Appendix J - Agricultural Feasibility Study). The soils of the project site are suitable for growing wetland crops such as taro, rice and watercress. However, historically, many farmers of taro or rice found their crops could not successfully compete at the market place with similar crops grown elsewhere. Additionally, the water requirements for taro production or aquaculture are prohibitive to make this alternative attractive.

Agricultural use of the land has physical environmental impacts similar in nature to urban development. Specifically, flooding of crops during heavy rainfall resulting from stormwater runoff is not acceptable. A drainage system would be required to channelize stormwater flow around any agricultural development. This would result in increased sediment transport within the North Waihee Stream channel and ultimately into Kaneohe Bay. Due to the use of fertilizers and possible pesticides associated with agriculture, there would also be a further potential impact of the water quality of Kaneohe Bay.

However, agricultural use would not have appreciable impact on traffic, public facilities or the existing social character of the area.

4. Postponing Development Until a Future Time

Postponing development will in effect postpone the adverse effects that may be expected with the implementation of the proposed action. In addition, this alternative is essentially the same as no-action. This alternative would not obtain the objectives of the proposed action.



Agricultural development of the project site can only obtain similar basic objectives of the proposed industrial subdivision if it can be demonstrated that agriculture is economically viable on a scale comparable to industrial development. It is clear that there is a major difference between the economic viability of industrial development and agricultural development for the project site. Industrial development appears viable; agricultural utilization cannot provide an economic return on an investment.

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

Inherent in any intensification of land use is the trade-off between short-term environmental gains at the expense of long-term losses and vice-versa. The construction of this project is no exception. The proposed light industrial subdivision forecloses future options in the sense that the site is anticipated to be committed for the life of the structures that are anticipated to be built on the lots. Given our present-day economics, it is not feasible that at the end of the useful life of the structures, the buildings and paved roadways be torn up and the parcel returned to its present undeveloped state. However, it should be noted that the project site is zoned for light industrial and residential uses and, therefore, the proposed action shall commit the site to its intended use. Furthermore, it should be evident that in the event that the proposed action is not implemented, the high cost of the land and property taxes (as the result of zoning designation) forecloses lower intensity land uses such as recreation, open space, agriculture.

The long-term benefits associated with the proposed project are: the provision of needed sizable vacant land for industrial use on the Windward side; employment opportunities generated by light industrial businesses, commercial agriculture and service-oriented trades; future annual real property, excise, and income tax collections anticipated with the development.

The proposed action poses no long-term risks to health or safety.

VIII. MITIGATION MEASURES PROPOSED TO MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS

The following are brief descriptions of the mitigation measures proposed to minimize the adverse effects outlined in Section V, item by item.

1. Construction plans and contract specifications will be prepared which specifically require the contractor to obtain a noise permit from the Noise and Radiation Branch of the Department of Health. The Contractor, when applying for the noise permit, must identify the project location, times of operation for equipment exceeding 55 decibels, period that construction activities will occur and the methods that noise will be reduced such as mufflers and enclosures. Based on the information submitted, the Department of Health will issue a noise permit with conditions as well as periodically monitor the job site. Basic permit conditions include the ability to inspect and make recommendations to reduce noise levels. The Department of Health also has the ability to stop work because of excessive noise.

Air quality deterioration is likely to be in the form of fugitive dust generated during construction. State of Hawaii Department of Health Rules and Regulations (Chapter 43, Section 10) specify the control measures that are to be implemented to reduce the effects of this type of emission. The primary control method involves the frequent wetting down of loose soil with water, oil or suitable chemicals. Another control measure is good housekeeping at the construction site.

During the construction phase, the grading operation will be done with adequate erosion control measures to prevent silt and other undesirable matter from entering Kaneohe Bay. Sediment basins will be sized and located throughout the site such that water quality into Kaneohe Bay is not affected. Filter berms will be constructed along the entire ocean frontage. A temporary erosion control plan will be subject to review and approval by the City and County of Honolulu prior to any construction.

To minimize the adverse effects on traffic during the installation of water and sewer lines, the contractor will comply with the traffic control requirements in the Manual on Uniform Traffic Control Device for Streets and Highways. During nonworking hours, all trenching will be bridged by safe non-skid material, all temporary traffic control devices removed, all lanes of traffic will be open to normal traffic flow. In addition,

construction will be limited to the off-peak hours between 8:30 a.m. and 3:30 p.m. and appropriate traffic signs, barricades and signalman will be used to direct and control traffic during construction.

2. The adverse impact on the water quality of Kaneohe Bay resulting from increased sediment loads are proposed to be partially mitigated by designing drainage improvements to as much of a natural condition as possible. The benefits of the proposed mitigation measure are also economically attractive. It is proposed to create a channel 100 feet in width mauka of Kamehameha Highway adjacent to North Waihee Stream. This width allows a slower stormwater runoff velocity within the channel and will allow retention of a natural channel bottom. The proposed channel velocity and natural bottom will mitigate the sediment transport to Kaneohe Bay in comparison to the alternative of a concrete-lined channel.

There is no proposed practical method to substantially reduce anticipated increases in nutrient (nitrogen and phosphorus) loadings entering Kaneohe Bay. However, the increase in total runoff from the site is anticipated to be less than 60 cfs which is approximately 2.0 percent of the total peak stormwater discharge from North Waihee Stream. In turn, the North Waihee Stream drainage basin contributes less than 0.1 percent (130 acre-feet) of the total net runoff (95,500 acre-feet) entering Kaneohe Bay.

3. The second proposed alternative of sanitary sewage disposal involves the collection and treatment of all sewage on-site with ultimate reuse of treated sewage effluent as irrigation water for agriculture. This alternative represents a proposed measure to mitigate and alleviate the permanent demand on the Island's finite water supply presented by the proposed agricultural usage on the residential-zoned portions of the site. The State of Hawaii Department of Health will review and approve the use of the on-site sewage treatment plant and effluent irrigation system.

Ultimately the determination of water availability for the proposed project will be made by the Board of Water Supply after reviewing the Water Master Plan and construction plans for the project. If it is determined that adequate water is not available, this impact will be significantly adverse to to curtail and foreclose the proposed project.

4. Increased air emissions caused by increases in vehicular traffic will be mitigated by use of properly functioning internal combustion engines and appropriate air emission devices as required by law.

5. After completion of the subdivision, lessees or owners will develop plot plans with landscaping as desired and in accordance with the Comprehensive Zoning Code (CZC) landscaping requirement. Landscaping requirements for an industrial subdivision specifically call for landscaping to minimize potential adverse influences in the same or neighboring zoning districts. It is anticipated that landscaping will increase sound shielding and absorption and therefore mitigate some of the increases in ambient noise levels.

6. The aesthetic loss of replacing open and vacant land with urbanized land is proposed to be partially mitigated by landscaping and building controls as defined by the Comprehensive Zoning Code. The CZC implements standards for lot areas, widths, yard spacing, maximum density, height, types of signs, parking and landscaping.

7. To mitigate the probable increase in traffic on Kaneohe Bay and neighboring collector streets, appropriate channelization at the intersection of Kamehameha Highway and the roadway to the mauka section is proposed. The channelization may take the form of storage lanes for vehicles entering and leaving the project as well as acceleration and deceleration lanes to ensure that vehicles can enter and leave Kamehameha Highway with a minimum of interruption to through traffic. The State Department of Transportation will dictate the scope of work to ensure that the improvements within the State right-of-way are acceptable.

8. The proposed project will pay a water development charge which is proportionate to the depletion of the existing source capacity resulting from the project. The additional draw on Hawaiian Electric and Hawaiian Telephone service capacity will be mitigated by the project owners in terms of monthly fees. All utility lines serving the project will be placed underground to eliminate any visual impact which they might cause. The depletion of public services will be mitigated in the form of taxes paid by the project occupants.

9. The expressed opposition to the project by the Kahaluu Neighborhood Board and Hui Malama Aina O'Koolau will be mitigated by fully discussing all information possible to allow a rational weighing of the benefits of the project as opposed to the losses. This will be implemented by processing this document as well as scheduling community meetings.

IX. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Construction of the proposed project will commit the site from its present undeveloped state to light industrial and either agricultural or residential use for the expected life of the structures. As explained earlier, this in a sense irreversibly curtails the range of potential uses of the environment. The permanently altered landscape will make it difficult for present residents and future generations to study the history of the region; otherwise, there will be no loss of significant archaeological or historical resources. Construction of the proposed development will not result in the loss of rare or endangered vegetation or animal species, however the limited value of the wetland will be lost.

The commitment of resources required to accomplish the project includes labor, materials, and energy, which are mostly unrenowable and irretrievable. After the project is completed, the new residents will consume potable water and petroleum-generated electricity which also represents the irretrievable commitment of resources.

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

The purpose of this section is to indicate what other interests and considerations of governmental policies other than compliance with regulatory requirements associated with construction are thought to offset the adverse environmental effects of the proposed action, outlined in Section V. The most significant manner in which the proposed action fulfills governmental policies and therefore is thought to offset any adverse effects not mitigated to the extent practicable is through the satisfaction of the State and County goals which encourage increased employment opportunities and the provision of facilities in suitable locations which would support Hawaii's industries. Economic Objective (a)(2) of the Hawaii State Plan states, "Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people."

The objectives of the Hawaii Coastal Zone Management (CZM) Program for economic use of the CZM area is to: "Provide public or private facilities and improvements important to the State's economy in suitable locations."

Under the Economic Activity area of concern of the City and County of Honolulu General Plan, Objective A states: "To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living." In addition, Policy G-3 of the same section states: "Maintain sufficient land in appropriately located industrial areas to help ensure a favorable business climate for Oahu's industries."

It is felt that the development does not present any substantial adverse effects and therefore the benefits of the creation of an industrial subdivision are thought to offset the costs to the environment.

There are no reasonable alternatives to the proposed action that would realize the stated anticipated economic benefits and would also avoid some or all of the adverse effects. The alternative of development to a lower density use would result in a lower amount of available lots for industrial use and would not generate as many employment opportunities. Complete development of the site to a residential subdivision would create temporary employment during construction and a few permanent jobs in service-oriented trades; however, this alternative would represent an underutilization of the site in an area of



limited vacant land zoned industrial. Likewise, agricultural development throughout the site would not feasibly attain the objectives of the proposed action. The alternatives of no action and postponing development until a future time would avoid some or all of the adverse environmental effects; however, the stated anticipated economic benefits would not be realized.

## XI. ORGANIZATIONS AND PERSONS CONSULTED

In anticipation of a Department of Land Utilization determination that the proposed action requires an Environmental Impact Statement, an EIS Preparation Notice was prepared by the applicant's engineering consultants, Gray, Hong and Associates, Inc. The expected decision to require an EIS is based on the project site's location within the Special Management Area (SMA). Since the proposed action involves construction within the SMA, a Special Management Area Use Permit is required prior to construction. In compliance with the Department of Land Utilization, an accepted EIS which addresses the significance of the proposed project within the SMA will be submitted concurrently with the SMA application.

The EIS Preparation Notice was submitted to the State of Hawaii Environmental Quality Commission on August 3, 1981 and was published in the August 8, 1981 EQC Bulletin under the section, "Register of Shoreline Protection Act Documents." Upon a preparation notice's appearance in the EQC Bulletin, regulations stipulate that the applicant is expected to circulate to various governmental and civic agencies a copy of the Notice and a written request for consultation comments to aid in the preparation of the EIS. Copies of this EIS Preparation Notice were mailed out on August 3, 1981 to the organizations and persons identified in Table 7 of the EIS. The consulted parties have a period of thirty (30) days from the receipt of the request for comments, to provide written comments. Upon written request by a consulted party, the period for comments may be extended another 30 days. In compliance with the latter regulation, a written request by Hui Malama Aina O'Koolau dated September 2, 1981 extended the consultation period to October 6, 1981, thirty-two days from the day a copy of the EIS Preparation Notice was sent to them. Hui Malama Aina O'Koolau was sent a copy of the Notice during the August 3, 1981 mailing, but unfortunately their copy was incorrectly addressed. Table 7 identifies the 29 organizations and agencies that were sent a copy of the EIS Preparation Notice.

Eighteen (18) letters were received in response to the EIS Preparation Notice. All except one written response offered comments to the Notice. Of those comments that identified specific concerns that should be addressed in the EIS, these included: drainage improvements, proposed sanitary sewage disposal alternatives, traffic impacts, impacts on existing City bus service,

potential of agricultural use of the project site, impacts on agricultural activities in the surrounding area, archaeological resources, wetland designation, flood insurance designation, relationship of the proposed action to land use plans, CZM objectives, proximity to Kahaluu Beach Park, and noise impacts. Table 7 identifies the organizations and agencies who responded with written consultation comments to the EIS Preparation Notice (by indicating the date of comment), and the date of the response to the comment.

Persons and firms responsible for the preparation of this EIS include: Gray, Hong & Associates, Inc., Civil and Sanitary Engineering; Cowell & Co., Inc., Real Estate Consultants; Alexander & Baldwin, Inc.; Archaeological Consultants of Hawaii; Gordon L. Dugan, Ph.D., Environmental Consultant; Evangeline J. Funk, Botanist; and Andrew J. Berger, Ph.D., Zoologist. Portions of a previously accepted EIS, entitled "Kahaluu Commercial and Residential Development" prepared for Market City, Ltd., have also been used in this EIS within the context of Chapter 343 EIS Regulations. Particularly, the "Air Quality Study" as prepared by Mr. Barry D. Root was appended and considered applicable to the project. In addition, Mr. Henry Tuck Au's "Traffic Impact Statement" was appended. However, only baseline traffic projections were utilized for the preparation of the Kahaluu Industrial EIS.

A. REPRODUCTION OF COMMENTS AND RESPONSES MADE DURING THE CONSULTATION PERIOD

TABLE 7

AGENCIES AND ORGANIZATIONS INVOLVED IN THE CONSULTATION PERIOD

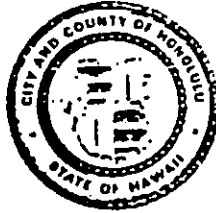
<u>Agency</u>	<u>Date Notice Mailed</u>	<u>Date of Comment</u>	<u>Date of Response</u>
<u>City and County of Honolulu</u>			
Honolulu Fire Department	8/03/81	8/12/81	8/24/81
Department of General Planning	8/03/81	9/03/81	9/10/81
Department of Parks & Recreation	8/03/81	8/17/81	9/16/81
Board of Water Supply	8/03/81	8/20/81	9/08/81
Honolulu Police Department	8/03/81	8/20/81	9/15/81
Department of Public Works	8/03/81	8/18/81	9/09/81
Department of Transportation Services	8/03/81	9/08/81	9/15/81
<u>State</u>			
Department of Agriculture	8/03/81	9/09/81	9/11/81
Department of Transportation	8/03/81	8/18/81	9/11/81
Department of Planning and Economic Development	8/03/81	8/25/81	9/08/81
Department of Land and Natural Resources	8/03/81	9/03/81	9/15/81
Department of Health	8/03/81	8/19/81	9/11/81
Office of Environmental Quality Control	8/03/81	None	--
Environmental Center, University of Hawaii	8/03/81	None	--
Water Resources Research Center, University of Hawaii	8/03/81	8/26/81	9/08/81
<u>Federal</u>			
Department of the Army, Corps of Engineers	8/03/81	9/03/81	9/09/81
U.S. Department of the Interior, Fish & Wildlife	8/03/81	8/13/81	9/09/81
U.S. Department of Agriculture, Soil Conservation Service	8/03/81	9/09/81	9/16/81
<u>Other</u>			
Life of the Land	8/03/81	None	--
American Lung Association of Hawaii	8/03/81	None	--
Kaneohe Neighborhood Board No. 30	8/03/81	None	--
Kaneohe Outdoor Circle	8/03/81	None	--
Kaneohe Bay Community Association	8/03/81	None	--
Kaneohe Business Group	8/03/81	None	--
Sierra Club	8/03/81	None	--
Kaneohe Community Council	8/03/81	None	--
Kahaluu Neighborhood Board No. 29	8/03/81	8/26/81	10/26/81
Key Project	8/03/81	None	--
Hui Malama Aina O'Koolau	9/04/81	10/06/81	10/23/81

FIRE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

1455 S. BERETANIA STREET, ROOM 305  
HONOLULU, HAWAII 96814

15 AUG 14 1981  
File: 980  
To: DB/US  
Action: [unclear]  
M. M. NONAKA  
CHIEF

EILEEN R. ANDERSON  
MAYOR



August 12, 1981

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
Consulting Engineers  
116 South King Street, Rm. 508  
Honolulu, Hawaii 96813

Dear Mr. Gray:

We have no objections to the proposed projects. The Kahaluu Fire Station is less than a mile away from the proposed project. Supportive fire service will be provided by both the Kaneohe and Kaaawa Fire Stations.

Sincerely,

A handwritten signature in cursive script, appearing to read "Melvin M. Nonaka".

Melvin M. Nonaka,  
Fire Chief

MMN:ct/LS

August 24, 1981

Mr. Melvin M. Nonaka, Fire Chief  
Fire Department  
City & County of Honolulu  
1455 South Beretania St., Room 305  
Honolulu, Hawaii 96814

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
TMK: 4-7-13: 01, 10, 11, 12, 16 & 24

Dear Mr. Nonaka:

We have received your comments of August 12, 1981 on the above mentioned project. The information provided in your letter on the project's impact on fire protection services will be incorporated in the EIS. We appreciate your prompt review and reply on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Daniel S. C. Hong

DB:vs:mp

988

XI - B1



United States Department of the Interior

FISH AND WILDLIFE SERVICE

300 ALA MOANA BOULEVARD  
P. O. BOX 50167  
HONOLULU, HAWAII 96850

Date Received: 9/13/81  
File: DB/145/125  
To: \_\_\_\_\_

Action: IN REPLY REPORTS  
ES  
Room 6307

AUG 13 1981

Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Re: EIS Preparation Notice  
Kahaluu Industrial Project,  
Oahu, Hawaii

We have reviewed the EIS Preparation Notice for the referenced project and visited the project site. It appears at least part of the site is a wetland since bullrushes were observed growing there. If part of the project site is in fact a wetland, a permit in accordance with Section 404 of the Clean Water Act will be required before construction can begin.

The Service has requested the Corps of Engineers to determine if all or part of the site is a wetland within their permit jurisdiction. For your information, we generally recommend denial of permits for non-water dependent projects unless the project includes appropriate mitigation/compensation. The above matters should be thoroughly covered in your EIS.

We appreciate this opportunity to comment.

Sincerely yours,

Ernest Kosaka  
Project Leader  
Office of Environmental Services

cc: NMFS  
HDF&G  
EPA, San Francisco



Save Energy and You Serve America!  
XI - A2

September 9, 1981

Mr. Ernest Kosaka, Project Leader  
Office of Environmental Services  
United States Department of the Interior  
Fish & Wildlife Service  
P. O. Box 50167  
Honolulu, Hawaii 96850

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Kosaka:

This is in response to your comments of August 13, 1981, on the above mentioned EIS Preparation Notice. For your information, as of September 3, 1981, the Corps of Engineers is still in the process of determining whether a Department of the Army Permit is required for this project.

We appreciate your review and comments of this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp

988

XI - B2



POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96814 - AREA CODE (808) 955-8111

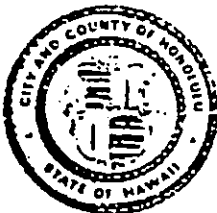
AUG 20 1981

EILEEN R. ANDERSON  
MAYOR

File: 988

To: D.B.

Action: FRANCIS KEALA  
CHIEF



OUR REFERENCE EFS-MJP

August 17, 1981

Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement Preparation Notice  
for the Proposed Kahaluu Industrial Project,  
Kahaluu, Oahu, Hawaii

At this early stage in the planning for this project, we have only one obvious concern. That is to avoid the potential traffic hazards that this development may involve.

Part of our concern stems from the fact that Kamehameha Highway is only two lanes wide in this area. Any significant volume of traffic (especially of large trucks) attempting to make left turns into the project site(s) is going to create congestion and hazards on the highway. This problem will be compounded by the increased traffic flow that will be generated by the Kahaluu residential and commercial development planned for the area south of your project. To reduce the potential hazards, we would favor widening the highway to create left turn lanes for traffic moving in both directions.

Another part of our concern involves the placement of access roads connecting the project site(s) to the highway. The intersection of Kamehameha Highway and Waihee Road will have to bear an increasing volume of traffic due to the residential and commercial development planned for the area between Waihee Road and Kahaluu Stream. To avoid unnecessary congestion in the area, it would help to have your access roads placed as far as possible from that intersection.

Sincerely,

FRANCIS KEALA  
Chief of Police

By *Shigeji Kogachi*  
SHIGEJI KOGACHI  
Acting Assistant Chief  
Administrative Bureau

September 15, 1981

Mr. Francis Keala, Chief of Police  
Police Department  
City & County of Honolulu  
1455 South Beretania Street  
Honolulu, Hawaii 96814

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Keala:

We have reviewed your letter of August 17, 1981, commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments to your concerns:

1. A traffic analysis is being prepared for the proposed project. The traffic analysis will incorporate a discussion of highway widening to create turning lanes as a potential method to mitigate increased traffic congestion.
2. The proposed access to the project will be 800+ feet from the intersection of Waihee Road and Kam Highway. Since the project fronts Kam Highway for a distance of 1100+ feet, we believe the proposed intersection is as far as practically possible from Waihee Road.

We appreciate your review and response on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp

DEPARTMENT OF PARKS AND RECREATION  
**CITY AND COUNTY OF HONOLULU**

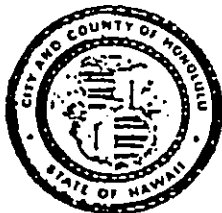
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

AUG 24 1981  
Date Received

DB/VS

Action:

EILEEN R. ANDERSON  
MAYOR



ROBERT K. MASUDA  
DIRECTOR

August 17, 1981

Mr. Brian Gray  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Gray:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT  
PREPARATION NOTICE  
KAHALUU INDUSTRIAL PROJECT  
TMK: 4-7-13: 01, 10, 11, 12, 16 & 24

We have reviewed the Environmental Impact Statement Preparation Notice for the proposed Kahaluu Industrial Project and make the following comments.

We have no objection to the proposed project in general, except for the development of the shoreline makai of Kamehameha Highway. Although the area is zoned for Light Industry, we feel that it would be more beneficial and compatible if the area were left as open space.

The area is located adjacent to our existing Kahaluu Beach Park and preservation of the area for open space and also as an extension of Kahaluu Beach Park would be more appropriate.

Thank you for allowing our Department to comment on the proposed Kahaluu Industrial Project.

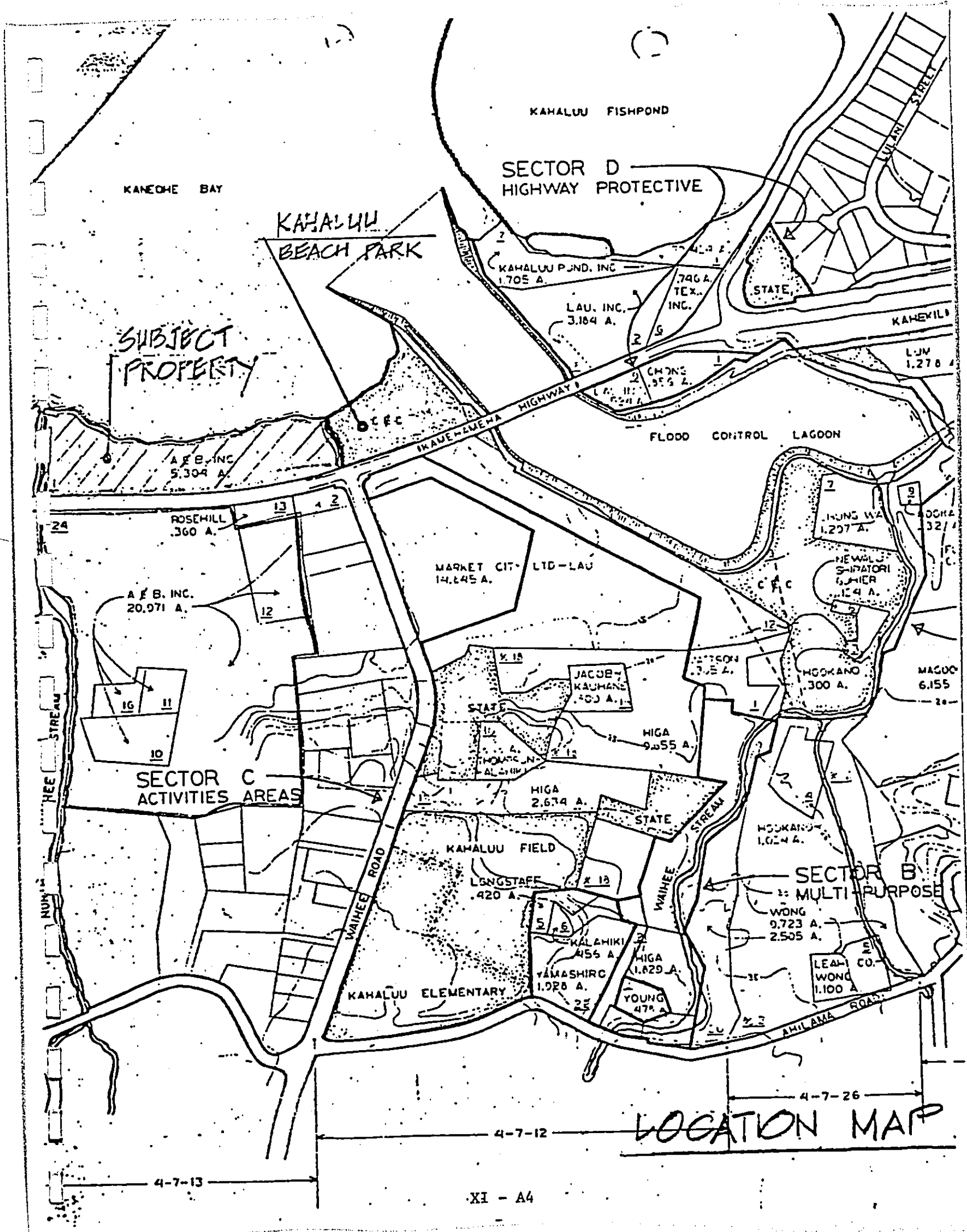
Sincerely yours,

  
ROBERT K. MASUDA, Director

Attach.

RKM:vc

cc: DLU



September 16, 1981

Mr. Robert K Masuda, Director  
Department of Parks & Recreation  
City & County of Honolulu  
650 South King Street, 10th Floor  
Honolulu, Hawaii 96813

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu Hawaii

Dear Mr. Masuda:

This is in response to your comments of August 17, 1981 on the above mentioned EIS Preparation Notice. At present, the lands makai of Kam Highway are zoned light industrial. It is presently intended that these lands be developed to support the permitted uses as defined by the City & County of Honolulu Comprehensive Zoning Code. The proposed project will comply with the City's Shoreline Access Ordinance No. 4311 and the City's Park Dedication Ordinance No. 4621 as applicable. However, it is believed that additional lands for the purpose of extending Kahaluu Beach Park should be acquired by other methods, i.e. condemnation.

Should you have any questions or require further information, please contact our office.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp

Date Received 8.13.81

908  
9/13/81  
Action: answered



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION

STP 8.7543

August 18, 1981

Gray, Hong & Associates, Inc.  
Consulting Engineers  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Gentlemen:

Thank you for the opportunity to comment on the subject  
EIS preparation notice.

We suggest that the EIS address the existing and proposed  
width of Kamehameha Highway right-of-way. We believe the  
city's master plan calls for a 35-foot highway set back on  
each side of Kamehameha Highway.

Very truly yours,

Ryokichi Higashionna  
Director of Transportation

September 11, 1981

Mr. Ryokichi Higashionna, Director  
State of Hawaii  
Department of Transportation  
869 Punchbowl Street  
Honolulu, Hawaii 96813

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Higashionna:

We have received your letter of August 18, 1981 commenting on the above mentioned EIS Preparation Notice. We are aware of the 35-foot highway set-back and have designed the subdivision accordingly; this will be stated in the EIS.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp

988

XI - B5

DEPARTMENT OF PUBLIC WORKS  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

Date Received **AUG 24 1981**

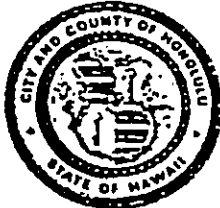
File: **988**

To: **DB/05**

Action: \_\_\_\_\_

**MICHAEL J. CHUN, Ph.D.**  
DIRECTOR AND CHIEF ENGINEER

EILEEN R. ANDERSON  
MAYOR



ENV 81-313

August 18, 1981

Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Gentlemen:

Re: EIS Preparation Notice for the Proposed  
Kahaluu Industrial Project, Kahaluu, Oahu

We have the following comments with respect to the EIS for the proposed project.

1. The operation and maintenance of the proposed wastewater treatment plant should be discussed in the EIS. Also sludge and effluent disposal plans should be included in the discussion. Finally, a certified operator should be retained to comply with Article 340 B-6 of the Hawaii Revised Statutes.
2. The project site is in a FIA Flood Hazard Area Zone A. A flood determination study should be submitted for a general flood plain district in accordance with Article 11 of the Comprehensive Zoning Code as amended (Ordinance 80-62).

Me ke aloha pumehana,

*Michael J. Chun*

F. MICHAEL J. CHUN  
Director and Chief Engineer

cc: Division of Engineering  
Division of Wastewater Management



September 9, 1981

Mr. Michael J. Chun  
Director & Chief Engineer  
Department of Public Works  
City & County of Honolulu  
650 South King Street, 11th Floor  
Honolulu, Hawaii 96813

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolauoko District, Oahu, Hawaii

Dear Mr. Chun:

This is in response to your comments of August 18, 1981 on the above mentioned EIS Preparation Notice. We would like to provide the following responses to your comments:

1. While the exact method of sewage disposal for the proposed project has not yet been determined, the operation and maintenance of the proposed wastewater treatment plant and effluent disposal plan alternatives will be discussed in the EIS. The need for a certified operator will also be referenced.
2. The U. S. Corps of Engineers has determined that most of the proposed project site lies within Zone A and the remainder lies in Zone C of the FIA Flood Hazard Area.

A flood determination study will be submitted in order to comply with Article 11 of the Comprehensive Zoning Code as amended (Ordinance 80-62). A drainage report and flood hazard evaluation will also be included in the Draft EIS.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp

988

XI - B6

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



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

August 19, 1981

Date Received AUG 20 1981

File: \_\_\_\_\_

To: VB

Action: \_\_\_\_\_

GEORGE A. L. YUEN  
DIRECTOR OF HEALTH

JOHN F. CHALMERS, M.D.  
DEPUTY DIRECTOR OF HEALTH

HENRY N. THOMPSON, M.A.  
DEPUTY DIRECTOR OF HEALTH

MELVIN K. KOIZUMI  
DEPUTY DIRECTOR OF HEALTH

ABELINA MADRID SHAW, M.A., J.D.  
DEPUTY DIRECTOR OF HEALTH

In reply, please refer to:  
File: **EPHS-SS**

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 S. King St., Rm. 508  
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Request for Comments on Proposed Environmental Impact Statement (EIS)  
for Kahaluu Industrial Project, Kahaluu, Koolaupoko District, Oahu

Thank you for allowing us to review and comment on the subject proposed EIS.

We submit the following comments for your information and consideration:

Sewage Disposal

The proposed project should be hooked up to a municipal wastewater treatment works.

Noise

1. If the site should be divided into industrial and residential usages, noise problems are anticipated from such development. Noise from activities associated with the proposed industrial facilities can have an adverse effect on the adjacent residential community.
2. Noise from any proposed industrial or agricultural activities may also have an adverse effect on existing residential areas. Plans should be made to minimize the noise from such activities to prevent possible annoyances.
3. Through facility design, noise from any proposed equipment, such as air conditioning/ventilation units, exhaust units and compressors, must be attenuated to meet the allowable levels of Public Health Regulations, Chapter 44B, Community Noise Control for Oahu.
4. Activities associated with construction phase must comply with the provisions of Public Health Regulations, Chapter 44B, Community Noise Control for Oahu.
  - a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable noise levels of the regulations.
  - b. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must have a muffler.

August 19, 1981

-2-

Mr. Brian L. Gray

- c. The contractor must comply with the conditional use of the permit as specified in the regulations and the conditions issued with the permit.
5. Traffic noise from heavy vehicles traveling to and from the construction site must be minimized in residential areas and must comply with the provisions of Public Health Regulations, Chapter 44A, Vehicular Noise Control for Oahu.

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.

Sincerely,

*Brian L. Gray*

for

MELVIN K. KOIZUMI  
Deputy Director for  
Environmental Health

September 11, 1981

Mr. Melvin K. Koizumi, Deputy Director  
Environmental Health  
State of Hawaii  
Department of Health  
P. O. Box 3373  
Honolulu, Hawaii 96801

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Koizumi:

We have reviewed your letter of August 19, 1981, commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments to your concerns:

1. Sewage Disposal

The project Engineer is investigating the sewage treatment and disposal alternatives which will meet the Department of Health's requirements. A description of the alternative methods of sewage disposal will be included in the EIS.

2. Noise

- a. While there may be an increase in ambient noise levels as a result of the commercial activities and automobiles generated by the proposed project, this noise is not expected to exceed the current noise standards established by PHR, relating to vehicular and community noise. If residential use is proposed for the project site, the effects of noise from activities associated with the proposed light industrial subdivision will be discussed in the EIS.
- b. The applicant only proposes to construct a light industrial subdivision with roadways, drainage and water systems, and sewage disposal system. No buildings are being proposed to be built and therefore, the suggested noise mitigating design features are not applicable. However, review and control over this area will be most appropriate when individual lot owners or lessees apply for building permits.
- c. We appreciate the information provided on the provisions of Public Health Regulations, Chapter 44B, Community Noise Control for Oahu. The contractor will comply with the provisions of the regulations, this will be stated in the EIS.

Mr. Melvin K. Koizumi, Deputy Director  
Environmental Health  
September 11, 1981  
Page Two

- d. The contractor will also comply with the provisions of Public Health Regulations, Chapter 44A, Vehicular Noise Control for Oahu; this will also be stated in the EIS.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:Mp

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

EILEEN R. ANDERSON, Mayor

YOSHIE H. FUJINAKA, Chairman  
Robert A. Souza, V-Chm.  
MICHAEL J. CHUN  
RYOKICHI HIGASHIONNA  
DONNA M. HOWARD  
Dat Quon Pang  
CLAUDE T. YAMAMOTO

Date Received AUG 28 1981

972

DP/1/1

August 20, 1981

KAZU HAYASHIDA  
Manager and Chief Engineer

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
Room 508  
116 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Gray:

Subject: Your Letter of August 3, 1981 on  
the Environmental Impact Statement (EIS)  
Preparation Notice for the Proposed  
Kahaluu Industrial Project,  
TMK: 4-7-13: 10, 11, 12, 16, 24

We have the following comments on the EIS Preparation  
Notice:

1. Item 5, page 3, under Environmental Characteristics,  
should be revised to indicate that water availability  
and water development charges will be determined at  
the time the Building Permits are submitted for our  
review and approval.
2. The developer is required to submit a water master  
plan for our review and approval.

If you have any questions, please contact Lawrence Whang  
at 548-5221.

Very truly yours,



KAZU HAYASHIDA  
Manager and Chief Engineer

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

September 8, 1981

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE

Mr. Kazu Hayashida  
Manager & Chief Engineer  
Board of Water Supply  
630 South Beretania Street  
Honolulu, Hawaii 96813

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Hayashida:


We have reviewed your letter of August 30, 1981 commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments:

1. The EIS Preparation Notice is a notice of determination that a proposed action requires the preparation of an EIS. Instead of the suggested revision to the EIS Preparation Notice, the information provided on water availability and water development charges will be incorporated into the Draft EIS.
2. The developer will comply with the requirement to submit a water master plan for your review and approval. The Draft EIS will address all alternatives to provide water for the site and the impact of each alternative, if the water master planning is not resolved by the time the Draft EIS is officially submitted.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

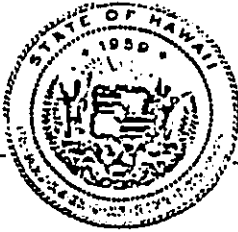
  
\_\_\_\_\_  
Brian L. Gray

DB:vs:mp

988

116 SOUTH KING STREET, RM. 508, • HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306

XI - B8



DEPARTMENT OF PLANNING  
AND ECONOMIC DEVELOPMENT

Kamamalu Building 250 South King St. Honolulu, Hawaii • Mailing Address P O Box 2359 Honolulu Hawaii 96804

Received  
File: GEORGE R. ARIYOSHI  
HIDETO KONO  
Action: FRANK SKRIVANEK

August 25, 1981

Ref. No. 3521

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Gray:

SUBJECT: Environmental Impact Statement Preparation Notice  
for the Proposed Kahaluu Industrial Project, Kahaluu  
Koolaupoko District, Oahu, Hawaii

Thank you for giving us the opportunity to review the subject EIS  
Preparation Notice.

Since the Hawaii Coastal Zone Management (CZM) Program's statutory  
concerns address water quality coastal ecosystems, scenic and historic  
resources, and economic uses in the coastal zone, we recommend that the EIS  
include a discussion of relevant CZM objectives and policies. This will  
assist decision-making agencies, since the CZM policies are binding on  
their actions within the State's coastal zone.

We have no further comments to offer at this time, but would  
appreciate the opportunity to review the Draft EIS on this project when it  
is completed.

Sincerely,

*Frank Skrivaneck*  
for Hideto Kono

cc: Office of Environmental Quality Control



September 8, 1981

Mr. Hideto Kono, Director  
State of Hawaii  
Department of Planning & Economic Development  
P. O. Box 2359  
Honolulu, Hawaii 96804

SUBJECT: EIS Preparation Notice for the Proposed  
Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Kono:

This is in response to your comments of August 25, 1981 on the above mentioned EIS Preparation Notice. As recommended, a discussion of relevant objectives and policies of the Hawaii Coastal Zone Management Program will be incorporated into the EIS.

Please be assured that your office will be forwarded a copy of the Draft EIS when it is completed.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

\_\_\_\_\_  
Brian L. Gray

DB;vs:mp

9888



# University of Hawaii at Manoa

Water Resources Research Center  
Holmes Hall 283 • 2540 Dole Street  
Honolulu, Hawaii 96822

REC'D AUG 23 1981  
Date Received: 8/23/81

File: 982

To: DB/MS

Action: [unclear]

26 August 1981

Gray, Hong & Associates, Inc.  
116 South King St., Room 508  
Honolulu, Hawaii 96813

Gentlemen:

Subject: EIS Preparation Notice for the Proposed Kahaluu  
Industrial Project, Kahaluu, Koolaupoko District,  
Oahu, Hawaii

We have reviewed the subject preparation notice and have no  
comments to offer at this time. Thank you for including us in the  
consultation process.

Sincerely,

*Edwin T. Murabayashi*

Edwin T. Murabayashi  
EIS Coordinator

ETM:jmn

cc: H. Gee  
Y.S. Fok

September 8, 1981

Mr. Edwin T. Murabayashi, EIS Coordinator  
Water Resources Research Center  
University of Hawaii at Manoa  
Holmes Hall Room 283  
2540 Dole Street  
Honolulu, Hawaii 96822

SUBJECT: EIS Preparation Notice for the Proposed  
Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Murabayashi:

We have received your comments of August 26, 1981 on the above mentioned project. We appreciate your expeditious review and reply on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

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Brian L. Gray

DB:vs:mp

938

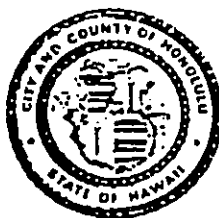
XI - B10

DEPARTMENT OF GENERAL PLANNING  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

DBN:

EILEEN R. ANDERSON  
MAYOR



WILLARD T. CHOW  
CHIEF PLANNING OFFICER

DGP8/81-2694

September 3, 1981

Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Gentlemen:

EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project

We have reviewed the EIS Preparation Notice and feel that discussion on the following topics should be included in your EIS.

Short-term Impact

Short-term impacts will include dust, noise and traffic disruptions due to grading and construction on the site. The extent of these nuisances and the proposed mitigating measures to reduce these problems should be indicated.

Long-term Impact

Longer term effects on environmental quality include: the impact of possible industrial discharges (pollutants) in surface runoff into the unnamed stream that borders the north-west boundary of the property and its eventual flow into Kaneohe Bay; increased vehicular air emissions; increased noise from the project site; significant alteration of the land involved and increased visibility from the surrounding areas.

Relationship to Land Use Plans

The proposed development is consistent with the present zoning and Detailed Land Use Map; however, the adopted General Plan and the proposed Development Plan call for maintaining the area in a rural and/or agricultural setting. Further, the

Gray, Hong & Associates, Inc.  
Page 2

project will commit the land to urban use, thereby foreclosing use of the site for agricultural activities. It should be noted that the zoning is based on old plans and assumptions no longer valid; e.g., location of the Standard Oil Refinery now at Barbers Point and harbor development which the Corps of Engineers could not justify.

Sewage Disposal System

A discussion of the sewage disposal system, whether the developer will provide an on-site sewage treatment plant and effluent disposal system or connect to the City's sewer facilities when they are completed, should be included.

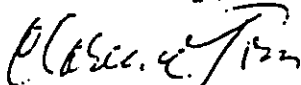
Other

The effect of eliminating the wetlands located on the project site including the anticipated impacts on any identified endemic and endangered species of plants, animals or birds.

The effect of converting a sizeable portion of land area from the Waihee drainage basin into urban use and the potential drainage problems which may arise because of the proposed action. The disposition of drainage from the site should be discussed. Drainage flows should be quantified.

The area is subject to flooding. Mitigation measures should be described and quantified; e.g., how much fill will be required, from where? There may be soil problems.

Sincerely,



for RALPH KAWAMOTO  
Planner

APPROVED:

  
WILLARD T. CHOW

cc: DLU

September 10, 1981

Mr. Willard T. Chow  
Chief Planning Officer  
Department of General Planning  
City & County of Honolulu  
650 South King Street, 8th Floor  
Honolulu, Hawaii 96813

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, District, Oahu, Hawaii

Dear Mr. Chow:

We have reviewed your letter of September 3, 1981, commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments to your concerns:

1. As suggested, short-term impacts, including any dust, noise and traffic generated by the proposed action and the proposed mitigating measures, will be discussed and incorporated in the EIS.
2. We appreciate the suggested possible long-term impact that might be associated with the proposed action. Please be assured that these topics will be discussed in the EIS.
3. Presently, the project site is zoned Light Industrial, R-6 and R-3 Residential Districts. The existing General Plan Detailed Land Use Map (DLUM) designates the project site for light industrial and residential uses. The proposed Development Plan (DP) designates the site for preservation and agricultural use. However, it is not known if the development plans will be adopted in their present form. A proposed agricultural designation for lands which have not been able to support agriculture for the last 100 years may be questionable.

It should be noted that the existing zoning of the site prevails over general planning for the project site. The recent State Supreme Court decision (the Nuuanu Neighborhood Board and various individuals versus the Department of Land Utilization, City & County of Honolulu, Michael McElroy, Director of Land Utilization, and Dowsett Highlands Land Trust) has interpreted the land use and zoning ordinances and laws to mean that land use plans provide guidance for land use decisions, but zoning prevails when actual land use is implemented. We, therefore, believe it is proper to present the EIS on the basis of the zoning and to merely recognize that future planning decisions may place restrictions on the actual development.

Mr. Willard T. Chow  
Chief Planning Officer  
Department of General Planning  
City & County of Honolulu  
September 10, 1981  
Page Two

4. A description and discussion of the proposed sewer system will be included in the EIS.
5. A fauna survey has already been prepared for the project site, while a flora survey is in the process of being conducted. According to the findings of the fauna survey, there are no native amphibians, reptiles or mammals in the area. Also, there are no endemic birds in the area proposed for development nor in the valley above it. The project site does not provide permanent habitat even for the introduced bird species. Both the flora and fauna surveys will be included in the EIS.
6. A description of the existing drainage and the effects of proposed improvements will be found in this EIS. It should be noted that the Waihee Marsh area is fed by a small unnamed stream sometimes referred to as North Fork Waihee Stream. The medium stream flow of this tributary is less than 1.0 cfs. based on U.S.G.S. information.
7. In the general description of the proposed action's technical characteristics, a description of fill quantities and grading operation will be incorporated in the EIS.

Thank you for your review and comments to this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp



(

DB/VS

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

PODED-PV

3 September 1981

Mr. Brian L. Gray  
Gray, Hong, and Associates  
116 South King Street, Room 508  
Honolulu, HI 96813

Dear Mr. Gray:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice for the Kahaluu Industrial Project, Kahaluu, Koolaupoko District, Oahu, Hawaii, sent to us on 3 August 1981. Based on our review, we provide the following comments:

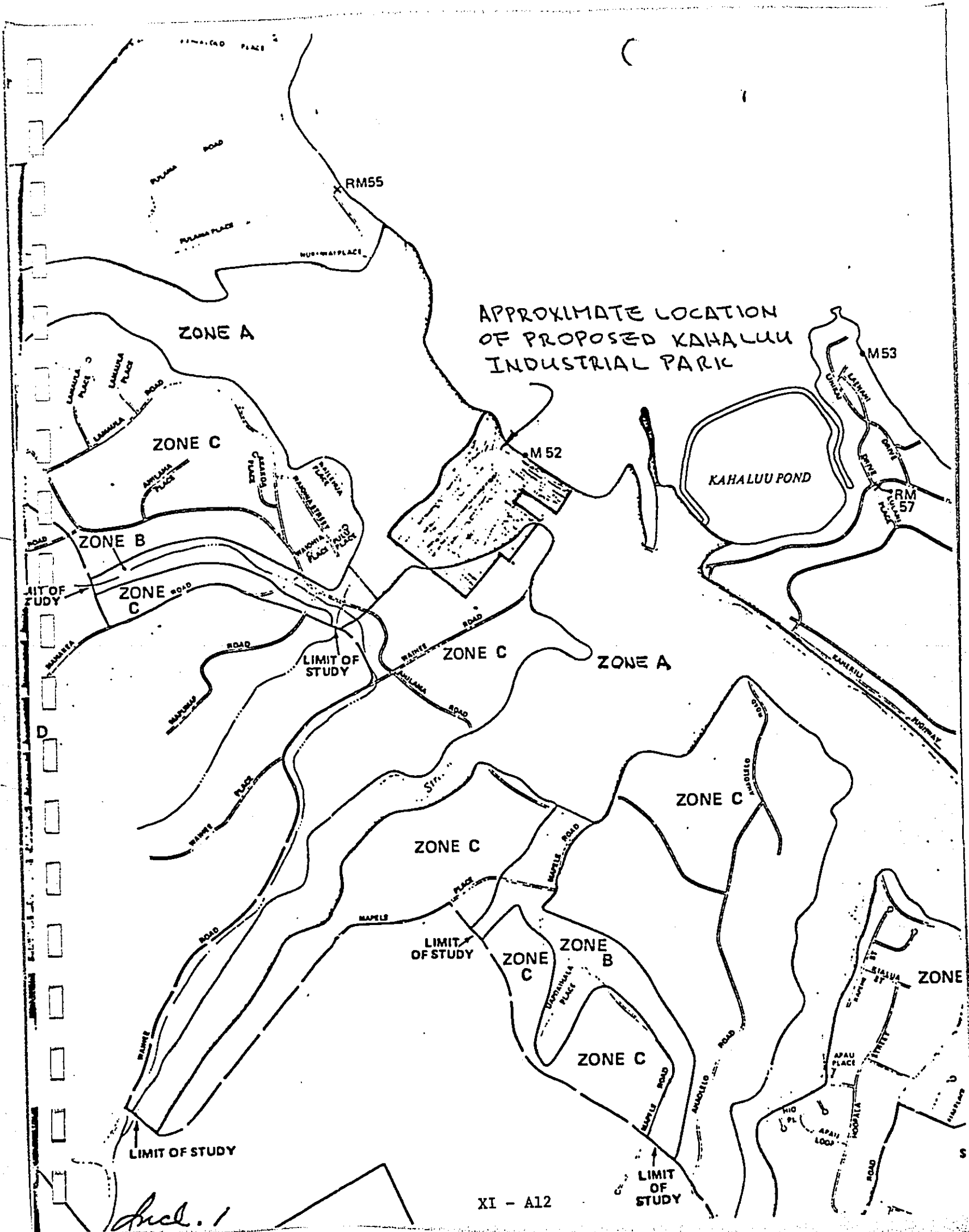
- a. Since a wetland is located on the proposed project site, we are in the process of determining whether a Department of the Army permit is required for this project. We will notify you of our decision when it is determined.
- b. Most of the proposed project site lies within Zone A and the remainder lies in Zone C of the Federal Insurance Administration's Flood Insurance Map (Incl 1). A Flood Plain Management brochure (Incl 2) is also inclosed for your information.

Sincerely,

  
KISUK CHEUNG  
Chief, Engineering Division

2 Incl  
As stated





September 9, 1981

Mr. Kisuk Cheung, Chief  
Engineering Division  
Department of the Army  
U. S. Army Engineer District, Honolulu  
Fort Shafter, Hawaii 96358

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, District, Oahu, Hawaii

Dear Mr. Cheung:

We have received your comments of September 3, 1981, on the above mentioned project. We appreciate the information provided, additionally, we will include the Flood Insurance Rate Map in the EIS being prepared. We hope that your Department of the Army permit determination can be made before the Draft EIS is submitted. However, all alternatives and potential requirements will be evaluated in the EIS, if your determination has not been finalized prior to filing the Draft EIS.

Thank you for your review and comments on this EIS Preparation Notice.

Very truly yours,  
GRAY, HONG & ASSOCIATES, INC.

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Brian L. Gray

DB:vs:mp

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



Date Received SEP 9 1981

SUSUMU ONO, CHAIRMAN  
BOARD OF LAND & NATURAL RESOURCES

File: 928

EDGAR A. HAMASU  
DEPUTY TO THE CHAIRMAN

To: DR/NS

Action: \_\_\_\_\_

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

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

September 3, 1981

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 So. King Street (Room 508)  
Honolulu, Hawaii 96813

Dear Mr. Gray:

We have reviewed the Environmental Impact Statement (EIS) Preparation Notice for the Kahaluu Industrial Project.

We suggest that potential impacts on aquatic environments, aquatic organisms, and on public access to these resources should be considered by the EIS. More specifically, you should describe existing conditions (including organisms present), predicted impacts, and mitigating measures for the described wetland, for the nameless stream along the northern boundaries of the applicant's properties, and for the relevant section of Kaneohe Bay shoreline. Actions of potential concern include, but may not be limited to, vegetation removal, earthmoving, erosion control, extent and location of construction, specific provisions for drainage and sewage, and provisions for public access.

You should also be aware that activity within federally designated wetlands requires a permit from the U. S. Army Corps of Engineers, and that Kaneohe Bay has been designated a "Class AA embayment," with particular restrictions regarding wastewater discharge, by the State Department of Health.

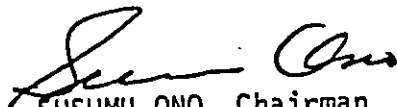
Recent discoveries in the Kailua area have shown that buried sites are likely to be encountered during the early phases of construction. A buried site was found at the edge of Kawainui Swamp. A number of artifacts were also found by workmen during construction at the site of the old Grand Hotel in Kailua. We recommend an archaeologist be hired to monitor the early ground-disturbing phase of the project, and to write a report on the sites and artifacts discovered during the construction.

In the event that any unanticipated sites or remains (such as artifacts, shell, bone or charcoal deposits; human burials; rock or coral alignments,

Mr. Brian L. Gray  
Re: Kahaluu Industrial Project  
September 3, 1981  
Page Two

pavings, or walls) are encountered, please inform your client to stop work and contact our historic sites office at 548-7460 immediately.

Sincerely,



SUSUMU ONO, Chairman  
Board of Land and Natural Resources  
and  
State Historic Preservation Officer

September 15, 1981

Mr. Susumu Ono, Chairman  
Board of Land and Natural Resources  
State of Hawaii  
Department of Land & Natural Resources  
P. O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolauoko, Oahu, Hawaii

Dear Mr. Ono:

We have reviewed your letter of September 3, 1981, commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments to your concerns:

1. A study of the environmental aspects of storm water runoff from the proposed project will be conducted and incorporated into the EIS.
2. We are aware that activity within federally designated wetland requires a Department of the Army permit. However, the Department of the Army Permit Regulations (33 CFR 320) indicate that placement of fill within wetlands is granted by a nationwide permit provided the wetlands are above the "headwaters" of the stream supporting the adjacent wetlands. In this particular case, the Waihee Marsh area is fed by a small unnamed stream sometimes referred to as North Waihee Stream. The medium stream flow of this tributary is less than 1.0 cfs based on U.S.G.S. information. As of September 3, 1981, the Corps of Engineers was still in the process of verifying the applicability of a nationwide Department of the Army Permit for this project.

We appreciate the information provided on the wastewater discharge considerations for the proposed project. The project engineer is investigating the sewage treatment and disposal alternatives which will meet the Department of Health's and/or the City and County of Honolulu Department of Public Works' requirements. A description of the alternative methods of sewage disposal will be included in the EIS.

3. An archaeological reconnaissance was conducted and will be incorporated into the EIS. The archaeologist has determined that there are no above ground archaeological features located within the boundaries of the subject parcel nor any indication that significant features lie buried underneath. However, the archaeologist recommends that in the event that matters of archaeological interest appear at the site during some phase of the construction process, developer consult an archaeologist to monitor further construction. In the event that any unanticipated sites or remains are encountered, the client will stop work and contact the historic sites office.

Mr. Susumu Ono, Chairman  
Board of Land & Natural Resources  
RE: EIS Preparation Notice  
September 15, 1981  
Page Two

We appreciate your review and response on this EIS Preparation Notice.

Very truly yours,  
GRAY, HONG & ASSOCIATES, INC.

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Brian L. Gray

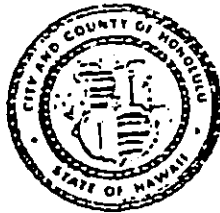
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Enclosure: Archaeological reconnaissance

DEPARTMENT OF TRANSPORTATION SERVICES  
**CITY AND COUNTY OF HONOLULU**

HONOLULU MUNICIPAL BUILDING  
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

SEP 10 1981



EILEEN R. ANDERSON  
MAYOR

1981  
DE/VC  
To: \_\_\_\_\_  
\_\_\_\_\_

ROY A. PARKER  
DIRECTOR

TEB/81-2407

September 8, 1981

Gray, Hong & Associates, Inc.  
116 South King Street  
Honolulu, Hawaii 96813

Gentlemen:

Subject: EIS Preparation Notice for the Proposed  
Kahaluu Industrial Project  
TMK: 4-7-13: 01, 10, 11, 12, 16, 24

The Environmental Impact Statement for this project should include a traffic study which will address the following concerns:

1. The total combined vehicle trips that will be generated from the light industrial subdivision and the agricultural or residential subdivision and its impact on the connecting facilities during the a.m. and p.m. peak hours.
2. The impact it will have on the existing City bus service.

Very truly yours,

*Roy A. Parker*  
ROY A. PARKER  
Director

September 15, 1981

Mr. Roy A. Parker, Director  
Department of Transportation Services  
City & County of Honolulu  
650 South King Street, 3rd Floor  
Honolulu, Hawaii 96813

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Parker:

This is in response to your comments of September 8, 1981, on the above mentioned EIS Preparation Notice. A traffic study that will address the future traffic generated by the proposed project is being prepared and will be incorporated into the EIS. The Environmental Impact Statement will also discuss the proposed project's impact on the existing City bus service.

Thank you for your review and comments.

Very truly yours,  
GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:mp



GEORGE R. ARJYOSHI  
GOVERNOR



JACK K. SUWA  
CHAIRMAN, BOARD OF AGRICULTURE

State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 So. King Street  
P. O. Box 22159  
Honolulu, Hawaii 96822

P.  
Date Received SEP 10 1981  
To: 900  
By: DB/NS  
Action: \_\_\_\_\_

September 9, 1981

Mr. Brian Gray  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, HI 96813

Dear Mr. Gray:

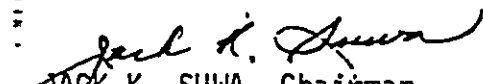
The Department of Agriculture has reviewed the Kahaluu Industrial Project (TMK: 4-7-13; 01, 10, 11, 12, 16, 24), Environmental Impact Statement Preparation Notice and offers the following comments.

The subject area is classified as Other Important Agricultural Land according to the Agricultural Lands of Importance to the State of Hawaii system. According to the Soil Conservation Service Soil Survey the soils of the subject area are Tropaquepts which are suited for growing wetland crops such as taro, rice and watercress.

We note that the applicant proposes to create an agricultural or residential development on the residential-zoned portion of the site. Both alternatives should be thoroughly discussed as to feasibility, compatibility with surrounding uses, and relationship to the City and County of Honolulu's proposed Development Plans, which designate the mauka area as Agriculture and the makai area as Preservation.

We believe the EIS should also address any potential impacts the project as a whole might have on the other agricultural activities located in the area. Specifically, consideration should be given to increased property values, nuisances, and increased pressure to urbanize lands which are currently being used or potentially could be used for agriculture. This should not be limited to just the land adjacent to the subject parcels, but should include lands further mauka which could be affected by spinoff or subsequent urbanization.

Thank you for the opportunity to comment.

  
JACK K. SUWA, Chairman  
Board of Agriculture

"Support Hawaiian Agricultural Products"  
XI - A15

September 11, 1981

Mr. Jack K. Suwa, Chairman  
Board of Agriculture  
State of Hawaii  
Department of Agriculture  
P. O. Box 22159  
Honolulu, Hawaii 96822

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, District, Oahu, Hawaii

Dear Mr. Suwa:

We have reviewed your letter of September 9, 1981, commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments to your concerns:

1. The information provided on the agricultural classification of the soils on the project site will be mentioned in the EIS.
2. As suggested, a discussion of the alternatives of agricultural or residential development on the residential-zoned portion of the site will be included in the EIS. It should be noted that the economics of taro, rice and watercress are not attractive.
3. The EIS will also address any potential impacts the proposed action may have on agricultural activities located in the area.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

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Brian L. Gray

DB:vs:mp

988

XI - B15



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

P. O. Box 50006  
Honolulu, Hawaii  
96850

SEP 12 1981

105  
D. S. / Y. S.

Action:  
September 9, 1981

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 South King Street, Rm. 508  
Honolulu, HI 96813

Dear Mr. Gray:

Subject: Environmental Impact Statement Preparation Notice  
for the Proposed Kahaluu Industrial Project,  
TMK: 4-7-13: 01, 10, 11, 12, 16, 24

We have reviewed the subject proposal and offer the following comments  
for your consideration:

1. The flood channels shown as W-1, W-2, and NW in the Kahaluu Watershed Work Plan will not be constructed. Because of lack of community support and questionable economic justification, it was mutually agreed by the City and County of Honolulu, the Kahaluu Neighborhood Board, and the Soil Conservation Service that these flood control channels would not be constructed. This creates a situation where a portion of the proposed development may still be subject to flooding. The Soil Conservation Service has not conducted any studies to determine what the extent of flooding might be.
2. The "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii" shows that the predominant soils in the vicinity of the proposed development are Tropoquepts and Pearl Harbor clay. Both of these soil types have severe limitations for septic tanks and cesspools. We recommend that the EIS address the possibility of sewage effluent pollution of Kaneohe Bay from these alternatives.

Thank you for the opportunity to review this proposal.

Sincerely,

*Stratford L. Whiting*  
STRATFORD L. WHITING  
District Conservationist



The Soil Conservation Service  
is an agency of the  
Department of Agriculture

September 16, 1981

Mr. Stratford L. Whiting  
District Conservationist  
U. S. Department of Agriculture  
Soil Conservation Service  
P. O. Box 50006  
Honolulu, Hawaii 96850

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Whiting:

We have reviewed your letter of September 9, 1981 commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comments to your concerns:

1. The proposed project will require drainage improvements to comply with the City & County of Honolulu's Drainage Standards. The extent of the drainage improvements will be defined by a Drainage Report which must be submitted to the City & County of Honolulu Department of Public Works for review and approval. The Draft EIS will contain a preliminary drainage analysis which will address various drainage options and alternatives. Further, regardless of the fact that Soil Conservation Service has not conducted any flood studies of the area, a flood study must be prepared to establish the 100-year flood inundation elevation for the project site.
2. We are aware that the predominant soils in the vicinity of the proposed development are generally unsuitable for septic tanks and cesspools. These sewage disposal methods are not among the alternatives being considered.

We appreciate your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

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Brian L. Gray

DB:vs:mp

988

XI - B16

**KAHALUU NEIGHBORHOOD BOARD NO. 29**

c/o KAHALUU COMMUNITY CENTER

47 232 WAJHEE ROAD

KANELOHE, HAWAII 96744

(HEEIA KEA, KAHALUU, WAIHE'E, WAIHOLE, WAIKANE, HAKIPUU AND KUALOANUI)



Date: SEP 2 1981

To: 988

From: DB/NS

Action:  See Bill Dow Bush

"Let us not ever have

an unhappy minority!"

August 26, 1981

Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Proposed A & B Industrial Project  
Waihe'e, Ko'olaupoko, O'ahu, Hawai'i, TMK 4-7-13:1,10,11,12,16 & 24  
Preparation of Draft Environmental Impact Statement

Gentlemen:

This letter is our response to your request for written comments relating to the preparation of a Draft Environmental Impact Statement for the proposed Industrial Project at Waihe'e.

The Kahalu'u Neighborhood Board No. 29 has serious concerns regarding the many adverse impacts which the proposed development will have on the community and on the Environment.

Background

The proposed project site (see Exhibit I - 1981 Site Reference Map) was thoroughly studied by the Board's 1979 Kahalu'u Planning Task Force. The Task Force met twice with Alexander & Balwin's representative, Mr. Jim DeVine. Proposals by A & B, the Task Force and our Neighborhood Board will be discussed in other sections of this letter.

General Community Impact

The proposed development clearly would be an urban growth generator. The industrial aspect of the project would encourage additional commercial and residential development in the He'eia Kea to Kualoa community.

Encouragement of urban growth in this community is contrary to the 1977 City & County General Plan which establishes Objectives and Policies relating to the directions growth should take. The General Plan calls for stabilizing the proportion of O'ahu population in the Urban Fringe areas (i.e. 'Ahuimanu), reducing the proportion in Rural areas (i.e. Kahalu'u to Kualoa) and directing population growth to the Primary (Honolulu) and Secondary (Ewa) Urban Centers. The Development Plans, now under consideration by the City Council, reflect these Policies and Objectives on growth.

The Community (He'eia Kea, 'Ahuimanu, Kahalu'u, Waihe'e, Ka'alaea,

Prian L. Gray  
Gray, Hong & Associates, Inc.  
Proposed A & B Industrial Project  
Page 2

Waiahole, Waikane, Hakipu'u and Kualoa), through various community organizations from the 1960's and through the Kahalu'u Neighborhood Board since 1976, has developed a consensus and adopted Community Goals (see Exhibit II - Statement of Community Goals) which call for the development of diversified agriculture, maintenance of rural character and preservation of natural water and land resources. The detailed story of 12 years of the Community's planning efforts is contained in A Planned Community: Steps on the Journey - Kualoa to He'eia Community Initiative published by the Kahalu'u Neighborhood Board in 1980. A wealth of information also can be found in the 1975 Kahalu'u Watershed Final Environmental Impact Statement and the 1978 Kane'ohe Bay Urban Water Resources Study.

Therefore, how, being an urban growth generator (contrary to City & County Objectives and Policies and Community Goals), can the proposed development not have serious adverse impacts on the community's social fabric, agricultural development, natural resources protection, public services, land and tax costs and the overall quality of the environment? How will the community-wide environment and social costs be calculated?

Hawai'i Revised Statutes, Section 205 A-26 (relating to the SMA permit process) states: "No development shall be approved unless the authority has first found: (A) That the development will not have any substantial adverse environmental or ecological effect, except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health safety, or compelling public interest. Such adverse effects shall include, but not be limited to, the potential cumulative impacts of individual developments, each one of which taken in itself might not have a substantial adverse effect, and the elimination of planning options; . . .", emphasis added.

In addition to the proposed development under review, there are a number of major commercial and residential developments proposed or planned along Kam Highway or other various valley roads. Not only the individual but, more importantly, the cumulative adverse environmental and ecological impacts of these projects on our watersheds, agricultural lands and Kane'ohe Bay could be disastrous. Furthermore, various planning options would be eliminated and others severely restricted thus jeopardizing the achievement of Community Goals and the implementation of City and County Policies.

Therefore, how, considering the cumulative effect of individual developments and the loss of planning options, can the proposed development not have overwhelming adverse impacts on the community's environment and its ability to plan? How can the Community and the City & County achieve their Goals and Objectives?

Impacts on Community Services and Facilities Requirements:

The Industrial portion of the proposed development calls for 21 industrial lots on 13 acres of the 26 acre site. These industrial lots

Erian L. Gray  
Gray, Hong & Associates, Inc.  
Proposed A & B Industrial Project  
Page 3

would be located in a flood zone on fragile wetlands both mauka and makai of Kamehameha Highway (see Exhibit I - 1981 Site Reference Map and Exhibit III - 1977 Wetlands Survey). Aside from being an urban growth generator as previously discussed and encouraging strip industrial/commercial development along the highway, an industrial venture of this type and scale is not needed on our community. Regardless of the allegation of a shortage of industrial land on Windward O'ahu it would be completely inappropriate to develop industrial lands in a rural and agricultural area. At no time in discussions with our 1979 Task Force did A & B's Mr. LeVine ever suggest industrial use. The proposal is contrary to the requirements of the Community which call for existing and expanded social, civic, educational and recreational activities and future agriculturally oriented marketing facilities (see Exhibit II - Position on Community Services Center).

Therefore, how, by encouraging urban growth and introducing extensive industrial facilities, can the proposed development not have considerable adverse impacts on Community efforts to provide the services and facilities that it truly needs?

#### Impact on Community Recreational Requirements

The 5 acre makai portion of the proposed industrial development is a shoreline mangrove swamp in a flood zone. In 1979, A & B's Mr. LeVine stated to the Task Force that this parcel was mostly underwater and would require too many environmental considerations to be worth developing. He further stated that A & B had asked the City to purchase this parcel for possible park use but that the City had expressed no interest in buying. However, the Department of Parks and Recreation 1980 Community Based Recreation Plan for Ko'olaupoko now shows this property as an extension of the existing Shoreline Park adjacent to the Kahalu'u Channel. Because of the nature of the site, the Task Force and our Neighborhood Board have recommended Preservation for this area. However, Park use might be re-considered as an alternative. In any event, the proposed industrial use would be utterly devastating to this sensitive shoreline strip of land.

Therefore, how, by restricting public access to the shoreline, precluding the extension of a Shoreline Park and placing an inappropriate use in a fragile and sensitive wetland, can the proposed development not have adverse impacts on the shoreline access and recreational requirements of the Community and on the integrity of the shoreline itself?

#### Impact on Agricultural Lands

As previously discussed, the General Plan Objectives and Policies and our Community Goals are to encourage the development of a rural, agriculturally based community from He'eia Kea to Kualoa. There is a significant amount of Agricultural Land of Importance to the State of Hawai'i (ALISH) in our community (see Exhibit IV - 1981 Agricultural Resources Map) and their protection is of paramount importance. Because of the wetland

Brian L. Gray  
Gray, Hong & Associates, Inc.  
Proposed A & B Industrial Project  
Page 4

nature of the site the Task Force and our Neighborhood Board have recommended Preservation for the entire area. However the site has an ALISH classification of "Other Agricultural Lands of Importance" and Agriculture/Aquaculture use might be re-considered as an alternative. Even A & B's 1979 conceptual plan proposed to the Task Force suggested a considerable area along the Haiamoa Stream side of the site be devoted to Aquaculture.

Therefore, how, by encouraging urban growth and thereby exerting pressures to convert agricultural lands to urban uses, can the proposed development not have severe adverse impacts on the State of Hawai'i and Community efforts to retain lands in agriculture and to promote the development of diversified agriculture and aquaculture?

#### Impact on Community Housing Requirements

Residential development is proposed for approximately 12 acres of the 26 acre site. However, only 2-3 acres located at the mauka/Kane'ohē corner are at a level above the flood plain and wetlands. This area was filled and graded by A & B at considerable expense. Access is available from Waihe'e Road. Although our Neighborhood Board has recommended Preservation for the entire site, the 1979 Task Force had suggested that this limited area be used to meet the needs for low and moderate income housing for many community residents and the special housing needs for the elderly. This location was deemed particularly desirable because of its proximity to community services and facilities along Waihe'e Road. However the proposal before us does not indicate that any housing would be allocated to meet these needs.

Therefore, how, by catering to a general islandwide housing market, can the proposed development not have an adverse impact on Community efforts to encourage housing affordable by, or tailored to, the needs of its residents?

#### Impact of Water Resources

There is now a critical water resource problem on Windward O'ahu. Once plentiful, water resources are being developed at such a rapid rate that withdrawals and diversions for urban use have already dried up waterfalls and severely reduced flows in several important streams. This in turn effects diversified agriculture and the fragile ecology of our streams, wetlands, aquafarms, fishponds, shoreline and Kane'ohē Bay. Our Board has studied these water resource problems in depth (see Exhibit V - 1981 Water Resources Position Statement).

Thus, how, by being a major water user and by encouraging urban growth, can the proposed development not have drastic adverse impacts on stream flows, wetlands performance, agriculture and the ecology within our community?

#### Wetlands, Flood Hazard and Drainage Considerations



Brian L Gray  
Gray, Hong & Associates, Inc.  
Proposed A & B Industrial Project  
Page 5

Have the vital functions of the Waihe'e wetland been considered? This wetland, on both sides of Haiamoa Stream, acts in many ways to protect Kane'ohe Bay. It also serves as a habitat for endangered land birds and native Hawaiian plants. It should be emphasized that the U. S. Army Corps of Engineers cannot permit any fill in in a wetland unless such fill serves a purpose that is "wetland dependant".

Have flood hazard considerations been taken into account? Approximately 90% of the site is within the 50 year flood hazard zone. The existing wetland acts as a floodwater holding area and thus lessens the damage of severe floods on the surrounding area and Kane'ohe Bay.

Have the surface and storm drainage considerations been fully addressed? If the area were in wetland Agriculture or Aquaculture (as proposed by the Development Plans) the drainage into Kane'ohe Bay would be slow and "clean". Siltation would take place in the wetlands or aquaponds. Any earth particles of the lighter smaller type going into the Bay would be nutrient and not lethal. By contrast, the run-off from large paved and roofed surfaces through curbs, gutters and concrete drains would carry oil, grease and other hydrocarbons that would float out into the Bay and be quite lethal to marine life. This run-off would be rapid and precipitous and would carry much solid, non-biodegradable refuse along with it.

#### Sewage Disposal Considerations

Can sewage disposal problems be solved? Cesspools, septic tanks, aerobic units, injection wells, private treatment plants, etc. seem unacceptable due to soil impermeability and water table problems, public health hazards and contamination of Kane'ohe Bay. There are objections to a pump station and force main system because, again, a sewer line would generate conditions conducive to urbanization which is contrary to the General Plan and Community Goals. Although the Department of Public Works does have a Kahalu'u sewer system plan, this plan is designed and intended to serve only those areas which now have a high concentration of cesspools and a high cesspool failure rate.

#### Traffic Considerations

Would increased traffic cause unacceptable problems? The proposed industrial development would greatly increase traffic volume along portions of Kamehameha Highway. Our Board opposes encouraging development that eventually could require widening the highway from 2 lanes to 4 lanes.

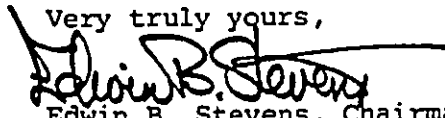
#### Summary and Conclusion

We have raised a number of the many questions which must be fully addressed in the Draft and Final Environmental Impact Statements for the proposed A & B Industrial and Residential Project at Waihe'e.

Brian L. Gray  
Gray, Hong & Associates, Inc.  
Proposed A & B Industrial Project  
Page 6

Not the least important of these questions deal with adverse impacts on our agricultural lands and water resources, adverse environmental or ecological effects of the potential cumulative impact of individual developments and the elimination of planning options.

Very truly yours,



Edwin B. Stevens, Chairman  
Kahalu'u Neighborhood Board No. 29

Copies: Ms. Robin Lee, Alexander & Baldwin, Inc.- Property Group  
U.S. Army Corps of Engineers  
Department of Land Utilization  
Department of Parks and Recreation  
Kahalu'u Neighborhood Board No. 29 - Chairman  
- Planning Committee  
- Resource Center

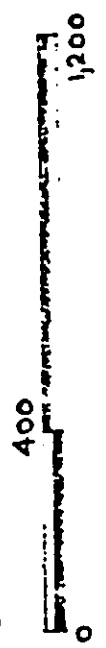
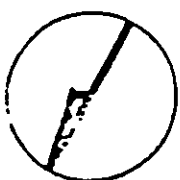
Neighborhood Commission

Exhibits: I Project Site Reference Map - N.B. No. 29 - 8/21/81  
II Statement of Community Goals & Position on Community Services  
Center - N.B. No. 29 - 1979  
III Wetlands and Wetland Vegetation of Hawai'i (Partial)-  
ACE - 1977  
IV Agricultural Resources Map - N.B. No 29 - 8/21/81  
V Water Resources Position Statement - N.B. No. 29 - 1981

References: General Plan, City and County of Honolulu - 1977  
A Planned Community: Steps on the Journey - Kualoa  
to He'eia Community Initiatives - Neighborhood Bd.  
No. 29 - 1980  
Kahalu'u Watershed, Final EIS - Soil Conservation Service - 1975  
Watershed Work Plan (Agreement) Kahalu'u Watershed - City  
and County of Honolulu, Windward O'ahu Soil and Water  
Conservation District, U.S. Soil Conservation Services - 1969  
Kane'ohe Bay Urban Water Resources Study - U.S. Army  
Corps of Engineers - 1978  
Kahalu'u Planning Task Force - Community Development Plan  
- Findings and Recommendations - Neighborhood Bd. No. 29 - 1979

KAHAE'U HEIGHT BOROUGH BOARD No. 29  
KUALOA TO HE'IEA

8-21-81



A H B PROPOSED INDUSTRIAL PROJECT  
AT WAIHE'E

SITE

PARK

LAGOON

SMA

WETLAND

HAIAMO'A  
STREAM

20'

WAIHE'E  
STREAM

KALOHA'  
STREAM

50 YEAR  
FLOOD

WAIHE'E  
ROAD

KAHALUU NEIGHBORHOOD BOARD NO. 29  
C O KAHALUU COMMUNITY CENTER  
47 232 WAIHEE ROAD  
KANEHOE, HAWAII 96744  
HEEIA KEA KAHALU'U WAIHE'E WAIANOLE WAIKANE HAKIPOU AND KUALOA



*"Let us not ever have  
an unhappy minority"*

Statement of Community Goals  
adopted by Neighborhood Board #29 at 8-22-79 and 9-12-79 meetings

The Windward area from Kualoa to He'eia (here-in-after referred to as Kahalu'u) is distinctively rural in character, possesses great scenic beauty and serves as a critical buffer zone at the very edge of Honolulu's urbanization. The goals of the Development Plan and this Ordinance shall insure that Kahalu'u a) Remains a community devoted to diversified agriculture and related activities; b) Preserves its ocean (Kaneohe Bay) and mountain (Ko'olau Range) beauty and its natural water and land resources; and c) Maintains its essential rural lifestyle. All efforts to preserve and develop the community's economic, natural and human resources shall be directed towards the accomplishment of these goals.

Position on Community Services Center  
adopted by Neighborhood Board #29 at 8-22-79 and 9-12-79 meetings

In order to establish a social and economic cohesiveness for rural Kahalu'u, provision should be made for a planned community service center located in the general vicinity of lower Waihe'e Road and the Flood Control Lagoon. This center will be the focal point for existing and expanding social, civic, educational and recreational activities and future agriculturally oriented marketing facilities. A District Park land acquisition program (already authorized by State and County resolutions and mandated by Federal/County contracts) should be carefully implemented and appropriate architectural controls should be applied to provide unifying design elements for this center.

WETLANDS AND  
WETLAND VEGETATION  
OF HAWAII

*by*  
Margaret E. Elliott  
and  
Erin Marie Hall  
*Geographers*

*prepared for*  
THE UNITED STATES ARMY CORPS OF ENGINEERS  
PACIFIC OCEAN DIVISION, FORT SHAFTER

Contract # DACW 84-77-C-0014

*submitted*  
SEPTEMBER, 1977

EARTHWATCH  
Environmental Resource Investigators

PREFACE

One of the most regrettable marks left by man on Hawaii's natural environment has been the destruction and alteration of wetlands. A "wetlands as wastelands" attitude, borne of a lack of knowledge about wetlands, has resulted in pollution, dumping, drainage, filling or paving over of many valuable resources. Oahu alone has suffered the loss of hundreds of acres of wetlands, including vast marshlands which spanned much of the coastal area between what is now Hickam Air Base and Waikiki. Areas of Kuapa Pond, Salt Lake, Kaelepu Pond and Mokapu Peninsula offer further testimony to the destructive management practices often applied to wetlands.

In recent years, environmental concern has stimulated an increased awareness of the significance of wetlands. Though it is too late to save nearly half of the country's original wetlands, preservation and awareness programs are being developed by national and state agencies. The Corps of Engineers, under Section 404 of the Water Pollution Control Act of 1972, has been given the authority to regulate the discharge of fill or dredged material into the nation's coastal and inland waters and wetlands. The following report was prepared to assist in the implementation of the Corps permit program in Hawaii. It includes (1) a descriptive inventory of wetlands found throughout the state; (2) maps showing their location, extent and boundaries; (3) lists of plant species found in each wetland area; and (4) a field guide to the most important wetland plant species. It is hoped that these may serve as a guide to anyone who wishes to recognize the Hawaiian wetland environment, and especially to those interested in resource planning, management, education or research.

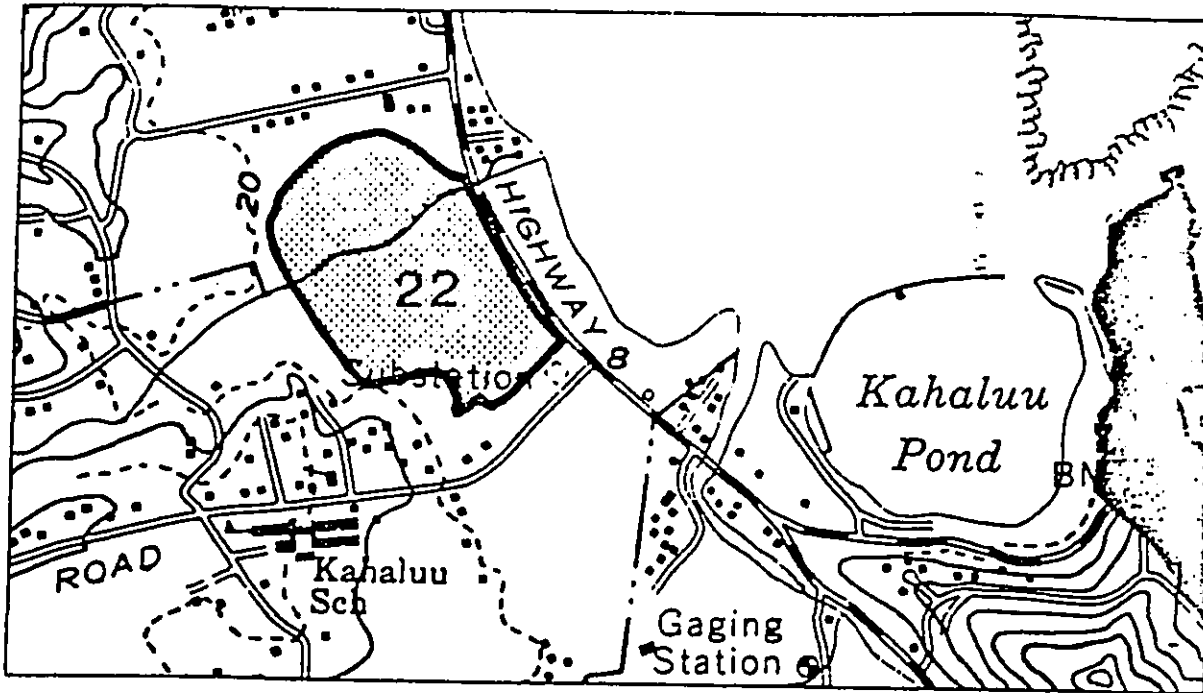
Portions of this report are included in the thesis of Margaret E. Elliott, graduate student at the University of Hawaii. The thesis is being submitted to the Graduate Division in partial fulfillment of the requirements for a Master of Arts Degree in Geography.

Site 22. WAIHEE

The lowlands of windward Oahu around Kaneohe Bay receive abundant rainfall (75 to 100 in per year) as well as water from dike-confined springs and upland streams. These conditions are favorable for agriculture, and history indicates that great numbers of ancient Hawaiians once lived and farmed in the valleys and coastal lands of Kaneohe. For centuries the region supported acres of wetland taro and later rice, sugar cane, pasture and pineapple. Marshlands were often included in the hundreds of acres devoted to these crops. Today, urban development has altered much of the culture and landscape. Only a few large farms remain. The marshes, formed by natural conditions or by old irrigation operations, remain scattered in small numbers along the windward section of Oahu. The wetland at Waihee is one example of these marshes. It is located in the Waihee district approximately one mile northeast of Kahaluu (Map 23).

This freshwater marsh lies adjacent to Kamehameha Highway. It is separated from the road by a small embankment covered with weedy vegetation including Leucaena leucocephala shrubs. A small power substation is situated on its southern border. Low grasses and Amaranthus spinosus in dry soil grade into Scirpus validus and Brachiaria mutica in waterlogged soil, marking the boundary on the southern side. The interior of the marsh is dominated by a dense stand of Brachiaria mutica, with occasional patches of Sagittaria sagittaeifolia and Ludwigia octovalvis (PLATE 19). Underlying soil is mucky, with 1 to 2 ft of standing water. This level of flooding varies seasonally.

A small stream feeds into the marsh from the west, becomes undefined in the matted vegetation, and finally empties into the ocean to the east. A patch of Typha angustata and Scirpus validus occupies the corner of the marsh north of this small stream. Table 22 lists plant species found within the boundaries of this wetland. The marsh is presently surrounded by homes, and with urban development rapidly increasing on the windward coast, this wetland area may be threatened in the future.



Map 23. Waihee Marsh (Kaneohe Quadrangle).  
Scale = 1:12,000



Site 22. Waihee Marsh: Sagittaria sagittaeifolia, Ludwigia octovalvis and Brachiaria mutica within the marsh.



Table 22. SPECIES LIST FOR WAIHEE, OAHU (Site 22)

		Cover	Abundance
MONOCOTYLEDONAE			
ALISMATACEAE			
** <u>Sagittaria sagittaeifolia</u>	Arrowhead	1	O
COMMELINACEAE			
* <u>Commelina diffusa</u>	Honohono	2	A
CYPERACEAE			
** <u>Scirpus validus</u>	Great bulrush	2	A
GRAMINEAE			
* <u>Brachiaria mutica</u>	California grass	4	V
TYPHACEAE			
** <u>Typha angustata</u>	Cattail	1	O
DICOTYLEDONAE			
COMPOSITAE			
* <u>Pluchea indica</u>	Indian pluchea	1	R
* <u>Pluchea odorata</u>	Pluchea	1	R
LEGUMINOSAE			
<u>Canavalia cathartica</u>	Mauna-loa	1	R
<u>Mimosa pudica</u>	Sensitive plant	1	R
MALVACEAE			
* <u>Hibiscus tiliaceus</u>	Hau	1	R
MYRTACEAE			
<u>Eugenia cumini</u>	Java plum	1	R
ONAGRACEAE			
** <u>Ludwigia octovalvis</u>	Kamole	2	F
RUBIACEAE			
<u>Paederia foetida</u>	Maile pilau	1	O

\*\* Obligate species

\* Facultative species

1 = <5% cover; 2 = 5-25%; 3 = 26-50%; 4 = 51-75%; 5 = 76-100%

R = Rare; O = Occasional. F = Frequent; A = Abundant; V = Very abundant

KAHALUU NEIGHBORHOOD BOARD NO. 29  
c/o KAHALUU COMMUNITY CENTER  
47 232 WAIHEE ROAD  
KANEONE, HAWAII 96744  
IHEE-A HEA KAHALUU WAIHEE WAIKOLE WAIKANE HAKIPUU AND KUALOAI



"Let us not ever have  
an unhappy minority"

March 23, 1981

Honorable Eileen Anderson, Mayor  
City and County of Honolulu  
City Hall  
Honolulu, HI 96813

Subject: Water Resources Position Statement

Dear Mayor Anderson:

For many years the Kahalu'u community has become increasingly concerned over the approaching crisis situation in water resource management. To address this concern, Kahalu'u Neighborhood Board No. 29 has prepared and adopted the attached Water Resource Position Statement.

The first recommendation is made to conform with the intent of the Constitutional Convention to eliminate conflicting policies and directions in water resource management:

"That the State of Hawaii and the City and County of Honolulu, in cooperation with each other, establish an independent Oahu Water Authority which shall have jurisdiction over the management of all perched, dike impounded, and basal ground waters and all stream, sheet flow and ponded surface waters on the island of Oahu."

The other and equally important recommendations are made to implement an action program to correct immediate and prevent future problems brought about by water development and diversion.

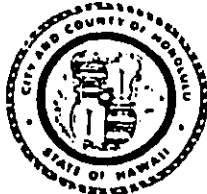
We are forwarding this Position Statement with the hope that the background information and specific recommendations will enable you to assist us in solving our very real water resource problems.

Very truly yours,

  
Elwin Spray, Chairman  
Neighborhood Board No. 29

cc: George Aryoshi, Governor, State of Hawaii  
Richard Wong, President, Hawaii State Senate  
Henry Peters, Speaker, Hawaii State House of Representatives  
Rudy Pacarro, Chairman, Honolulu City Council

KAHALUU NEIGHBORHOOD BOARD NO. 29  
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HE'EIA KEA KAHALUU, WAIHE'E WAIAMOLE WAIKANE, MAKIPUU AND KUALOA



"Let us not ever have  
an unhappy minority"

WATER RESOURCES POSITION STATEMENT  
March 11, 1981

The Kahalu'u Neighborhood Board No. 29, which represents 8 Ahupua'a from Kualoa to He'eia, is seriously concerned about the availability to water for agriculture, aquaculture and stream and bay resources in this rural community and other communities along the entire windward coast.

For over 10 years the community has worked together to plan its future. The story of this effort is reported in A Planned Community: Steps on the Journey - Summary of Kualoa to He'eia Community Initiatives published by the Board in July, 1980. In September, 1979 the Board adopted the following Community Goals:

"The windward area from Kualoa to He'eia is distinctively rural in character, possesses great scenic beauty and serves as a critical buffer zone at the very edge of Honolulu's urbanization. The goals of the Development Plan shall insure that Kahalu'u:

- a) remains a community devoted to diversified agriculture and related activities.
- b) preserves its ocean (Kane'one Bay) and mountain (Ko'olau Range) beauty and its natural water and land resources.
- c) maintains its essentially rural life-style.

All efforts to preserve and develop the community's economic, natural and human resources shall be directed toward the accomplishment of these goals."

During the past 2 years the community and the Board have concentrated their attention on the preparation of proposed City and County Development Plans which will reinforce these goals.

Because of the importance of diversified agriculture and stream and bay resources to the future of this and other windward communities, the Board feels compelled to adopt this Water Policy and Resource Position Statement.

Importance of Water for Non-Urban Use

An adequate quantity and quality of fresh water is essential for diversified agriculture, taro farming, stream fishing and aquaculture. The proper quality of

of brackish water is required for fishponds, limu harvesting, bay fish breeding grounds and mariculture. Adequate quantity, quality and flow of water is essential for maintenance of the ecology of streams, wetlands, the shoreline and Kane'ohē Bay.

#### Importance of Non-Urban Lands

Agricultural lands are of vital importance to O'ahu. They provide a satisfying livelihood and lifestyle for many and as a source of food production they are now important, but will become essential as the need for island food and energy self-sufficiency increases. Agricultural lands together with conservation and other non-urban lands provide the considerable open space required for a high density island population, the vast areas required for watershed protection and the mountain, stream and shoreline areas required for outdoor recreation. Most of this non-urban land could not survive in a useful condition without an ample quantity of quality fresh water.

#### Water Development and Diversions

There is a history of developing water on the windward side and diverting it to other parts of the island. For many years the private Waiahole ditch and tunnel system has collected and diverted water to central O'ahu sugar lands currently at the rate of 25 mgd. More recently the Board of Water Supply has developed windward water which it increasingly diverts to urban Honolulu. By the year 2000 the Board of Water Supply estimates that it will produce windward water at the rate of 43 mgd of which it intends to transport 21 mgd to urban Honolulu.

Even now, the Board of Water Supply water development in the He'eia, Kahalu'u, and Waihe'e watersheds has had serious adverse effects on stream flow. Planned water development would extend these adverse effects up and down the windward coast. Furthermore, water development in a particular watershed may reduce availability in other watersheds. For example, the Haiku Tunnel in He'eia has contributed dramatically to the reduction of Kahalu'u Stream flow. (see Exhibit I)

#### Water Rights

Board of Water Supply water development has already required Waihe'e farmers to go to court to protect their traditional and constitutional reparalan and appurtenant rights to water. Additional development and diversion may well send many others to court.

#### Previous Board Positions and Statements

Since its inception the Board has consistently spoken out for a sensible water policy. A few examples follow:

Position on Water (9-25-77)—A comprehensive statement of concerns and proposals excerpt: "... that no growth or development be permitted on O'ahu until it is proven beyond a reasonable doubt that the potable freshwater resource of this island be not exceeded by a margin wide enough to assure fulfilment of the policy of the State of Hawaii to preserve and promote agriculture towards a large measure of self-sufficiency than we now have..."

Position Paper on the Waihe'e Watershed (5-10-78) - a thorough review of problems and a proposal for interim development controls or special design

district and comprehensive watershed development plan.

Monitoring Stream Flows (11-3-80) to DLNR-discusses concern over reduction of stream flows essential to agriculture and requests flow monitoring-excerpts: "...windward water resource development consists principally of tunnels for impounded high level dike water and deep wells for underlying basal water... both types of development reduce stream flow by diversion of draw down...it is important that data be collected prior to construction of any additional test or production facilities...all streams on the windward side must be monitored because the hydrologic relationships between watersheds, dike complexes and basal waters have not been determined..."

Comments on Kahalu'u Well EIS (11-7-80) to BWS - discusses inadequacies, inaccuracies, and misrepresentations in the EIS - discusses probable stream flow reduction and subsequent effects.

Environmental Impact Assessments of Negative Declarations for a number of proposed test wells (2-14-81) to BWS and DLNR - excerpts: "...concerned over the apparent casualness with which exploratory wells are transposed into production facilities...an exploratory well with a bore size much less than that of a production well would be more in keeping with a negative declaration ...Board recommends bore reduction for exploratory wells or else an EIS.

Hui Malama Aina 'O Ko'olau - Water Policy Statement (8-22-80) - endorsement by the Board of Hui Malama's six policy statements.

#### Water Policy Statements

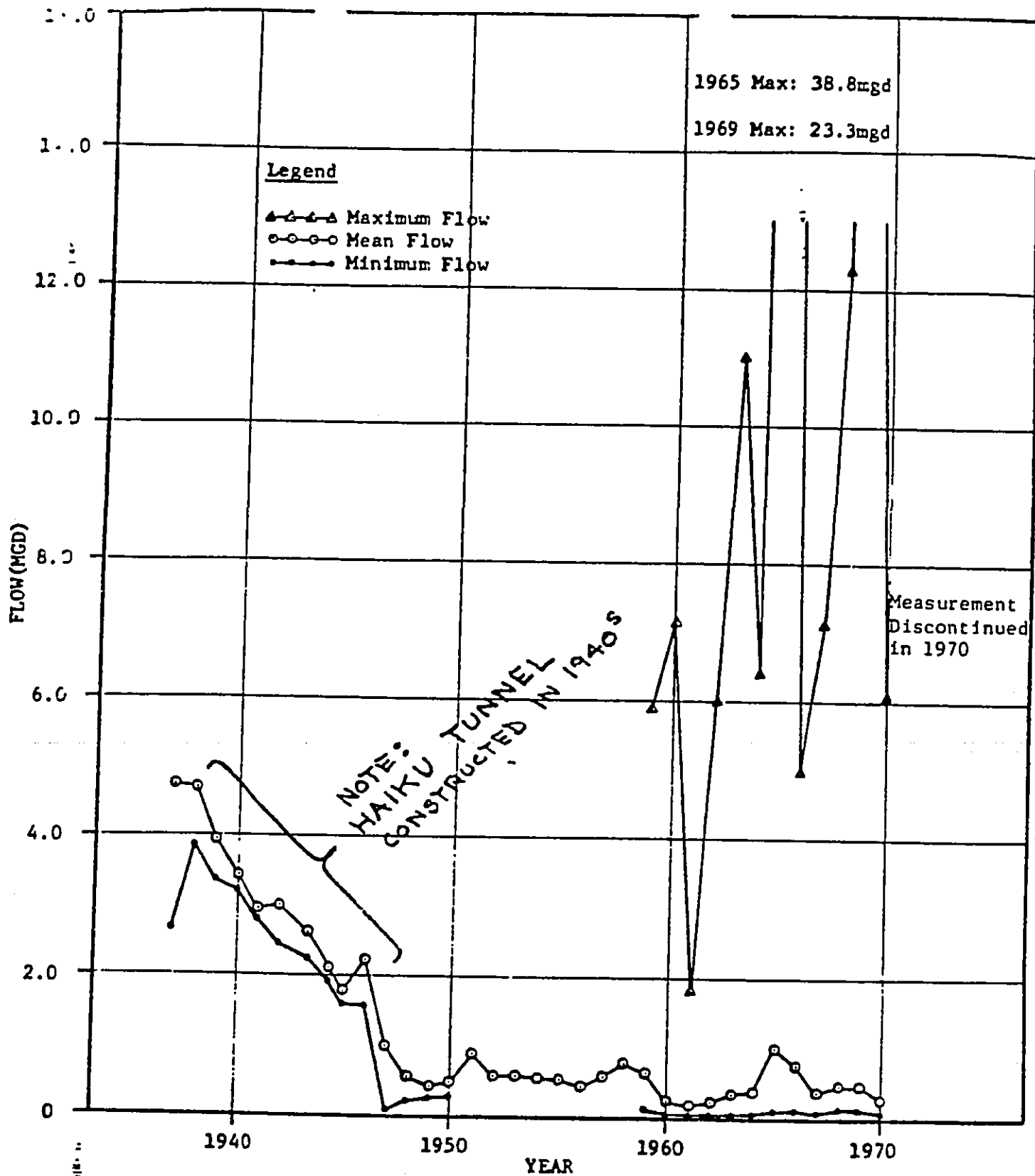
The Kahalu'u Neighborhood Board No. 29 advises and recommends that:

1. The State of Hawai'i and City and County of Honolulu, in cooperation with each other, establish an independent O'AHU WATER AUTHORITY which shall have jurisdiction over the management of all perched, dike impounded & basal ground waters and all stream, sheet flow & ponded surface waters on the island of O'ahu
2. the Department of Land and Natural Resources immediately establish interim stream flow standards for all windward streams.
3. development of any additional windward water resources be limited by interim or permanent stream flow standards and be reserved first for windward agricultural use and next for windward suburban use.
4. a moratorium be established on any additional diversion of windward water outside Ko'olopoko & Ko'olauloa until establishment of permanent stream flow standards that will assure fulfillment of the policy of the State of Hawai'i to achieve ever increasing agricultural self-sufficiency
5. no water be taken from present agricultural users and that the appurtenant and riparian rights of water users be protected and defended to the fullest extent.

6. the Department of Land and Natural Resources immediately commence monitoring in-stream flows of all windward streams - gauging stations to be installed at appropriate strategic locations along each stream.
7. the Department of Land and Natural Resources initiate a comprehensive study of all windward water resources encompassing the sources and amounts of impounded high level dike water, underlying basal water, ground water, in-stream water, surface run-off & ground recharge and the hydrologic relationships of the various types of water resources and their further inter-relationships with watersheds, shoreline and Kane'ohe Bay.
8. water for urban growth be developed from conservation measures, re-use and desalinization.

Exhibit I - Stream Flow Data, Kahalu'u Stream  
Exhibit II - Typical Hydrological Cross Section of Windward Ko'olau Range  
Exhibit III - Description of Ahupua'a in Neighborhood Board No. 29 District  
Exhibit IV - Water Resources Map for Neighborhood Board No. 29 District.

Water Resources Position Statement  
approved unanimously (For-9, Opposed-0, Absent-5)  
Kahalu'u Neighborhood Board No. 29  
at Regular Meeting of March 11, 1981



GAGING STATION: 16283000  
 LOCATION: KAHALUU STREAM NEAR HEEEA

Source: "Water Resources Data for Hawaii and Other Pacific Areas"  
 U.S. Geological Survey

FIGURE 8

STREAMFLOW DATA

KAHAWU NEIGHBORHOOD BOARD # 29  
 WATER RESOURCES POSITION STATEMENT

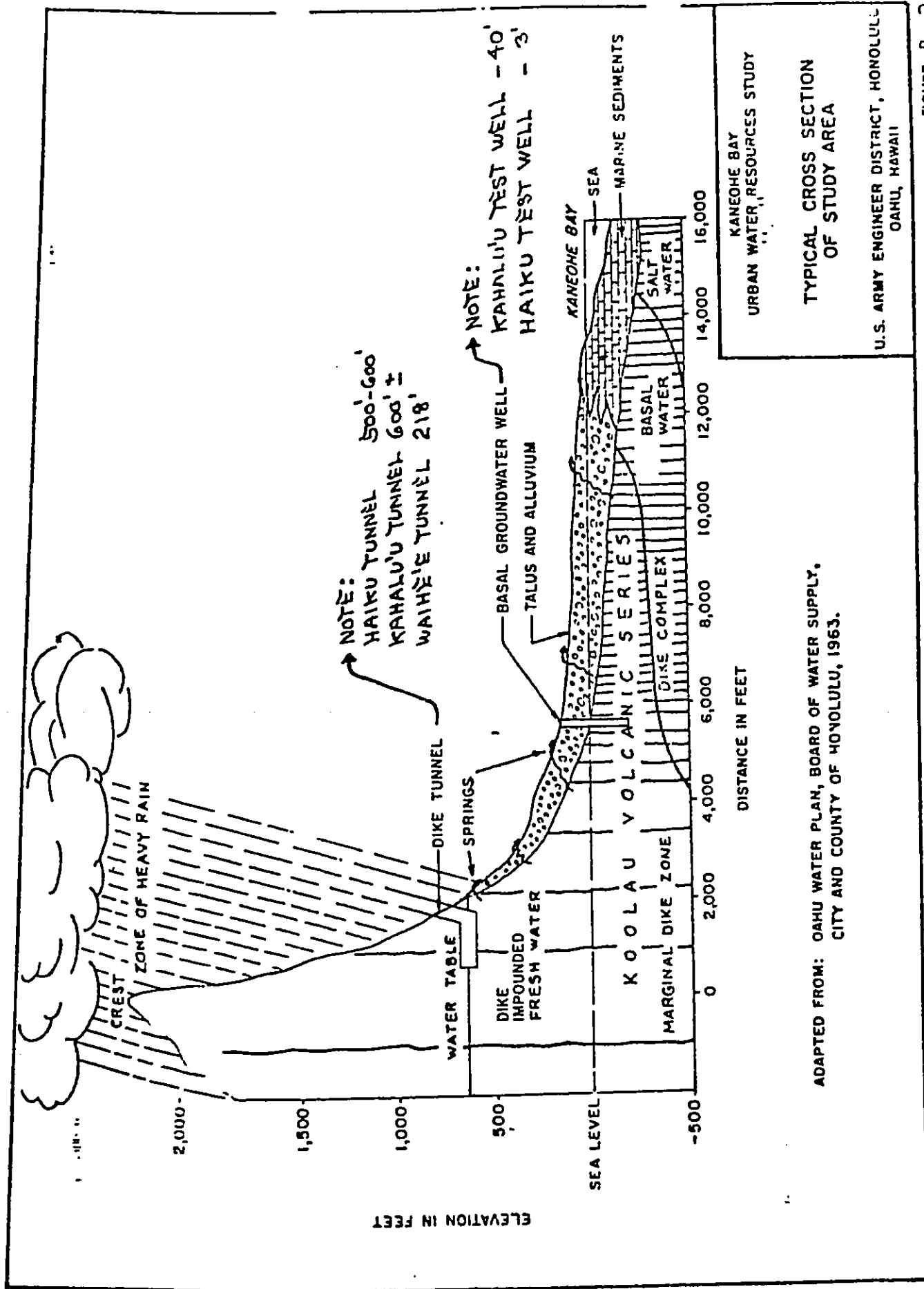


FIGURE B-2

FIGURE B-2  
 KAHALU'U NEIGHBORHOOD BOARD #29  
 WATER RESOURCES POSITION STATEMENT  
 EXHIBIT II





"Let us not ever have  
an unhappy minority"

Water Resource Position Statement  
Exhibit III-Ahupua'a Descriptions

Ahupua'a of Kualoa

Agricultural and Recreational-no streams

Ahupua'a of Hakipu'u

Agricultural and Rural

- Hakipu'u Stream-flows through agricultural lands and historic taro lo'i to Kane'ohē Bay.

Board of Water Supply water development: proposed deep wells-estimated production, .50 mgd. basal water.

Note: stream flow essential to existing aquaculture development at entrance to bay.

Ahupua'a of Waikane

Agricultural and Rural

- Waikane Stream-flows through agricultural lands to wetland and Kane'ohē Bay.

Board of Water Supply water development: proposed deep wells-estimated production, .50 mgd basal water (see note 1)

Private water development: (see note 2)

- Waikē'e Stream'-flows through agricultural lands-major tributary to Waikane Stream.

Board of Water Supply water development: proposed deep wells-estimated production .50 mgd basal water (see note 1)

Private water development: (see note 2)

Ahupua'a of Waiahole

Agricultural and Rural

- 'Uwao Stream-flows through agricultural lands-tributary to Waianae Stream

Board of Water Supply water development: none.

Private water development: (see note 2).

- Waianu Stream-flows through agricultural lands-major tributary to Waiahole Stream.  
Board of Water Supply water development: proposed deep wells-estimated production, .50 mgd basal water (see note 1).  
Private water development (see note 2).
- Waiahole Stream-flows through agricultural lands to wetland and Kane'ohē Bay.  
Board of Water Supply water development: proposed deep wells, estimated production, .50 mgd basal water (see note 1).  
Private water development: (see note 2).

Ahupua'a of Ka'alaea

Mostly Agricultural and Rural-some suburban

- Ka'alaea Stream-flows through agricultural lands to wetland and Kane'ohē Bay.  
Board of Water Supply water development: none.

Ahupua'a of Waihe'e

Mostly Agricultural and Rural-some suburban-parks, school, public and community facilities.

- Haiamoa (North Waihe'e) Stream-minor stream in agricultural area-flows to wetland and Kane'ohē Bay.  
Board of Water Supply water development: none.
- Waihe'e Stream-flows through agricultural land to flood control lagoon and Kane'ohē Bay.  
Board of Water Supply water development: existing high level tunnel-1979 production 5.54 mgd dike water-existing inclined wells-1979 production .77 mgd dike water-existing high level wells-1979 production not published (see note).  
Note: Water development has so reduced stream flow that a court order will not allow diversions to reduce stream flow below 2.70 mgd-this, however, is not an adequate flow to sustain extensive taro production downstream.
- Hamama Stream-Waihe'e tributary above water development.
- Kalia Stream-Waihe'e tributary below water development.

Ahupua'a of Kahalu'u

Partly Suburbanized-single family houses, townhouses, strip commercial area.

- Kalohaka Stream-minor stream in agricultural area-flows to Waihe'e Stream near flood control lagoon.

Board of Water Supply water development: none.

- Kahalu'u Stream-agriculture on Waihe'e side-houses crowding He'eia side may require channelizing lower portion-flows to channel and flood control lagoon.

Board of Water Supply water development: existing high level tunnel-1979 production, 1.89 mgd dike water-existing deep test well-estimated production-.50 mgd basal water (but may be nearer 1.5 mgd).

Note: tunnel diversion has contributed toward reduced stream flow.  
(see Exhibit I).

Ahupua'a of He'eia ('Ahuimanu and He'eia Kea portions)

Partly suburbanized-single family houses, townhouses, shopping center and cemetery.

- 'Ahuimanu Stream-planned residential will protect upper part of stream (see note)-housing development has caused channelizing of lower part-flows to channel and flood control and Kane'ohe Bay.

Board of Water Supply water development: none.

Note: planned residential on upper stream may develop private water production-developer to donate historic Kahalu'u Taro Lo'i site.

- Waiola Stream-upper part protected by cemetery-lower part channelized to handle increased pavement and roof run-off-flows to channel and flood control lagoon and Kane'ohe Bay.

Board of Water Supply water development: none.

Note 1 Total estimated Board of Water Supply production for Waiahole and Waikane wells is 2.00 mgd-so, .5 mgd is allocated to each of four streams: Waikane, Waikane'e, Waiano and Waiahole.

Note 2 Private development includes extensive Waiahole ditch and tunnel system which collects 25 mgd of dike water from Kahana, Waikane and Waiahole and diverts it to central O'ahu Sugar lands.

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

October 26, 1981

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE

Mr. Edwin B. Stevens, Chairman  
Kahaluu Neighborhood Board No. 29  
c/o Kahaluu Community Center  
47-232 Waihee Road  
Kaneohe, Hawaii 96744

SUBJECT: Proposed EIS  
Kahaluu Industrial Project

Dear Mr. Stevens:

We thank you for your extensive consultation comments regarding the subject Environmental Impact Statement preparation. As a general preface for our response, we notice that a majority of your comments are related to planning and implementation of planning. The EIS being prepared discusses the relationship of the proposed project to land use plans, policies and controls. We believe you are aware that the existing planning and zoning controls are compatible with the proposed action. However, it is recognized that there are proposed changes to land use planning policies. The EIS will discuss the proposed changes.

The EIS will discuss the proposed project in relationship to State Land Use, the Hawaii State Plan, Zoning, the General Plan, the proposed Development Plan and the Hawaii Coastal Zone Management Program.

With respect to the remainder of your comments, we are providing the following information which will be incorporated into the EIS.

IMPACT OF COMMUNITY SERVICES AND FACILITIES REQUIREMENTS

While it is correct that the proposed project is presently within a flood prone area and also within the wetland, proposed improvements will provide adequate drainage. Further, consultants have prepared studies of the wetlands which do not support the contention that the wetlands are prohibitively fragile or that drainage improvements will cause unacceptable danger to public health and safety or water quality.

It is recognized that the Kahaluu Neighborhood Board prefers a rural and agricultural setting for the site. One of the findings presented in the EIS will be the Kahaluu Neighborhood Board's opposition to the project.

IMPACT ON COMMUNITY RECREATIONAL REQUIREMENTS

The proposed project will provide lands as required by the Shoreline Access Rules and Regulations, Shoreline Setback requirements and park dedication requirements. The impacts on the environment will be analyzed in the EIS, however, it is not anticipated that the impacts will be "utterly devastating" as stated in your letter. There will be impacts affecting water quality and aesthetics.

Mr. Edwin B. Stevens, Chairman  
Kahaluu Neighborhood Board No. 29  
October 26, 1981  
Page Two

We recognize that you desire that park use of the makai property. However, if lands are required in excess of shoreline access regulations, shoreline setback requirements and park dedication requirements, it is believed appropriate proceedings such as condemnation should be initiated to obtain the lands.

#### IMPACT ON AGRICULTURE

The project site contains soil only suitable for taro, watercress and rice. The economic viability of these crops from even an optimistic point of view is questionable. From the standpoint of the environment, any agricultural development of the project will have similar adverse affects on water quality as will urban development. This statement is predicated upon the fact that any development (urban or agricultural) must utilize drainage improvements to channelize stormwater around the development area.

#### IMPACT ON HOUSING REQUIREMENTS

The method of sewage treatment and disposal for the project will control whether or not houselots are created. If houselots are created and the lots are sold without homes, then the type of home constructed will be determined by the lot owner and the building code requirements. The economic viability will be determined by each lot owner. This approach is well suited to your concern for moderate income housing.

#### IMPACT ON WATER RESOURCES

As discussed in the EIS, it is generally agreed that there are additional groundwater sources within Windward Oahu. However, the Board of Water Supply will have the ultimate decision as to whether adequate sources are available or can be developed to serve the project. If water resources cannot be developed to support the project, the project would be revised or terminated.

#### WETLANDS, FLOOD HAZARD AND DRAINAGE CONSIDERATIONS

The EIS contains specific appendices to discuss fauna, flora, drainage and water quality. The project site has been studied with respect to City & County Drainage Standards and Federal Flood Insurance requirements. The site will have to be filled and a channel must be created along North Waihee Stream (Haia-moa Stream). The results of all studies recognize your concerns, however, it does not appear that any of your concerns are of a magnitude to prohibit the project. Various governmental agency reviews and approvals will be the ultimate assurance that the project's impacts are not prohibitively adverse.

The proposed project qualifies for a "nation-wide" Department of the Army permit due to the small stream flow of North Waihee Stream. The small stream flow and relatively small drainage basin imply that the magnitude of environmental damage will be limited. The Corps of Engineers, however, can invoke discretionary powers and require a specific Department of the Army permit if it is determined that the project site is a "Special Aquatic Site" with considerable value. The information available does not indicate the site is of significant value in this respect.

Mr. Edwin B. Stevens, Chairman  
Kahaluu Neighborhood Board No. 29  
October 26, 1981  
Page Three

SEWAGE DISPOSAL CONSIDERATIONS

The EIS discusses two (2) proposed methods of sewage disposal. The methods are a force main connected to the Ahuimanu STP and on-site treatment with treated effluent being reused for irrigation of agriculture. Cesspool use is not proposed for the site.


TRAFFIC CONSIDERATIONS

The EIS will discuss traffic considerations. It is recognized that improvements to Kamehameha Highway must be incorporated within the project that satisfy the State Department of Transportation. It is anticipated that the improvements may require acceleration and deceleration lanes and left-turn storage lanes. However, it appears your concerns for traffic considerations oppose any improvements that may potentially allow growth in the area. This consideration is made a part of the EIS.

We look forward to your review of the forthcoming EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

  
Brian L. Gray

DB:mp

988

XI-B17

HUI MALAMA AINA O 'KOOLAU

October 2, 1981

ALL LIST 01381  
Date Received 966  
File: DB/Via  
Action:

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Re: Proposed A & B Industrial Project  
Waihe'e, Koolaupoko, Oahu, Hawaii  
Tax Map Key Number: 4-7-13: 01, 10, 11, 12, 16 and 24

Dear Mr. Gray:

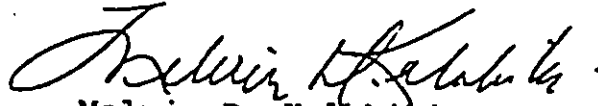
I am responding to your request for comments by letter dated September 4, 1981 regarding the above-referenced project. HUI MALAMA AINA O KO'OLAU has reviewed the comments submitted to you by Kahaluu Neighborhood No. 29 dated August 26, 1981 and concurs completely in the excellent analysis made by that body. Therefore, we incorporate the Kahaluu Neighborhood Board comments by reference as though fully set forth herein in their entirety.

As a further comment, we point out that the environmental impacts of this project will unquestionably be significant. Thus, under the Hawaii Coastal Zone Management Act, H.R.S. § 205A-26, a Special Management Area Use Permit could not be granted unless the adverse environmental effects are shown to be "clearly outweighed" by "compelling public interest." We believe that the public interest clearly weighs against the introduction of industrial uses into this rural community.

Finally, this project is inconsistent with the objectives, policies and guidelines of the Coastal Zone Management Act and is inconsistent with the Honolulu General Plan so that a Special Management Area Use Permit could not lawfully be granted.

Please do not hesitate to contact HUI MALAMA AINA O KO'OLAU should you have any further questions or should you desire to discuss uses of the property which would be compatible with the Waihe'e community character.

Sincerely,

  
Melvin D. Kalahiki, President  
HUI MALAMA AINA O KO'OLAU  
45-324 Koa Kahiko Street  
Kaneohe, Hawaii 96744

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

October 23, 1981

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE

Mr. Melvin D. Kalahiki, President  
Hui Malama Aina O Ko'olau  
45-324 Koa Kahiko Street  
Kaneohe, Hawaii 96744

SUBJECT: EIS Preparation Notice for the  
Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Kalahiki:

We have reviewed your letter of October 2, 1981, commenting on the above mentioned EIS Preparation Notice. We would like to provide the following comment to your concerns:

1. Enclosed is a copy of our response to the Kahaluu Neighborhood Board consultation comments .
2. In compliance with the Hawaii Coastal Zone Management Act, HRS 205A-26, an accepted EIS, which addresses the significance of the proposed project within the SMA will be submitted concurrently with the SMA application. The accepting agency for this EIS is the Department of Land Utilization. This agency will determine if the environmental impacts have been adequately analyzed and if the impacts will be significant. We believe that the development does not present any substantial and prohibitive adverse effects, except those that are minimized to the extent practicable.
3. A discussion of relevant objectives and policies of the Hawaii Coastal Zone Management Program and the City and County of Honolulu General Plan will be incorporated into the EIS. In summary, the project is not inconsistent with the objectives and policies of these land use plans for the affected area.

Thank you for your review and comments on this EIS Preparation Notice.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

  
Brian L. Gray

DB:vs:mp

Enclosure: (1)

988



B. SUMMARY OF UNRESOLVED ISSUES

1. No commitment of potable water has been made by the Board of Water Supply. However, this is not unusual as their determination on the availability of water is dependent upon the status of the water supply when water master plans are submitted for their review and approval. In the event that it is determined that adequate water is not available, this will be significantly adverse to curtail and foreclose the proposed project.

2. The exact method of sewage treatment has to be resolved prior to approval of a Special Management Area Use Permit (SMP). The method of sewage disposal will be designed according to applicable City and State standards. Dependent on the issue of sewage disposal is the proposed use of the residentially zoned portions of the site. However, the possible alternatives of creation of either an agricultural lot or residential subdivision were addressed throughout this EIS.

3. The Kahaluu Neighborhood Board and the organization, Hui Malama Aina O'Koolau, have expressed opposition to the proposed action. While attempts were made to resolve the issues that are of concern to them (written responses to their respective consultation comments), unfortunately it is felt that these organizations will not alter their position on the proposed action.

4. While the Department of Parks and Recreation, City and County of Honolulu has no objection to the proposed project in general, they feel it would be more beneficial if the makai portion of the project was left as open space. However, it is the belief of Alexander & Baldwin, Inc. that additional lands for the purpose of extending Kahaluu Beach Park should be acquired by other methods, i.e., condemnation.

XII. LIST OF NECESSARY APPROVALS

A. FEDERAL GOVERNMENT

1. Corps of Engineers, Department of the Army Permit

B. STATE OF HAWAII

1. Department of Health - Noise Permit, Construction Plan Approval
2. Department of Land and Natural Resources - Conservation District Use Permit

C. CITY AND COUNTY OF HONOLULU

1. Department of Land Utilization - Shoreline Management Area Use Permit, Construction Plan approval, Subdivision Approval (for consolidation)
2. Department of Public Works, Engineering Division - Grading Permit, Construction Plan Approval
3. Department of Transportation, Traffic Engineering - Construction Plan Approval
4. Department of Public Works, Division of Wastewater Management - Construction Plan Approval
5. Board of Water Supply - Construction Plan Approval
6. Fire Department - Construction Plan Approval
7. Department of Parks and Recreation - Construction Plan Approval

D. PRIVATE

1. Hawaiian Electric Company - Construction Plan Approval
2. Hawaiian Telephone Company - Construction Plan Approval

XIII. ORGANIZATIONS AND PERSONS INVOLVED IN THE PUBLIC REVIEW PERIOD

Included within this section are all comments received during the thirty (30) day review period as well as the responses to those comments.

The review comments have resulted in changes to the text of the Draft EIS. In addition to typographical corrections, the following more significant contextual changes have been made:

1. Identification of Waihee Marsh and coastal wetlands.
2. Quantification of earthwork quantities.
3. Summarization of drainage alternatives within text.
4. Revision of Development Plan status.
5. Addition of coastal wetland discussion.
6. Expansion of discussion on noise impacts and methods of control.
7. Expansion of viewplane impacts and methods of control.
8. Addition of Agricultural Feasibility Study.

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET  
HONOLULU, HAWAII 96813  
PHONE 523-4161

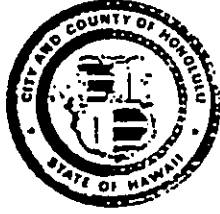
Date Rec **DEC 4 1981**

File: \_\_\_\_\_

To: **DB**

Action: \_\_\_\_\_

EILEEN R. ANDERSON  
MAYOR



JOSEPH K. CONANT  
DIRECTOR

CHARLES K. TORIGOE  
DEPUTY DIRECTOR

December 2, 1981

Mr. David Bills  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Subject: Draft Environmental Impact Statement (EIS)  
Proposed Kahaluu Industrial Development  
Tax Map Key: 4-7-13: 1, 10, 11, 12, 16, 24

Thank you for forwarding the subject draft EIS for our review and comment.

We note that these units will not be available to the low- and moderate-income and gap group families. In the event that the developer opts for industrial/residential development, we encourage them to provide some units to the abovementioned groups. Please have them contact Mr. James Miyagi of this Department at 523-4264.

Sincerely,

A handwritten signature in dark ink, appearing to read "Joe K. Conant", is written over a printed name.

JOSEPH K. CONANT

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Joseph K. Conant, Director  
Department of Housing and Community Development  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Conant:

We have received your comments of December 2, 1981 on the above-mentioned project. At present, the applicant proposes to create an agricultural lot or residential subdivision lots on the R-3 zoned portions of the site depending on the method of sewage disposal ultimately allowed. The R-3 Residential District (8+ acres) could provide a maximum of 34 houselots. No buildings are being proposed to be built by Alexander and Baldwin, Inc. at this time. Owners and lessees of the houselots will build structures permitted by the Comprehensive Zoning Code (CZC) and applicable building codes. These owners and lessees may build units that will be within their affordable income. Presently, there are no plans to place architectural design constrictions on the R-3 zoned portions of the site.

We appreciate your prompt review and reply on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

  
for Brian L. Gray

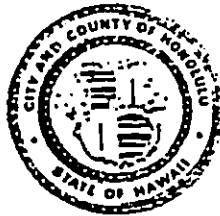
DB:vs:sc  
copy: Cowell & Co., Inc.

988

POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96814 - AREA CODE (808) 955-8111

KILEEN R. ANDERSON  
MAYOR



DEC 8 '81  
Date Received \_\_\_\_\_  
File: \_\_\_\_\_  
To: DB \_\_\_\_\_  
Action: \_\_\_\_\_

FRANCIS KEALA  
CHIEF

OUR REFERENCE HK-ES

December 4, 1981

Mr. Daniel Bills  
Gray, Hong, & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

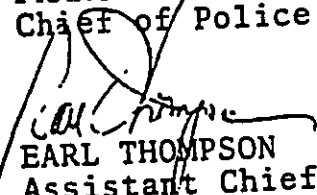
Dear Mr. Bills:

Draft Environmental Impact Statement (EIS)  
Proposed Kahaluu Industrial Project Development  
Tax Map Key: 4-7-13: 1, 10, 11, 12, 16, 24

We have reviewed the Draft Environmental Impact Statement for the referenced project. We have no further comments to add to those provided in response to the previous EIS preparation notice.

Sincerely,

FRANCIS KEALA  
Chief of Police

By   
EARL THOMPSON  
Assistant Chief  
Administrative Bureau

cc: Dept. of Land Utilization

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Francis Keala, Chief of Police  
Honolulu Police Department  
City and County of Honolulu  
1455 South Beretania Street  
Honolulu, Hawaii 96814

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko District, Oahu, Hawaii

Dear Mr. Keala:

We have received your comments of December 4, 1981 on the above mentioned project. We appreciate your prompt review and reply on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

David Bills

DB:vs:cb

cc: Cowell & Company, Inc.

988

DEPARTMENT OF PUBLIC WORKS  
CITY AND COUNTY OF HONOLULU

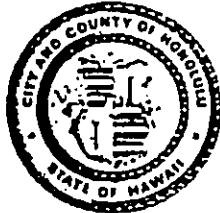
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

RECEIVED DEC 9 1981

To: DB

Action: \_\_\_\_\_

EILEEN R. ANDERSON  
MAYOR



MICHAEL J. CHUN, P.E.  
DIRECTOR AND CHIEF ENGINEER

ENV 81-438

December 7, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Subject: Draft EIS for the Proposed Kahaluu  
Industrial Project Development,  
Kahaluu, Koolaupoko, Oahu, Hawaii

We have reviewed the subject EIS and have the following comments:

1. Alternative No. 1 for the disposal of sanitary sewage proposes the joint use of a force main to the Ahuimanu STP with the proposed Kahaluu Residential and Commercial Development (Market City, Ltd.). Market City, Ltd., is now proposing to pump sewage generated by their development directly into the proposed Kahaluu Sewage Pump Station which is tentatively scheduled for construction in mid 1983.
2. Effluent reuse for crop irrigation is the proposal for Alternative No. 2. What crop(s) is to be grown and by whom? Has the irrigation mass balance, i.e., irrigation requirement less rainfall, already been determined?
3. If surcharging of the proposed fill is contemplated, a stockpiling permit must be obtained.
4. Filling the low lying area in the development where water currently ponds will divert more flows to the opposite bank of North Waihee Stream. This bank will not be improved concurrently and could result in the heavier flooding of the adjacent property(ies). Has this effect been determined? To preclude flooding of adjacent properties, a need to review the grading and drainage studies must be made.



Mr. David Bills

- 2 -

December 7, 1981

5. Since the development is in a FIA Flood Hazard Area (Zone A), a flood determination study is required.

Me ke aloha pumehana,

*William G. Baumst*

MICHAEL J. CHUN  
Director and Chief Engineer

cc: DLU  
Engineering  
Wastewater Management

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Michael J. Chun  
Director and Chief Engineer  
Department of Public Works  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Chun:

We have received your comments of December 7, 1981 on the above-mentioned project. We would like to provide the following comments to your concerns:

1. We appreciate the information provided on Market City, Ltd.'s present plans for sanitary sewage disposal. Based on the information provided, the first alternative for sanitary sewage disposal for the proposed Kahaluu Industrial Project will be revised so that sewage generated by the proposed project will be pumped directly into the proposed Kahaluu Sewage Pump Station. It may be possible that both projects could utilize the same force main. This alternative must be reviewed and approved by the City and County of Honolulu, Department of Public Works, through a preliminary engineering report which we will be preparing.

2. While the exact crop and grower is not yet known, it is recognized that food crops that are irrigated with sewage effluent are undesirable. Therefore, it is foreseen that ornamental crops might be grown if the mauka land is used for agriculture.

A preliminary sanitary sewage disposal study has not been completed at this time, however it is recognized that a determination of the irrigation mass balance will be included in the study.

3. As indicated in your comments, the developer will obtain a stockpiling permit in addition to a grading permit.

4. We are aware that if the adjacent property's bank is not concurrently improved, that slightly heavier flooding of the adjacent property may result. However, the second alternative outlined in the Preliminary drainage Study (Appendix B) which involves the improvement of North Waihee Stream box culvert to accommodate design storm should not aggravate drainage under existing conditions on adjacent properties.

Mr. Michael J. Chun

- 2 -

January 4, 1982

5. We appreciate the information provided on the requirement for a flood determination study. At the time that an SMP application is submitted, a flood determination study will be submitted. The Preliminary Drainage Study provides an assesment to the existing 100-year flood inundation elevation.

The above information will be incorporated in the Revised EIS, in the section "Organizations and Persons Involved in the Public Review Period."

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

---

Brian L. Gray

DB:vs:sc

988

XI. 33



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

P. O. Box 50006  
Honolulu, Hawaii  
96850

DEC 14 1981  
File Received

File: \_\_\_\_\_

To: DB

Action: \_\_\_\_\_

December 10, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, HI 96813

Dear Mr. Bills:

Subject: Draft EIS - Proposed Kahaluu Industrial Project Development  
Tax Map Key: 4-7-13: 1, 10, 11, 12, 16, 24

We have reviewed the above-mentioned document as requested by the City and County of Honolulu's Director of Land Utilization. The following comments are offered to clarify the status of Waihee Marsh, which is affected by this development proposal:

The EIS acknowledges the presence of the wetland in the Environmental Characteristics section. However, the habitat value, while marginal, as discussed in the U.S. Army Corps of Engineers' report, "An Ornithological Survey of Hawaiian Wetlands," is not completely unsuitable for endemic or native birds as is stated on page 44 of the EIS. The Corps' ornithological survey indicates some use of the area by the Hawaiian gallinule.

The statement in Appendix G (p. 14) of the EIS that "There is absolutely no way in which the proposed development can have a detrimental effect on any endemic plant or animal or on any endemic or native ecosystem" is somewhat misleading. The Waihee Marsh is an induced wetland ecosystem resulting from past production of rice. Its present condition is the result of infringement by humans, predators, and grazing animals.

A biological assessment of the Kahaluu Watershed Project (PL-566), made by the Soil Conservation Service to comply with Section 7c of the Endangered Species Act, acknowledges the limited habitat values of Waihee Marsh. This assessment was accepted by the U.S. Fish and Wildlife Service.

Since this ecosystem would be destroyed if the project is constructed, we recommend that the loss of the wetland be included in the Irreversible and Irretrievable Commitments of Resources section of the EIS.

Sincerely,

*Stratford L. Whiting*  
STRATFORD L. WHITING  
District Conservationist

cc: Mr. Michael M. McElroy, Director of Land Utilization,  
City & County of Honolulu



The Soil Conservation Service  
is an agency of the  
Department of Agriculture

XII-A4

SC  
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GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Stratford L. Whiting  
District Conservationist  
U.S. Department of Agriculture  
Soil Conservation Service  
P.O. Box 50006  
Honolulu, Hawaii 96850

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Whiting:

We have received your comments of December 10, 1981 on the above-mentioned project. Please see the enclosed letter from the fauna consultant, Dr. Andrew J. Berger, for a response to your comments. While it is believed that the wetland has limited value, your recommendation to include "the loss of the wetland" in the Irreversible and Irretrievable Commitments of Resources section of the EIS will be undertaken.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Brian L. Gray*  
for Brian L. Gray

DB:vs:sc  
Enclosure: Consultant's letter  
copy: Cowell & Co., Inc.

988

GEORGE R. ARIYOSHI  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P. O. BOX 2360  
HONOLULU, HAWAII 96804

December 8, 1981

OFFICE OF THE SUPERINTENDENT

DEC 15 1981  
CHARLES G. CLARK  
SUPERINTENDENT

Date Received \_\_\_\_\_  
File: \_\_\_\_\_  
To: DB  
Action: \_\_\_\_\_  
\_\_\_\_\_

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Subject: Draft EIS, Kahuluu Industrial Project  
TMK: 4-7-13: 1,10,11,12,16,24

The development of an industrial subdivision on residential zoned land would preclude any future enrollment growth from the subject area.

In the event the alternative residential development occurs, the anticipated student enrollment growth is as follows:

<u>School</u>	<u>Grade</u>	<u>Approximate Enrollment</u>
Kahaluu Elementary	K-6	10 - 30 students
King Intermediate	7-8	4 - 8 "
Castle High	9-12	5 - 10 "

Enrollment growth can be accommodated with existing and planned school facilities. Should there be any questions, please contact Mr. Howard Lau at 737-5231.

Sincerely,

CHARLES G. CLARK  
Superintendent of Education

CGC:HL:mh

cc: Windward District  
Mr. Michael M. McElroy, Dept. of Land Utilization

KL:AE

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Charles G. Clark, Superintendent  
State of Hawaii  
Department of Education  
P.O. Box 2360  
Honolulu, Hawaii 96804

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Clark:

This is in response to your comments on December 8, 1981 on the above mentioned Draft EIS. We appreciate the information provided on the adequacy of Heeia Elementary, King Intermediate, and Castle High schools to accommodate the expected enrollment generated by the proposed project. The Revised EIS has been amended to state the information you provided.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*for*                       
Brian L. Gray

DB:vs:cb

cc: Cowell & Company

988

116 SOUTH KING STREET, RM. 508, HONOLULU, HAWAII 96813 TELEPHONE: (808) 521-0306

XII - 85



# University of Hawaii at Manoa

Water Resources Research Center  
Holmes Hall 283 • 2540 Dole Street  
Honolulu, Hawaii 96822

Date Received DEC 15 1981

To: DB

Action: \_\_\_\_\_

11 December 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King St., Room 508  
Honolulu, HI 96813

Dear Mr. Bills:

Subject: Draft EIS Proposed Kahaluu Industrial Project Development  
TMK: 4-7-13:1, 10, 11, 12, 16, 24  
November 1981

We have reviewed the subject DEIS and offer the following comments:

1. P. 57-58. Alternative No. 2 for sewage treatment and disposal may be infeasible because:
  - a. The R-3 (residential) zoning of the proposed irrigation site would preclude any bonafide farming. The area would undoubtedly go into housing, with which agriculture cannot economically compete for land.
  - b. Being in small lots with individual ownership, there is an inherent difficulty in irrigation management as compared to a larger single management parcel such as a golf course. Also, it is unlikely that any large off-site user of the effluent could be found, considering the abundant availability of non-effluent surface water and the highly fragmented ownership and land use pattern in the surrounding area.
  - c. There is a conceptual difference between using sewage effluent for irrigating recreational fields (golf courses p. 58) as opposed to food crops for direct human consumption. Unprocessed food crops coming into direct contact with sewage effluent (even though treated) is undesirable and aesthetically unacceptable by the public. Watercress in particular (p. 66) could not be grown commercially today on the subject site even without sewage effluent because of stringent Department of Health regulations.

AN EQUAL OPPORTUNITY EMPLOYER

X-AG



Mr. David Bills  
Gray, Hong and Associates, Inc.  
11 December 1981  
Page 2

- d. If the lands are left in its present poorly drained condition for agricultural use, there is obviously no need for additional irrigation water.
  - e. Even if the 8 ± acres of R-3 land was well-drained, there may be little need for irrigation during the wetter winter months. Therefore, the 10-day effluent storage capacity may be insufficient.
2. P. 42, Climate. The 44 inches average annual rainfall seems rather low. We estimate about 60 inches.

This material was reviewed by WRRC personnel. Thank you for the opportunity to comment.

Sincerely,

*Edwin T. Murabayashi*

Edwin T. Murabayashi  
EIS Coordinator

ETM:jm

cc: H. Gee  
Y.S. Fok  
Environmental Center, UH

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Edwin T. Murabayashi  
EIS Coordinator  
University of Hawaii at Manoa  
Water Resources Research Center  
Holmes Hall 283  
2540 Dole Street  
Honolulu, Hawaii 96822

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Murabayashi:

We have received your comments of December 11, 1981 on the above-mentioned project. We would like to provide the following responses to your concerns:

- 1.a. As indicated in the EIS, the method of sewage disposal ultimately allowed determines usage of the R-3 residential-zoned portions of the site. It should be emphasized that it is not the other way around; i.e., that the second alternative, reuse of treated sewage, is not viable because of preferred residential use of the site. At present, however, the preferred method of sewage treatment is off-site. Under this alternative, agriculture would be deleted.
- b. We appreciate your thoughts regarding the difficulties of irrigation management of small separately-owned lots. An agricultural feasibility report will be prepared and will be appended in the Revised EIS. It is the consideration of the agricultural report that R-3 zoned portion of the site should not be subdivided into more than four (4) lots.
- c. We agree that sewage effluent irrigated food crops would be found undesirable. It is felt that ornamental crops will be grown if agricultural use of the R-3 zoned lot is proposed. Agricultural uses such as a commercial nursery are logical.
- d. The existing poorly drained conditions are suitable for such crops as taro, rice and watercress. Cultivation of such crops may not be compatible with industrial use of adjacent portions of the project site. In addition, taro, rice and watercress cultivation cannot

Mr. Edwin T. Murabayashi

- 2 -

January 4, 1981

successfully compete against bananas, some truck crops and ornamental crops in the market place. This matter will be further discussed in the agricultural feasibility report.

- e. At present, the preferred method of sewage disposal is off-site. As indicated by the Department of Public Works, the neighboring Market City, Ltd. development is proposing connection to the Kahaluu Pump Station. The completion date of this project is 1983, which is compatible with the Industrial Project timing.

If on-site disposal must be utilized, the holding capacity will be clearly defined via a detailed engineering report. However, we believe the EIS discusses the major features and the intent of the major features.

- f. We concur with your suggested change in figures. This statement should read, "Average annual precipitation is approximately 60 inches of rain." This and the above information will be incorporated in the Revised EIS.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dal Buis*  
for Brian L. Gray

DB:VB:SC

copy: Cowell & Co., Inc.

BOARD OF WATER SUPPLY  
CITY AND COUNTY OF HONOLULU  
630 SOUTH BERETANIA  
HONOLULU, HAWAII 96843

Date Received DEC 17 1981 EILEEN R. ANDERSON Mayor

File: \_\_\_\_\_  
To: DI \_\_\_\_\_  
Action: \_\_\_\_\_  
YOSRIE H. FUJINAKA, Chairman  
ROBERT A. SOUZA, Vice-Chairman  
MICHAEL J. CHUN  
WALTER A. DODS, JR.  
RYOKICHI HIGASHIONNA  
DORRIS M. HOWARD  
DAT QUON PANG

December 11, 1981

KAZU HAYASHIDA  
Manager and Chief Engineer

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

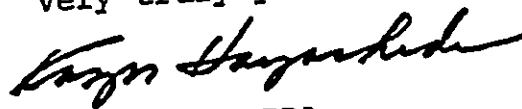
Subject: Draft Environmental Impact  
Statement (EIS) for Proposed  
Kahaluu Industrial Project  
Development, TMK: 4-7-13: 1,  
10, 11, 12, 16, and 24

We have the following comments on the draft EIS for the  
proposed project:

1. Page 15: In addition to the source development charges, the developer would also pay for any improvements required to convey water to the proposed subdivision.
2. Pages 39 and 70: The availability of water for the proposed development will be determined when the construction plans are submitted for our review and approval.
3. Pages 39 and 70: The term "North Waihee Stream" should be changed to "Waihee Stream."

If you have any questions, please contact Lawrence Whang  
at 548-5221.

Very truly yours,



KAZU HAYASHIDA  
Manager and Chief Engineer

cc: Department of Land  
Utilization

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Kazu Hayashida  
Manager and Chief Engineer  
Board of Water Supply  
630 South Beretania Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Hayashida:

We have received your letter of December 11, 1981, commenting on the above-mentioned Draft EIS. We would like to provide the following responses to your concerns:

1. We appreciate the information provided. The developer will also pay for any improvements required to convey water to the proposed subdivision, in addition to the source development charges.
2. Water availability will be determined at the time that construction plans are submitted for your review and approval. This and the above information will be incorporated into the text of the Revised EIS."
3. It is believed that the stream that delineates the northwestern boundary of the property and incorrectly shown on TMK maps as Kaalaea Stream is referred to as North Waihee Stream. We believe your comments suggesting that this stream should be identified as "Waihee Stream" is not correct, although we recognize the stream has many names.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*David Bills*  
for Brian L. Gray

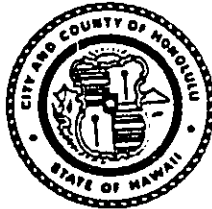
DB:vs:sc  
copy: Cowell & Co., Inc.

988

DEPARTMENT OF GENERAL PLANNING  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

Date Received DEC 17 1981



EILEEN R. ANDERSON  
MAYOR

File: \_\_\_\_\_  
To: DF WILLARD T. CHOW  
CHIEF PLANNING OFFICER  
Action: \_\_\_\_\_ RALPH PORTMORE  
DEPUTY CHIEF PLANNING OFFICER

DGP11/81-4089

December 15, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Draft Environmental Impact Statement (EIS)  
Proposed Kahaluu Industrial Project Development  
Tax Map Key: 4-7-13: 1, 10, 11, 12, 16, 24

We have reviewed the draft EIS and offer the following comments.

The City's Kahaluu Beach Park is located directly adjacent to the makai section of the proposed industrial project site. Presently, the beach park is used for fishing, crabbing, netting and other recreational purposes. With the presence of a fully developed industrial complex, a substantially different amount and type of surface runoff and coastal water mix than exists now will result because of:

1. The composition of industrial discharges.
2. The replacement of filtering capability of the existing vegetation with fill material and urbanization that will reduce existing filtering capability and increase sedimentation and pollution in Kaneohe Bay.
3. The increase in the amount of stormwater runoff since the proposed fill and grading and ultimate

Mr. David Bills  
Page 2

development will create partially impervious surfaces that cannot absorb water as well as before.

Since all surface runoff from the developed site will ultimately enter Kaneohe Bay in the immediate vicinity of the beach park, the potential adverse impact to beach park or near shore usage by the public needs to be discussed.

Sincerely,

*Ralph Kawamoto*

RALPH KAWAMOTO  
Planner

APPROVED:

*W. T. Chow*

WILLARD T. CHOW

cc: DLU

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Willard T. Chow, Chief Planning Officer  
Department of General Planning  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Chow:

We have reviewed your comments of December 15, 1981 on the above-mentioned project. Please refer to the enclosed environmental consultant's memorandum for a response to your concerns. Based upon the consultant's response, it is expected that the proposed action will not adversely affect marine life. Therefore fishing, crabbing, netting and other beach park and near shore usage should not significantly change from existing patterns of use.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dan Bill*  
\_\_\_\_\_  
for Brian L. Gray

DB:vs:sc  
Encl: Consultant's response  
copy: Cowell & Co., Inc.

988



GEORGE R. ARIYOSHI  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF SOCIAL SERVICES AND HOUSING  
HAWAII HOUSING AUTHORITY  
P. O. BOX 17907  
HONOLULU, HAWAII 96817

DEC 17 1981  
Date Received \_\_\_\_\_

File: \_\_\_\_\_

To: DB

Action: \_\_\_\_\_

PAUL A. TOM  
EXECUTIVE DIRECTOR

IN REPLY REFER

TO: 4-105/38

December 16, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Gentlemen:

Subject: Draft Environmental Impact Statement  
Proposed Kahaluu Industrial Project  
Development - TMK: 4-7-13:1, 10, 11,  
12, 16, 24

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

1. The proposed project does not consider affordable housing for the low- and moderate-income families which is much needed in this area.
2. Regarding community character, The Hawaii State Plan (Policy 226-19(b)(7)) states, "Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community." In light of this Hawaii State Plan policy and the views of the Kahaluu Neighborhood Board, the EIS should treat more specifically the measures to be taken in the design which will protect the rural character of the area.

Thank you for the opportunity to comment on this matter.

Sincerely,

PAUL A. TOM  
Executive Director

cc: Department of Land Utilization

X A

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 41, 1982

Mr. Paul A. Tom, Executive Director  
State of Hawaii  
Department of Social Services and Housing  
Hawaii Housing Authority  
P.O. Box 17907  
Honolulu, Hawaii 96817

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Tom:

We have reviewed your letter of December 16, 1981 commenting on the above-mentioned Draft EIS. We would like to provide the following comments to your concerns:

1. At present, the applicant proposes to create an agricultural lot or residential subdivision lots on the R-3 zoned portions of the site depending on the method of sewage disposal ultimately allowed. The R-3 Residential District (8± acres) could provide a maximum of 34 houselots. No buildings are being proposed to be built by Alexander and Baldwin, Inc at this time. Owners and lessees of the houselots will build structures permitted by the Comprehensive Zoning Code (CZC) and applicable building codes. These owners and lessees may build units that will be within their affordable income.
2. It is questionable to characterize the community in question as "rural." The area in the immediate vicinity of the project site shows a mix of industrial, strip commercial and residential uses, as could be expected with land uses surrounding a highway. Therefore the proposed action is consistent with existing land uses in the immediate vicinity of the project site. In other words, we believe the design of the project reflects the character of the community.

We appreciate your prompt review and reply on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Del Bills*  
for Brian L. Gray

DB:vs:sc

copy: Cowell & Company  
988

116 SOUTH KING STREET, RM. 508, HONOLULU, HAWAII 96813 • TELEPHONE: (808) 521-0306

XII P.1



DEPARTMENT OF PLANNING  
AND ECONOMIC DEVELOPMENT

Kamamalu Building 250 South King St. Honolulu, Hawaii • Mailing Address, P.O. Box 2359, Honolulu, Hawaii 96804

Date Rec'd 1/10/81  
George R. Ariyoshi  
Governor  
File: \_\_\_\_\_ Hideto Kono  
Director  
Action: \_\_\_\_\_ Frank Skrivanek  
Deputy Director

Ref. No. 3996

December 16, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

We have reviewed the subject draft environmental impact statement (DEIS) and have the following comments to offer with respect to the objectives and policies of the Hawaii Coastal Zone Management (CZM) Program.

- (1) Recreational resources: Provide adequate, accessible, and diverse recreational activities in the CZM area by adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters.

The DEIS acknowledges that the proposed project will adversely impact the quality of Class AA waters in Kaneohe Bay (p. 38), although proposed drainage improvements will serve to partially mitigate such impact (p. 70). The DEIS also recognizes that the adjacent Kahaluu Beach Park is popularly used for fishing, netting and crabbing (p. 59). The recreational value of the area is further supported by the recent Army Corps of Engineers' Coral Reef Study, which has cited "spectacular and hazard free diving possibilities" in patch reefs clustered in this part of the Bay. In consideration thereof, the EIS should include a discussion of the potential adverse impacts on water quality and the marine life which support these recreational activities.

- (2) Scenic and open space resources: Insure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline; preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources, and; encourage those developments which are not coastal dependent to locate in inland areas.

Mr. David Bills  
Page 2  
December 16, 1981

Portions of the proposed project are located makai of the Kamehameha Highway on land presently thickly covered with hau and mangrove. The DEIS states:

The proposed clearing and grading activities will temporarily improve the aesthetic values and viewplanes of the project site.... Eventual construction of the makai section will remove the visual barrier of the vegetation and may therefore have a positive impact on the aesthetic values of Kaneohe Bay (p. 32).

In the absence of site plans and building designs for the structures eventually occupying this land area, the claim of positive effects on scenic values is speculative. Also, inasmuch as Kahaluu Beach Park is situated directly to the southeast of this section of the subject property, the existing mangrove growth presently provides an effective natural barrier between the noise and visual intrusion of the traffic on Kamehameha Highway and the view northward along Kaneohe Bay. The clearing of this vegetation and the subsequent construction could conceivably detract from the public enjoyment of the existing viewplanes from the beach park.

Furthermore, we note the non-coastal dependent nature of the project. Inasmuch as Chapter 205A-2(c)(3)(D) states that developments which are not coastal dependent should be encouraged to locate in inland areas, we recommend that this policy be more specifically addressed to include the feasibility of confining the proposed industrial subdivision to the mauka section of the project site.

- (3) Economic uses: Provide public or private facilities and improvements important to the State's economy in suitable locations.

The references to the CZM economic objective in support of the proposed project on pages 33 and 74 in the DEIS are inappropriate. This objective and its accompanying policies are intended to guide the development of coastal dependent projects and enter into consideration only after a determination of coastal dependency is made. Coastal dependent uses are those facilities which, if not located adjacent to water or coastal resources, would result in a loss of the quality of goods or services provided. In the case of the subject project, the coastal dependent nature of the proposed use is not substantial in the DEIS.

Mr. David Bills  
Page 3  
December 16, 1981

- (4) Coastal hazards: Prevent coastal flooding from inland projects.

The proposed action entails the filling in of wetlands located in the Waihee drainage basin. Wetlands generally serve a useful purpose as receptors of surface runoff during heavy rainfalls for surrounding areas. Because much of the project site and adjacent parcels lie within the 100-year flood inundation zone and are subject to heavy rainfall, the EIS should include a discussion of such adverse impacts on the environs resulting from the loss of the wetland.

We appreciate the opportunity to review the subject DEIS. Should any questions arise, please feel free to contact us at any time.

Sincerely,

*Hideto Kono*  
for Hideto Kono

cc: Dept. of Land Utilization

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

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

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Kono:

We have received your letter of December 16, 1981 commenting on the above-mentioned project. We would like to provide the following responses to your concerns:

1. Please refer to the enclosed environmental consultant's memorandum for a response to your concerns. Based upon the consultant's response, it is expected that the proposed action will not adversely affect marine life. Therefore, fishing, crabbing, netting and diving should not significantly change from existing patterns of use.
2. We concur that the claim of positive effects is a subjective determination. The sentence, "Eventual construction on the makai section will remove the visual barrier of the vegetation and may therefore have a positive impact on the aesthetic values of Kaneohe Bay" will be deleted from the text of the Revised EIS. Site plans and landscape plans will be developed for the Special Management Area Permit application in conformance with the conceptual plans presented in the EIS.

We appreciate the information provided on the viewplanes from Kahaluu Beach Park. The value of the existing mangrove stand as an effective natural barrier will be noted in the Revised EIS.

As indicated in the Draft EIS, no structures are proposed to be built in the waters of Kaneohe Bay or within the 40-foot Shoreline Setback Area, with the possible exception of drainage improvements to the North Waihee Stream Channel.

3. We recognize your stated position that the project is not coastal dependent, however we must reiterate that the zoning designation for the makai portion of the project site is predominately I-1 Light Industrial. The proposed action is consistent with the existing

Mr. Hideto Kono

- 2 -

January 4, 1982

zoning of the site. As illustrated in Table 1 of the Draft EIS (page 6), there are a number of types of permitted uses for light industrial subdivisions. Some of these uses, such as eating and drinking establishments may be coastal dependent; however, at this stage, no restrictions on types of use have been committed by Alexander and Baldwin, Inc.

4. As indicated in the Preliminary Drainage Study (Appendix B of the Draft EIS) two drainage alternatives are proposed as part of the proposed action. The first alternative involves filling the entire project site to the freeboard elevation for the resulting peak discharge. We are aware that if the adjacent property (along North Waihee Stream) is not concurrently improved, that slightly heavier flooding of that property may result. However, the second alternative of the improvement of North Waihee Stream box culvert to accommodate design storm should improve drainage as compared to existing conditions on adjacent properties.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Brian L. Gray*  
\_\_\_\_\_  
for Brian L. Gray

DB:vs:sc  
Enclosure: Consultant's letter  
copy: Cowell & Co., Inc.



RYOKICHI HIGASHIYAMA, Ph.D.  
DIRECTOR

DEPUTY DIRECTORS:  
WAYNE J. YAMASAKI  
JAMES R. CARRAS  
JAMES B. MCCORMICK  
JONATHAN K. SHIMADA, Ph.D.

121 F.  
1.25  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
P.O. BOX 1088, ST. B.  
HONOLULU, HAWAII 96813

IN REPLY REFER TO

STP 8.7928

December 17, 1981

Mr. Michael M. McElroy  
Director  
Department of Land Utilization  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Draft Environmental Impact Statement  
Proposed Kahaluu Industrial Project  
Development  
Tax Map Key: 4-7-13: 1, 10, 11, 12,  
16, 24

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

We have reviewed the document and found the material on trip generation and projected volumes to be reasonable. We do, however, believe the document should address the possible adverse impact on Kamehameha Highway that may be induced by the cumulative development of this as well as other recently announced development proposals.

Comments on specific points are:

Page 14 - Reference to proposed channelization should also explain associated need of additional right-of-way at that location.

Page 47 - Investigate and clarify why the probable average volumes are lower than the forecasts and actual volumes.

Page 51 - Explain further the expected length of the peak period and whether this will be acceptable.



Mr. Michael M. McElroy  
Page 2  
December 17, 1981

STP 8.7928

If you have any questions, please call Mr. George Shigano  
at 548-3258.

Very truly yours,

*Ryokichi Higashionna*  
Ryokichi Higashionna  
Director of Transportation

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.G. BOW, PE

January 4, 1982

Mr. Ryokichi Higashionna, Director  
State of Hawaii  
Department of Transportation  
869 Punchbowl Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii  
Reply Ref. STP 8.7928

Dear Mr. Higashionna:

We have received your review comments and we are providing the following responses:

Page 14 - The proposed channelization may require a storage lane, acceleration lane and deceleration lane. Should additional rights-of-way be required, this right-of-way will be provided. As you are aware, Kamehameha Highway provides a setback with respect to development for the purpose of future highway improvements.

Page 47 - The traffic volumes presented within the text of the EIS are directly referenced to Appendix H. Your request for investigation and clarification with respect to the discrepancy between probable and projected and actual volumes are explained within the referenced appendix.

Page 51 - There is no reference to the length of the peak hour within the Draft EIS on this page. However, we believe you are referring to the first paragraph of page 54.

To explain further the length of the peak hour, we are making a simplified assumption and applying it to the probable actual volumes as reported. The assumption necessary is that a reasonable peak hour capacity for Kamehameha Highway is 1200 vehicles per hour and the directional split is 80/20. Therefore, in the year 2000 it would take less than two hours to accommodate a peak hour requirement of 1991 peak hourly vehicles. If the year 2000 projected peak hour flow is utilized, then the peak hour could extend to almost 2.5 hours. This is a grossly simplified manner in which to predict length of the peak hour, but we believe the projections are not unreasonable.

Mr. Ryokichi Higashionna

- 2 -

January 4, 1982

We believe the increased length in the peak hour period is acceptable and it only implies that the traffic volume will be higher for a longer period of time. If the capacity of Kamehameha Highway is 1200 peak hour vehicles per hour, commuters will have to adjust accordingly. Commuters are very sensitive about increasing travel time and therefore will leave earlier or later to avoid the increased travel time requirement. This fact is demonstrated through our analogy to Kalaniana'ole Highway as presented in the Draft EIS.

The commuter requirement to leave earlier or later is generally unacceptable and unavoidable. However, to imply that this situation can be mitigated by major highway improvements preceding an extension in the peak hour period is unrealistic from any historical perspective.

We thank you for your review comments. Your comments and our response will be a part of the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dan Bels*  
for Brian L. Gray

DB:sc  
copy: Cowell & Co., Inc.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

300 ALA MOANA BOULEVARD  
P. O. BOX 50167  
HONOLULU, HAWAII 96850

DEC 18 1981

Date Received DEC 1 9 1981

To: \_\_\_\_\_  
IN REPLY REFER TO:  
Action: ES  
Room 6307

Mr. David Bills  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

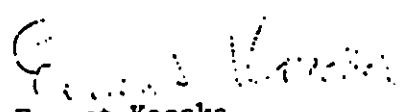
Re: DEIS for Proposed Kahaluu  
Industrial Project Development

Dear Mr. Bills:

We have reviewed the subject Draft Environmental Impact Statement (DEIS) and offer the following comments.

1. The subject DEIS does not illustrate what type of development is proposed for the Kaneohe Bay shoreline. After hao and mangrove trees are cleared, will the shoreline be revetted or otherwise protected from storm wave erosion? If so, consideration should be given to sloping, ungrouted riprap in lieu of grouted walls or vertical concrete seawalls. What impacts will this have upon marine resources and water quality of Kaneohe Bay?
2. The DEIS would be enhanced by a thorough discussion of potential sources for additional water supplies. The consequences of new water development within the Kahalu'u watershed upon agricultural and domestic use, and on fish and wildlife resources should be evaluated here.
3. Mitigation to protect water quality during construction should include consideration of methods to confine suspended sediments to the immediate project area.

Thank you for the opportunity to review the DEIS.

Sincerely yours,  
  
Ernest Kosaka  
Project Leader  
Office of Environmental Services



Save Energy and You Serve America!

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Ernest Kosaka, Project Leader  
Office of Environmental Services  
U.S. Department of the Interior  
Fish and Wildlife Service  
P.O. Box 50167  
Honolulu, Hawaii 96850

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Kosaka:

We have reviewed your letter of December 18, 1981 commenting on the above-mentioned project. We would like to provide the following responses to your concerns:

1. Construction of the proposed industrial subdivision on the makai section of the project site, as indicated in Figure 4 (Proposed Subdivision) illustrates that no structures are proposed to be built in the waters of Kaneohe Bay or within the 40-foot Shoreline Setback Area, with the possible exception of drainage improvements to the North Waihee Stream channel. Individual tenants will develop the ultimate structures on the lots in conformance with the Comprehensive Zoning Code.
2. Please refer to the enclosed figure and table that were used in the accepted Revised Environmental Impact Statement for 42-Inch Waterline from Waihee Booster Station to Intersection of Likelike Highway and Kamehameha Highway, Kaneohe, Koolaupoko, Oahu, Hawaii, prepared by the Board of Water Supply, September, 1980. In addition, statements from the aforementioned EIS, regarding water facilities requirements are provided below:

"The nature of water supply and transmission facilities requires long range plans. Accordingly, the Board of Water Supply in 1976 developed a Windward Oahu facilities plan (sources and transmission lines) for the next decade, based on estimates of demand to year 2000. This plan is reviewed regularly and is updated as required. Although the plan is for the Windward District, it must be understood that water supply problems are inter-related to other areas of Oahu, especially to metropolitan Oahu. (See Figure 2). Figure 3 shows the Windward District Water System and

January 4, 1982

its link with existing and proposed sources, and Table 1 list the existing and proposed water development facilities and their yields (sic) in the area."

"Current projections indicate an increase in water demand from the 17 million gallons per day in 1979 up to about 22 mgd in the year 2000 in the Windward District. The water demand projection is based on a year 2000 population of about 132,000. The total project flow for all Windward Sources is 37 mgd with 15 mgd transported to Honolulu. Water conveyed by the system would be for residential, commercial, industrial, agricultural and other diverse uses."

As indicated in the above comments, the Board of Water Supply has developed plans regarding potential sources of water supplies based on estimates of demand. The Board of Water Supply as a public service agency has and will continue to attempt to provide water for future growth and not for any particular project such as the proposed Kahaluu Industrial Complex. In the past the Board of Water Supply has determined on occasion that adequate water was not available and subsequently caused a project to halt. Therefore, we feel that it may be more appropriate to discuss the environmental impact of new source development in compliance of these types of projects to Chapter 343, HRS and the EIS Regulations.

3. The impact of construction activities can be minimized by adhering to strict erosion control measures, in particular those specified in the City and County of Honolulu Grading Ordinance (1972) and in the State of Hawaii Department of Health's Water Quality Standards, Chapter 37-A (1979). Specific measures are outlined in the section "Mitigation Measures Proposed to Minimize Adverse Environmental Effects," of the Revised EIS.

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dan Bus*  
for Brian L. Gray

DB:vs:sc

Enclosures: figure, table  
copy: Cowell & Co., Inc.

200-12/21-6830

HUI MALAMA AINA O 'KOOLAU

RECEIVED

'81 DEC 21 PM 1:43

TO: Michael M. McElroy  
Director of Land Utilization  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

DEPT. OF LAND  
UTILIZATION  
C. & C. HONOLULU

RE: Proposed A & B Industrial Project Waihe'e, Koolaupoko, Oahu,  
Hawaii, Tax Map Key No: 4-7-13:01, 10, 11, 12, 16 & 24  
Comments on Draft EIS

Dear Mr. McElroy:

Hui Malama Aina O Ko'olau has reviewed the Draft Environmental EIS for the A & B Industrial Development in Kahalu'u and has several comments regarding the inadequacy of this Draft EIS.

Generally, the Draft EIS fails to adequately address the secondary or indirect impacts of this project. OEQC Regulations Section 1:42E requires an analysis of the interrelationships and cumulative Environmental impacts of the proposed action and other related projects. That regulation particularly notes that installation of facilities such as sewer systems and highways may well stimulate or induce secondary effects. Such secondary effects may be more important than the primary effects and should be thoroughly discussed to fully describe the probable impact of the proposed action. Such a discussion should include an estimate of the population and growth impacts of the action on the community and the impacts of such growth on the resource base including land use, water, and public services of the Kahalu'u area.

The A & B draft makes no attempt to determine the amount of population growth which would be induced by this project. Such a project will undoubtedly encourage further urbanization of the Kahalu'u area, and workers brought into the area will likely seek housing and further stimulate development of this rural area. It is particularly important that the cumulative impact of this project, along with other projects proposed for the Kahalu'u area, be considered in this EIS. To the south of this project across the flood control lagoon, there is another shopping and restaurant area proposed; the Market City property which is located at the intersection of Waihe'e Road and Kamehameha Highway proposes to bring a shopping center, including a supermarket and a McDonald's fastfood outlet, as well as other shops and a 20 lot residential subdivision to the area. Further to the north, the Kaalaea subdivision proposed by Barbara Odor and James Wodehouse would bring an additional 60 residential lots to the area. A little further to the north, the proposed Pulama Gardens Planned Unit Development would add 162 high density dwelling units to the Kahalu'u area.

These urbanizing impacts must be considered for the cumulative affect on the people and the resource base of Kahaluu.

The EIS indicates that there are already concerns about the adequacy of the water supply for this project, and does not consider the cumulative impacts of further development in the area upon water resources. In addition, since, as the EIS acknowledges, sewage disposal is a problem in the Kahalu'u area because of the impermeable soils, there would be a need to extend the sewer lines for these projects in order to avoid serious pollution problems. There has been no discussion of these problems or proposals to meet them in the EIS.

We also do not know the types of industrial enterprises which will locate in the project. No attempt is made to specify what types of industrial enterprises will be permitted and the types of environmental impacts which might result from them. For example, will the project involve the storage of hazardous materials? Will there be a danger from spillage of chemicals or petroleum products and their pollution of the waters of Kaneohe Bay. Although a market study was supposedly done for this project, there is no hard data as to the types of uses which would be brought to these industrial lots. The EIS should include a market analysis which surveys the demands for industrial lots and determines the types of industry which are likely to locate in this area.

A second problem that is completely overlooked is the impact of this project on the wetlands where the lots are proposed to be located. The EIS assumes that the property is located at the mangrove trees closest to the ocean makai of the highway. However, the archaeological study and botanical survey both indicates that a large portion of the makai property is underwater at high tide. This being the case, the portion of the property underwater is not A & B property but would be owned by the State of Hawaii. It appears that this project proposes to place fill materials in the submerged lands area in an attempt to create fast lands for the benefit of A & B. The information in these studies also indicates that the mangroves probably have caused the accumulation of the soil in this area by trapping soil which otherwise would flow into the Bay. There is absolutely no analysis of the impact of clearing this site and placing fill material upon it as it relates to the erosion problems which may be created. Removal of shoreline vegetation, particularly mangroves, could result in erosion not only to this parcel but to other properties adjacent to the parcel or located around the Bay. Absolutely no mention is made of this potential significant environmental impact of the project. A matter of great concern to the community residents is the possibility that fill material would be eroded away or washed into the Bay where it would cause considerable environmental damage. No analysis has been presented of this problem.



At page 2 of the Draft EIS, it is acknowledged that the proposed subdivision will foreclose future planning options, such as recreational use. Such an elimination of planning options is defined as an adverse affect under H.R.S. § 205A-26(2)(A). Thus, it is necessary to show that this adverse affect is "clearly outweighed" by public health, safety, or a compelling public interest. No such health, safety, or public interest has been shown which rises to a compelling level requiring this project be built over this marshy area.

At page 24, there is a discussion of the relationship of the project to the Oahu General Plan. In discussing the population policy of the General Plan, the statement is made that the population trend for the Kahalu'u to Kahuku area is consistent with the General Plan's population distribution policy. However, as discussed above, this completely fails to take into account the growth generating nature of a project such as this which has the potential to distort the General Plan population distribution policy and cause greater growth than desirable under the General Plan for this area.

At page 30, the Draft EIS states that there are essentially no coastal opportunities available at present at the project site. Such statement ignores the fact that local residents do use the area for fishing. No provisions are described in the EIS to provide access to the shoreline through the industrial subdivision should the area be improved.

At page 51, the EIS states that traffic projections are based on traffic growth rates within Windward Oahu of approximately 8% per year. The EIS states that the growth is "directly attributable to development" and assumes that the growth will continue at this rate through the year 2000. Such a rate of growth is inconsistent with the earlier statements in the EIS that population on the windward side will be consistent with the population growth policy of the Oahu General Plan. These statements should be reconciled. Furthermore, the EIS appears to assume that the Kahalu'u Industrial Development Project was taken into account in making traffic projections in the year 2000. However, if this project is a significant growth generator for the region, then the traffic analysis could be seriously deficient in providing reliable projections for the future.

The traffic analysis relied upon is incorporated from the traffic analysis used for the Market City project EIS. As pointed out by Hui Malama Aina O Ko'olau, in its comments on that EIS, the traffic projections are seriously inadequate. They are based on traffic figures taken only over a three-day period in which the conclusion was reached that traffic has actually decreased in recent years on Kamehameha Highway in the Kahalu'u area. The fact that the measurements were taken during only a brief period of time and

then extrapolated to year round figures is extremely unreliable. There was no discussion in the traffic analysis as to whether there were any unusual conditions on the days that the traffic flow was measured such as adverse weather or any type of road obstructions. Furthermore, because a light industrial area is likely to have a larger percentage of truck traffic coming into the area, the impacts on traffic flow should be analyzed as a result of slow moving and accelerating vehicles and the number of vehicles making left turns during peak hours.

At page 63, the adverse environmental affects of the project are detailed. On page 64, the Draft EIS apparently attempts to explain why the project is proceeding in spite of significant environmental impacts. In order to justify a project under H.R.S. § 205A-26(2), the applicant must show that there is a public health, public safety, or compelling public interest which outweighs the adverse environmental effects of the project. The only reason given which allegedly falls into any of these categories is that the owners "believe that there is a real economic demand for such facilities". This conclusion is based upon the present lack of undeveloped industrial land anywhere in the windward district. Such reasoning falls far short of establishing a compelling public interest in favor of this project at this marshy site in a rural community. The coastal management program policy set out in H.R.S. § 205A-2(c)(5) relates to economic uses and states a policy to, "concentrate in appropriate areas the location of coastal dependent development necessary to the State's economy." A similar policy provides:

- (c) "Direct the location and expansion of coastal dependent development to areas presently designated and used for such developments and permit reasonable long term growth at such areas and permit coastal dependent development outside of presently designated areas when:
  - (i) Utilization of presently designated location is not feasible;
  - (ii) Adverse environmental affects are minimized; and
  - (iii) Important to the State's economy."

There is absolutely no showing that this industrial development is coastal dependent in any way. The policy of the coastal zone management act that the coastline should be reserved for recreational uses and coastal dependent economic uses such as resort development are frustrated by this proposed industrial lot subdivision.

In addition, this project is inconsistent with the proposed Development Plan for the area as recommended by the Kahalu'u Neighborhood Board. The proposed development plan for the Kahalu'u

area does not propose future industrialization of the Kahalu'u area, but, rather, has as its goal the maintenance of a rural agricultural community. There are many other locations on the island Oahu where industrial development is feasible with far less environmental effects. This project certainly is not critical to the State's economy.

Furthermore, H.R.S. § 205A-26(3) seeks to minimize any filling or otherwise altering of any bay, estuary, rivermouth, slough, or lagoon, any development which would reduce or impose restrictions upon public access to tidal and submerged lands, any development which would substantially interfere with the line of sight toward the sea from the State Highway, and any development which would adversely affect the water quality or existing and potential fisheries and fishing grounds or potential or existing agricultural uses of land. Under all of these criteria, this project is highly inappropriate to the coastal zone. Thus, the compelling public interest weighs against granting a permit for an industrial development at this location.

The letter from the Hawaii Department of Agriculture dated September 9, 1981, included with the Draft EIS, raises the issue of the impacts of the project on other agricultural activities located in the area. The Department of Agriculture specifically requested that, "consideration be given to increased property values, nuisances, and increased pressure to urbanized lands which are currently being used or potentially could be used for agriculture. This should not be limited to just the land adjacent to the subject parcels, but should include lands further mauka which could be affected by spinoff or subsequent urbanization." So far as Hui Malama Aina O Ko'olau is able to determine, there has been no discussion of the secondary impacts of this project upon the farming activities within the Kahalu'u area. There should be an analysis of the effects of increasing urbanization upon the taxes assessed against agriculturally suited land and the ability of those living on and using the land for residential or agricultural purposes to pay those increased assessments. Furthermore, there should be a discussion of the impact of urbanization of the area on agriculture because oftentimes new residents complain about the odors associated with agricultural uses. These pressures to further urbanize this agricultural area should be thoroughly analyzed.

In conclusion, the EIS fails to adequately consider the secondary impacts of this project, the cumulative impacts of the project, and the question of potential erosion or siltation if the wetland area is filled in and the vegetative cover removed. Also the issue of ownership of submerged land is an important issue which must be addressed. Finally, there has been no showing in the Draft EIS that there is any compelling public interest in favor of this project which would outweigh the substantial environmental impacts detailed in the EIS.

Thank you for the opportunity to comment. Should you have any further questions, we will be more than happy to respond.

Sincerely,

*John Lewis Reppun* For *Mel Kalahiki*  
*vice president* *pres.*

MELVIN D. KALAHIKI  
President, Hui Malama Aina O Ko'olau  
45-324 Koakahiko Street  
Kaneohe, HI 96744

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
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DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Melvin D. Kalahiki, President  
Hui Malama Aina O Ko'olau  
45-324 Koakahiko Street  
Kaneohe, Hawaii 96744

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Kalahiki:

We have received your review comments regarding the Draft EIS. We are providing the following responses:

Secondary and Indirect Impacts

Your response letter cites inadequate cumulative discussion of secondary impacts such as sewers, water, highways and population growth. We would concur with your position if the area was devoid of master planning. However, the area has been previously generally planned, the area contains master-planned sewers, the area has a master-planned water system and the area has a master plan for highway improvements. The proposed project and referenced adjacent projects all fit within the scope of the master-planned facilities. It is therefore believed your concern for secondary considerations have been implicitly satisfied to the various government agencies in responsible charge for realization of the master plans. Your requested expansion of the Draft EIS could only be general in nature and would only demonstrate compliance with existing master planning considerations. We further believe such an undertaking would not significantly add to the Revised EIS.

Your response letter requests specific designation of the types of light industrial uses proposed. For your reference, the potential permitted types of uses are stated in Table 1 of the Draft EIS. As, and when, the project proceeds to subsequent stages, more detail will be provided. The additional detail will not depart from the intent and facts presented in the EIS.

Your statement that the Draft EIS completely overlooks the impact on wetlands is incorrect. Please refer to the Water Quality Appendix, Fauna Appendix, Preliminary Drainage Appendix, Flora Appendix as well as discussion in the text. We believe all studies verify that the "potential valuable resource" is not of significant value when analyzed specifically. Nonetheless, a Department of the Army permit will be processed.

January 4, 1982

Foreclosure of planning options as intended in H.R.S. 205A-26(2)(A) assumes that planning was non-existent. In the case of the Kahaluu Industrial Development, it is only proposed to realize what has already been planned.

The Revised EIS states that limited recreational opportunities in the form of fishing, crabbing and netting exist. The Revised EIS also states that it is intended that shoreline access be created adjacent to North Waihee Stream and adjacent to the Kahaluu Beach Park.

The traffic projections assume a growth rate in excess of that which has occurred over the last four years of obvious economic prosperity and growth. The use of an 8% factor is a conservative method to predict the worst case type of analysis. If in fact growth is less than the conservative analysis, the result is that the impact on traffic will not be as significant as reported. The Draft EIS has used a worst case analysis in many areas. We do not see any basis to predict the approach taken with respect to traffic will result in serious deficiencies.

It is a normal procedure to predict traffic growth based on traffic counts. The length of the traffic counting period used by the neighboring project was based on the findings of a qualified consultant with expertise in traffic engineering. However, the Kahaluu Industrial EIS has only used the projected cumulative traffic growth figures to predict what will happen to traffic on Kamehameha Highway Highway in the future. Even if the base line traffic counts are reasonably increased, the traffic analysis presented in the Draft EIS would remain the same.

With respect to your concern for slower moving traffic, the proposed storage lanes, acceleration lanes and deceleration lanes will comply with Department of Transportation standards. The basic concern to allow ingress and egress will be as cited in the Draft EIS.

The conclusion of the Draft EIS was that there are areas of environmental concern, however, the facts presented did not appear of significant nature to proceed. We have not concluded that there are significant environmental adverse effects. Your review has assumed that H.R.S. 205A-26(2) and H.R.S. 205A-2(c)(5) are the only applicable policies and considerations valid for the project. This provides a misleading representation.

The Draft EIS assesses the project with respect to H.R.S. 205A - Coastal Zone Management Program objectives and policies. We believe your interpretation of H.R.S. 205A-2(c)(5) is incorrect if it is implied that the only permissible use within the Coastal Zone Management Area is coastal dependent activity.

The Draft EIS has recognized that the proposed project is inconsistent with the Kahaluu Neighborhood Board's planning consideration for the area. The Revised EIS states the present disposition of the Development Plan for the area.

Your reference to H.R.S. 205A-26(3) has deleted applicable references which state that the activities cited should be minimized based on "reasonable" considerations. We believe one important reasonable consideration is

Mr. Melvin D. Kalahiki

- 3 -

January 4, 1982

site-specific environmental facts. If in fact H.R.S. 205A-26(3) is administered as presented in your review letter, the beginning sentence should read: "The Authority shall seek to eliminate. . . ." However, the beginning sentence reads: "The authority shall seek to minimize, where reasonable. . . ."

Your review comment letter requests information on the effect of adjacent farm lands and in particular, the effect on increased tax assessments. However, taxes assessed against agriculturally-zoned lands are based on a flat rate per \$1000 of assessed value. The flat rate will probably increase with time. However, no substantial increase in total taxes would occur until the assessed value changes. This will generally occur when properties are sold and a purchase price is recorded.

We are also enclosing an Agricultural Feasibility Study for your review which will be incorporated into the Revised EIS as Appendix J.

We thank you for your review comments. Your comments and our response will become a part of the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dal Buis*  
for Brian L. Gray

DB:sc

Enclosure: Agricultural Feasibility Study

988

XIII 1:3

245 North Kukui Street. Honolulu, Hawaii 96817, Telephone (808) 537-5966

DEC 22 1981  
Date Received

File: \_\_\_\_\_

To: DB

December 21, 1981  
Action

AMERICAN  LUNG ASSOCIATION of Hawaii

Mr. David Bills  
Gray, Hong & Associates  
116 South King Street - Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Subject: Kahului Industrial Project, TMK: 4-7-13: 1, 10, 11, 12, 16, 24

We have reviewed the environmental impact statement for the subject project with particular attention to those sections pertaining to air quality impact and have the following comments to offer.

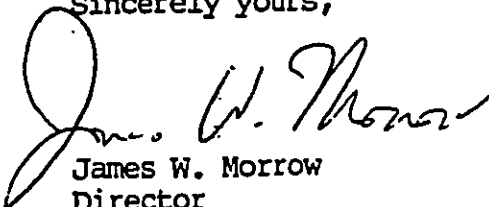
The Air Quality section of the EIS (pp. 39-41) relied entirely on a previous study done for the Kahului Commercial and Residential Development. On the basis of a comparison of traffic generated by the respective projects it was concluded that the proposed industrial project would have an insignificant impact on air quality.

There are two important discrepancies associated with this approach. First, while the individual project impact may well be less due to less traffic generation, no attempt was made to assess the cumulative impact of the project along with existing and other forthcoming projects in the area. It is this cumulative impact which makes relatively small projects such as this significant.

Secondly, the analysis cited from the previous EIS underestimated the impact of traffic on air quality. It was based on motor vehicle emission factors which are now outdated and no longer valid. More recent EPA surveys of in-use vehicles have found significantly higher emission rates. As a result, EPA's MOBILE2 Emissions Model and a related publication (EPA 460/3-81-005) report higher emission factors.

The combined effect of cumulative impact plus higher emission factors will be significantly higher estimates of carbon monoxide concentrations in the project area. This should have been accounted for in the EIS.

Sincerely yours,

  
James W. Morrow  
Director  
Environmental Health

JWM:jm  
C2/L43

Christmas Seals Fight TB, Asthma, Emphysema, Air Pollution

X-AM



GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
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RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.G. BOW, PE

January 4, 1982

Mr. James W. Morrow, Director  
American Lung Association of Hawaii  
245 North Kukui Street  
Honolulu, Hawaii 96817

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Morrow:

We have received your review comments on the subject Draft EIS. Your comments reference recently changed in-use vehicle emission factors and cumulative effects as areas which must be clarified to allow use of the Kahaluu Commercial and Residential Development Air Quality Report. We are providing the following responses.

Emission Factors

The Table 1 below provides the emission factors for carbon monoxide used in the Kahaluu Commercial and Residential EIS as well as the current emission factors which you have referenced.

Table 1  
Emission Factors (gram/mile)

<u>Year</u>	<u>Kahaluu Commercial &amp; Residential Emission Factor</u>	<u>Current Emission Factor</u>	<u>Percent Change</u>
1980	51.50 g/m	54.65 g/m	6%
1987	22.40	30.22	29%
1995	16.00	19.55	22%

If the new emission factors were inserted into Figure 4 - Peak Hour Carbon Monoxide and Figure 5 - Eight Hour Carbon Monoxide graphs of the Kahaluu Commercial and Residential Revised EIS, the peak hour and eight hour State Air Quality Standard would not be exceeded past the years 1983-84. However, neither project can realistically be completed by 1984. For the carbon monoxide 1990 projection to exceed the State Air Quality Standard, the new 1987 carbon monoxide factor (1987 factor was conservatively used to predict 1980 conditions) would have to be 100% greater than the 1978 emission factor which was utilized. We therefore believe this confirms our position that the Kahaluu Commercial and Residential Air Quality Study is more than justified to predict the impact and conclusions stated in the Draft EIS.

Mr. James W. Morrow

- 2 -

January 4, 1982

Cumulative Effects


The critical receptor sites (Sites 1, 2 & 3) for the Kahaluu Commercial and Residential Development are all located within the project's boundaries or the directly adjacent roadway and at a point of maximum traffic congestion. The same result will be found for the Kahaluu Industrial Project and the critical receptor will be in the vicinity of the project entrance.

The distance between critical receptor sites is approximately 800 feet. We believe it is fairly obvious that the cumulative effect will not exceed the 1 and 8 hour State Air Quality Standards when the critical receptor sites will not exceed the standards. While we recognize there are cases where cumulative effects can be compounded and more severe at a greater distance, the conditions do not apply with respect to these projects.

We thank you for your review comments. Your comments and our response will be a part of the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

  
for Brian L. Gray

DB:sc  
copy: Cowell & Co., Inc.



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

DEC 20 1981

Date Received \_\_\_\_\_  
To: \_\_\_\_\_  
To: DB  
Action: \_\_\_\_\_

PODED-PV

21 December 1981

Mr. David Bills  
Gray, Hong, and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, HI 96813

Dear Mr. Bills:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement for the Proposed Kahaluu Industrial Project Development (DEIS).

On 7 October 1981, the District Engineer informed Mr. Brian Gray of your staff of his decision to exercise discretionary authority in requiring an individual permit for the proposed filling of Waihee Marsh. Since then, we have received and reviewed the DEIS and note that the project area is characterized by wetland on both sides of Kamehameha Highway (in 1977, our wetlands inventory covered only portions mauka of the highway due to rights-of-entry limitations). The DEIS did not state whether and to what extent North Waihee Stream is subject to tidal influence. However, observations made by my staff at low and high tides on 11 and 13 December 1981 confirm that the stream is subject to tidal influence and that tidal influence extends mauka of the highway. All wetlands adjacent to navigable waters, in this case waters subject to tidal influence (33 CFR 323.2(b)), require individual Department of the Army (DA) permit processing for proposed discharge of dredged or fill material (33 CFR 323.3a (3)). This includes coastal wetlands and wetlands adjacent to tidal streams. Since the presence of both types of wetland has been confirmed, the proposed project can no longer be considered subject to nation-wide permit/discretionary authority (33 CFR 323.4-4) and must be evaluated under individual DA permit requirements. Please contact our Operations Branch staff at 438-9258 for information regarding permit processing procedures. Since a decision on the application may constitute a major Federal action significantly affecting the quality of the human environment, preparation of a Federal Environmental Impact Statement may be required. We offer the following additional review comments on the DEIS:

a. General Comments: The DEIS does not clarify that the majority of the project area is a wetland. It does not adequately discuss the significance of wetlands nor the irreversible loss of wetland resources which would result from this project. Wetlands are defined as "special aquatic sites" under Subpart E of the Clean Water Act, Section 404(b)(1) Guidelines. Paragraph 230.1(d) of the Guidelines states that "from a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines." Legislation including Section 404 of the Clean Water Act and Executive Order 11990 on the protection of wetlands have focused national

21 December 1981

PODED-PV  
Mr. David Bills

attention on the importance of wetlands. The coastal and adjacent wetlands in the proposed project area have the following functions and values deemed important to the public interest and listed in 33 CFR 320.4(b)(2):

- (1) They serve important natural biological functions, including food chain production, general habitat, and nesting, spawning, rearing and resting sites for aquatic or land species.
- (2) Their destruction or alteration would affect detrimentally natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics.
- (3) They shield other areas from wave action, erosion or storm damage.
- (4) They serve as valuable storage areas for potentially damaging storm and flood waters.
- (5) Through natural water filtration processes, they serve to purify water.

Waihee Marsh, the estuary, and the coastal mangrove/hau swamp contribute to the integrity of stream and coastal waters including those of Kaneohe Bay. The marsh serves now as a grazing area but is environmentally suitable for wetland dependent agriculture and wildlife habitat enhancement. Cumulative impacts of such piecemeal destruction of Windward Oahu wetlands should be addressed in the final EIS.

b. Specific Comments:

(1) Page 13 (Channel Section). The typical channel section shows the proposed fill on the industrial park side of the stream. However, it merely indicates "Potential Fill Slope" for the opposite bank. Except for this drawing, the DEIS does not discuss whether the opposite bank (left bank) will be filled or otherwise improved to provide the required depth and freeboard. Page 4 of Appendix B assumes that development could occur on both sides of North Waihee Stream. Therefore, the typical design section is 100 feet wide. The final EIS should identify definite commitments about improvements on the opposite bank. As presently planned, the proposed development will necessitate either placement of fill material into the section of Waihee Marsh north of the stream or acceptance of increased flooding in this area.

(2) Page 19, paragraph 4 (Environmental Characteristics). This section should clarify that although earlier Corps surveys were limited to areas mauka of Kamehameha Highway, wetlands occur on both sides of the highway, including Tax Map Key (TMK) parcel 4-7-13:01. The discussion of headwaters should be deleted since, for purposes of DA permit requirements, headwaters criteria apply only to non-tidal streams (see 33 CFR 323.2(i)). Headwaters are defined as the point on a non-tidal stream above which the average annual flow is less than five cubic feet per second (cfs) not feet per second (fps) as stated in the DEIS. Instead of discussion of headwaters, the extent of tidal reach of the stream mauka of the highway should be indicated. Wetland boundaries should also be shown in maps of the proposed project area.

PODED-PV  
Mr. David Bills

21 December 1981

(3) Page 20, paragraph f (Summary Technical Data). Recommend the following reference be included: Shallenberger, R. J., An Ornithological Survey of Hawaiian Wetlands. US Army Engineer District, Honolulu, December 1977.

(4) Page 22 (Scenic, Natural Beauty, and Historic Resources). The archaeological reconnaissance (Appendix C) states that "it is certain that this area was once the site of intense taro production." Although no terrace walls or other artifacts appear to remain, the early use of this wetland for taro production contributes to the cultural significance of the marsh. Hawaii is unique in the United States in its tradition of early agricultural and aquacultural use of wetlands. There are few remaining wetlands which have demonstrated the ability to support traditional wetland agriculture. Furthermore, any revival of traditional wetland agricultural practices depends on the availability of suitable areas.

(5) Page 33 (Coastal Hazards). The Corps is currently conducting a detailed analysis of streams in the Kahaolu area to establish flood elevation data for Zone A areas, or approximate areas of the 100-year flood. The 100-year event has a one percent chance of being equalled or exceeded in any given year. Once flood levels have been established, we recommend that proposed structures in flood-prone areas be flood proofed or elevated to or above the base flood level. For conforming structures in flood hazard areas, the development should comply with requirements in the City and County of Honolulu's flood hazard ordinances adopted in September 1980.

(6) Pages 36 & 37 (Soils). We recommend that the location of the borrow sites be identified. The proposed filling of the site will not have "minimal" impact on the existing Tropaquepts as stated since site soils will be completely covered and replaced by an undetermined amount of fill material. This will preclude the use of the Tropaquepts for any other activities or functions. The final EIS should discuss the amount of fill material which will be required for the project.

(7) Pages 37, 38 (Surface Water Quality) & Page 43 (Fauna). The DEIS states that the impact on support and propagation of aquatic life will be negligible since the site contains no suitable habitat for waterbirds, native snails and fishes, and native amphibians. Shallenberger, in his 1977 survey cited above, reported observations of the endangered Hawaiian gallinule and a surprisingly high density of mosquito fish, crayfish, and gastropod mollusks. The latter serve as good sources of food for the omnivorous gallinule. Since that survey, the US Fish and Wildlife Service (USFWS) has reported other observations, particularly during wetter periods, of endangered and non-endangered waterbirds. The final EIS should discuss wildlife observations made by other observers. It should also discuss limitations, methods of study, locations, dates, times, and lengths of observations made specifically for this study. Any findings or conclusions must be presented with a discussion of study limitations. Since marine organisms find habitat in or depend otherwise on coastal swamps and estuaries, a discussion of marine organisms and food chain production should also be included. Furthermore, the DEIS should discuss the potential for improvement or enhancement of the project area wetlands as fish and wildlife habitat.

21 December 1981

PODED-PV  
Mr. David Bills

(8) Page 39 (Groundwater Quality). Proximity to the coast suggests that this wetland provides a wedge of fresh to brackish water which prevents the inland basal intrusion of salt water. The DEIS does not provide an adequate discussion of basal groundwater characteristics in areas above the project site. Replacement of wetland recharge areas with impermeable pavement surfaces may indirectly affect basal groundwater as well as degrade stream and coastal water quality.

(9) Pages 42 & 43 (Flora). The discussion of flora implies that because there are few native plant species in the project area, the vegetation is not significant. Most of the species listed are characteristic wetland plant species of Hawaii. As major components of the wetland ecosystem, they contribute significantly to the functions and values associated with wetlands. Their role in pollution filtering, buffering against storm waves and stream erosion, flood and rainwater storage, food for wildlife and grazing animals, shelter for wildlife, detrital production, scenic values, etc., cannot be ignored and should be addressed in the final EIS.

(10) Page 63 (Environmental Effects). This section should be expanded to include discussions of impacts on the quality of North Waihee Stream; the irreversible commitment of wetland resources to non-water dependent activities; the destruction of actual and potential wildlife habitat; the loss of lands suitable for wetland agriculture, etc., as discussed above.

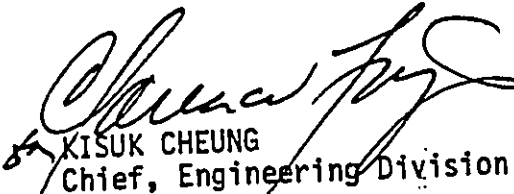
(11) Page 65 (Alternatives). We recommend that a discussion be included on partial development and commitment of portions of the area to water-dependent activities such as wetland agriculture or wildlife habitat improvement to mitigate adverse impacts associated with wetland destruction.

(12) Pages X1 thru B17 (Letter of Response). The letter of response to the Kahaluu Neighborhood Board erroneously states that the project qualifies for a nation-wide DA permit.

(13) Appendix H (Traffic Study). The traffic study is based on 21 dwelling units although page 7 of the DEIS states that a maximum of 34 houselots could be developed. Maps in the traffic study do not agree with maps in the DEIS.

We appreciate this opportunity to provide comments and look forward to receiving the final EIS for this project.

Sincerely,

  
KISUK CHEUNG  
Chief, Engineering Division

CF:  
Mr. Michael M. McElroy, Director  
Department of Land Utilization  
Honolulu, HI 96813

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Kisuk Cheung, Chief  
Engineering Division  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Ft. Shafter, Hawaii 96858

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Cheung:

Thank you for your review comments regarding the subject Draft EIS. We are providing the following responses to your comments:

Introduction

A Department of the Army permit will be processed in accordance with your regulations.

a. General Comments

Your general comments regarding the values of wetlands will be made a part of the Revised EIS and contained within the review comment section. All of the five areas cited within the general comments are discussed within the Draft EIS.

b. Specific Comments

- (1) There are no commitments or definite proposals with respect to land on the opposite bank of North Waihee Stream. The opposite bank area is within Zone A of the Federal Flood Insurance Rate Maps. The opposite property must fill to allow structures, if structures are proposed at some time in the future. If no improvements are ever contemplated, then the area will continue to be subject to flooding as presently occurs. The hypothetical opposite stream bank only allows consideration of the most critical drainage analysis. That occurs when both sides of North Waihee Stream are filled.

Alternative No. 1 of the Preliminary Drainage Study poses no improvements to the existing inadequate box culvert under Kamehameha Highway at North Waihee Stream. If no improvements occur on the opposite bank of North Waihee Stream and the

January 4, 1982

project site is filled, there will be an increase in flooding on the adjacent land, but the increase will not significantly elevate the 100-year flood inundation level.

Alternative No. 2 of the Preliminary Drainage Study poses improvement to the existing box culvert when Kamehameha Highway. This alternative will reduce the 100-year flood inundation level on the adjacent parcel as compared to existing conditions.

- (2) The Corps' findings regarding the location of wetlands and dismissal of headwater factors will be incorporated into the Revised EIS via this letter. The typographical error changing feet per second to cubic feet per second will be amended in the text. Finally, the limits of Waihee Marsh have been added to the text. It is further assumed that all lands mauka of the Marsh are considered wetlands by the Corps.
- (3) Your recommendation regarding additional ornithological references has been forwarded to the fauna consultant, Professor Andrew Berger. His response discussing fauna in general is attached.
- (4) We have attached the Department of Land and Natural Resources response letter discussing the possibility of significant archaeological findings in the area. Please note that it is the intent to have an archaeological consultant available for development. This information was contained within the Draft EIS.
- (5) The Preliminary Drainage Study provides a preliminary analysis of the 100-year flood inundation level for the area. The project will comply with the City and County's flood hazard ordinance.
- (6) It is difficult to locate the proposed borrow site at this preliminary stage. The Draft EIS identified the most likely type of fill due to fill qualities and abundance within windward Oahu. Two potential sites are available on Ahuimanu Road. The borrow site for any potential fill is controlled through the City and County of Honolulu's Grading Ordinance.
- (7) We are attaching both the fauna consultant's comments and water quality consultant's comments to address your concerns.
- (8) Your conclusions and assumptions regarding potential indirect interference with the basal groundwater have no basis and are highly speculative. There is no chance for recharge of the potable aquifer in this region. As stated in the EIS, the site is not within the Board of Water Supply's no-pass zone.
- (9) The potential elimination of flora common to the Hawaiian environment does not pose a significant impact to the species cited in the Draft EIS. The Corps Wetland Survey, prepared by Margorie Elliot that identifies 90% of the site contains California grass. The loss of California grass in itself cannot be considered significant.



Mr. Risuk Cheung

- 3 -

January 4, 1982

We share your recognition that the associated values of flora as referenced in your letter, from a general and broad perspective, are important for any wetland. However, your comment has taken no consideration to the facts presented in the Draft EIS. The Draft recognizes the pollution filtering effects of wetlands and the proposed impact as well as the effects of stream erosion and the proposed impacts. The Draft EIS recognizes flooding and rainwater storage and the impacts. The Draft EIS also recognizes the potential for habitat and the impact of its loss. These facts have been presented, however, your reviews only state these areas cannot be ignored.

It has also been implied that the wetlands serve a significant function as a buffer against storm waves. However, the Corps of Engineers were responsible for the development of the Flood Insurance Rate Maps. Based on these maps, the project's shoreline is not subject to coastal flooding or wave action.

- (10) The loss of potential wildlife habitat has been presented in the Draft EIS. We are also providing the fauna consultant's response letter as previously indicated. The Revised EIS will contain Appendix J - Agricultural Feasibility, which is attached for your review.
- (11) Based on the Agricultural Feasibility Study contained in the Revised EIS and the information within the Draft EIS on habitat potential, we do not believe your suggested additional alternative will be appropriate.
- (12) Based on your review comment letter we will change the statement that the project does not qualify for a nation-wide DA permit. However, all previous correspondence indicated that the project could qualify.
- (13) Upon your re-examination and review of the Draft EIS, you will find that Appendix H does not pertain in full to the subject project. Only Kamehameha Highway traffic projections of Appendix H were utilized for the Kahaluu Industrial Project. The text and cover page of Appendix H reference this fact.

We thank you for your review and comments regarding the Draft EIS. Your comments and our response will be a part of the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dan Buis*  
for Brian L. Gray

DB:sc

Enclosures: Consultant's letter  
DLNR letter  
Agricultural Feasibility Study

988

XII 101

KAHALUU NEIGHBORHOOD BOARD NO. 29  
c/o KAHALUU COMMUNITY CENTER  
47 232 WAIHEE ROAD  
KANELOHE, HAWAII 96744  
IMEEIA KEA KAHALU'U, WAIHE'E, WAIAHOLE, WAIKANE, HAKIPUU AND KUALOAI



RECEIVED DEC 23 1981

TO: \_\_\_\_\_

FROM: DE

ACTION: \_\_\_\_\_

"Let us not ever have  
an unhappy minority"

December 9, 1981

Mr. Brian L. Gray  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Proposed A & B Industrial Project  
Waihe'e, Ko'olaupoko, O'ahu, Hawai'i  
Response to Draft Environmental Impact Statement

Gentlemen:

This letter is our response to the subject Draft Environmental Impact Statement. The Kahalu'u Neighborhood Board No. 29 appreciates this opportunity to comment further on the proposed project. We find that the draft document fairly well describes proposed actions and their potential impacts. However, the Board still has serious concerns regarding the project as were previously expressed in our letter dated August 26, 1981 which responded to the Draft E.I.S. Preparation Notice.

We have prepared the following general and specific comments relating to the proposed project as described in the Draft E.I.S.:

General Comments

While the Board has expressed it's preference towards certain proposed land uses for the Community in particular and the region in general, we feel that it is an injustice to the other readers and decision makers to simply state, in summary, that the Board is in opposition to the proposed project without an explanation as to why the Board is in opposition.

Because of the uncertainty of the final or exact land uses and activities proposed, the potential impacts relating to each and every use, or combinations thereof, should be thoroughly discussed in order that rational decisions can be made with regard to the probable impacts. For example, the proposed actions relating to the mauka portion of the project site are inadequately covered. The alternative proposals for either residential or agricultural land use and the impacts that each use would have should be fully addressed.

Furthermore, road access to the mauka portion of the site should be fully discussed.

Possible land disposition methods should be discussed. Selling lots in

in fee would certainly negate any controls suggested unless such controls are provided in restrictive deed covenants.

Public access should be provided along the full lengths of the Kane'ohē Bay shoreline and Haiamoa Stream.

It would be helpful to know when some of the proposed actions will become final. At this preliminary planning stage it is very difficult to assess final impacts without knowing when proposals will be implemented.

Finally, it appears that the various special studies were conducted without adequate consultation with the project proponents. The several consultants made their studies without comprehensive knowledge of the total project. For example, the drainage study assumes that the 8 acre mauka portion of the site will be used for agriculture whereas the E.I.S. description of proposed action suggests that these 8 acres may well be used for as many as 34 residential house lots.

Specific Comments

p. 11 - Grading: Large acreages of filled land would remain in a raw and denuded condition for as long as 3 years while proper settlement occurs. What actions are proposed to prevent soil erosion and run-off into the class AA waters of Kane'ohē Bay?

p.11 - Drainage: The drainage study proposes that the mauka portion of Haiamoa Stream be channelized to a width of 100 ft. What actions are proposed for the makai portion of the stream? We must emphasize that, under no circumstances, should any channel be concrete lined. Furthermore, we suggest that the State DOT be consulted to determine what actions would be taken to correct the inadequate existing culverts under Kamehameha Highway.

p. 14 - Roadways: Access to the mauka portions of the site should be discussed. Because of existing problems along Kamehameha Highway, the proposed project definitely would require storage, acceleration and deceleration lanes.

p. 15 - Sewage Disposal, Alternative No. 1: Because of the proposed project site's low elevation and proximity to Kane'ohē Bay, connection to a municipal sewer system would be the only acceptable sewage disposal alternative.

p. 16 - Sewage Disposal, Alternative No. 2: This dual treatment/irrigation alternative should be discussed more fully with special attention given to actions that would safeguard the public. The possibility of a person drinking from the sewer effluent pipes is real!

p. 30 - Recreation Opportunities: It should be noted that fishing and crabbing are traditional recreational endeavors in this area. Thus, it is incorrect to state that there are no coastal recreational opportunities.

p. 42 - Noise: Following construction of the project, what actions would be taken to mitigate and minimize the impacts on surrounding residential and

KAHALU'U NEIGHBORHOOD BOARD NO. 29  
Proposed A & B Industrial Project  
Response to Draft Environmental Impact Statement  
Page 3

recreational areas and educational facilities of noise created by industrial activities?

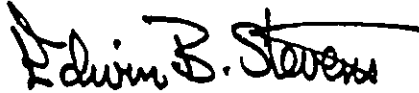
p. 43 - Fauna: How many field trips were conducted to determine the existence of native fauna? Have historic records of sitings been investigated to determine the existence of endangered native waterbirds?

p. 45 - Visual Considerations: What actions would be taken to mitigate the adverse visual impacts of proposed industrial uses, such as open storage, on lots adjoining or in close proximity To Kahalu'u Beach Park, 2 churches, Kahalu'u Elementary School, KEY Project and existing residences?

The above comments notwithstanding, we must continue to emphasize that the proposed Industrial Project at Waihe'e is inconsistent with the State Plan and the City and County General Plan the objectives and policies of which are to direct urban growth to the Primary and Secondary Urban Centers, to preserve Agricultural Lands and to maintain Rural Communities. Those plans fairly represent the Goals of our Kualoa to He'eia Community.

Thank you again for the opportunity to comment. Should there be any questions, do not hesitate to call upon us. If appropriate, we will schedule time for you at one of our Board meetings to further discuss our concerns.

Sincerely yours,



Edwin B. Stevens, Chairman  
Kahalu'u Neighborhood Board No. 29

cc: Ms. Robin Lee, Alexander and Baldwin, Inc. - Properties Group  
U.S. Army Corp of Engineers  
Department of Land Utilization  
Department of Parks and Recreation  
Kahalu'u Neighborhood Board No. 29 - Chairman  
- Planning Committee  
- Ko'olaupoko APF

Kahalu'u Community Resource Center  
Neighborhood Commission

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Edwin B. Stevens, Chairman  
Kahaluu Neighborhood Board No. 25  
c/o Kahaluu Community Center  
47-232 Waihee Road  
Kaneohe, Hawaii 96744

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Stevens:

We thank you for your review comments on the subject Draft EIS. We are providing the following responses to your general and specific comments:

General Comments

Your consultation comments are a part of the Draft EIS. Within the summary, a reference has been added to the consultation letter section to specifically indentify the Board's objections and the explanation of these objections. However, due to the large discrepancy regarding planning policies between the Proposed Industrial Project and the Board's desire for agriculture/rural/open space development, it was felt that this represented an unresolved issue.

The final and exact land uses of all 26 acres cannot be determined at this early planning stage and therefore discussed with respect to each other as requested. Within the light industrial classifications, Table I presents 21 representative types of permitted uses. However, certain CZC permitted uses (such as heliports and airports) were deleted and were dismissed as unlikely land uses. The only major land use alternatives presented within the Draft EIS were agricultural and residential use on the R-3 mauka portion of the site. With respect to environmental impacts and particular technical impacts (i.e., drainage, water, sewer, traffic, landscaping, grading, noise, air quality, etc.) it is apparent that a combination of industrial and residential will produce the greatest possibility of environmental degradation. Therefore, a worst case analysis of industrial/residential was utilized. The exception to this approach is agricultural use/industrial use with respect to water quality. However, the preferred method for sewage treatment, at this time, is connection to the Kahaluu Pump Station. This is the method proposed by the neighboring Kahaluu Commercial and Residential Development.

Mr. Edwin B. Stevens

- 2 -

January 4, 1982

Road access to the mauka portion of the site is proposed via a 56-foot right-of-way connecting to Kamehameha Highway as presented on Figure 4. As also referenced in the Draft EIS, there may be a realistic need to provide a left-turn storage lane for vehicles entering the site, a deceleration lane and an acceleration lane. The purpose of the channelization devices is to allow minimum interruption to through traffic while allowing ingress and egress to the project site. We believe this provides a reasonable discussion of the facts for the EIS.

It has not been determined whether the proposed lots will be leased or sold in fee. The landowner's consultant is presently considering whether it would be appropriate to create restrictive deed covenants or lease restrictions for the 5-acre makai parcel to reduce permitted uses as prescribed by the Comprehensive Zoning Code. It is also the intent of the project to provide an aesthetic environment more closely resembling the recent light industrial subdivision at Waipio developed by Gentry. This basic philosophical approach was transmitted to the Kahaluu Neighborhood Board via slide projections at one of your October, 1981 Board meetings.

Public access to the shoreline will be provided in accordance with Shoreline Access Rules and Regulations, Shoreline Setback Rules and Regulations and Park Dedication requirements, as applicable and as stated in the Draft EIS. To expand on this subject, shoreline access is anticipated to be provided adjacent to North Waihee Stream and adjacent to Kahaluu Beach Park. The extent and details of access are a specific concern of the Special Management Area and must be coordinated during SMP proceedings.

A preliminary project schedule is provided in the Draft EIS. This time schedule may be increased by two years due to various permit requirements. We anticipate the Department of Land Utilization will make a determination as to the sequential order for processing of various federal, state and local clearances. Therefore, completion of the subdivision development may take between four and six years.

As referenced under paragraph 2 of the General Comment response, specialized consultants were directed to analyze the worst case alternative. The Preliminary Drainage Study describes the proposed project as Industrial-Agricultural development. However, all calculations assume complete industrial development over 26 acres. This approach provides the most conservative method to analyze the site.

Specific Comments

p. 11 - Grading: During the surcharge period all fill material must be grassed. Due to the size of the project grading must occur in increments. Each increment must have erosion control devices in place prior to the commencement of grading. Further, each increment must be planted in vegetal cover prior to commencing with subsequent increments. These controls are specified under the Grading Ordinance of the City and County of Honolulu.

January 4, 1982

P. 11 - Drainage: The major reason for the extensive flood zone designation (Zone A) within the area mauka of Kamehameha Highway is due to the inadequate capacity of the existing box culvert under Kamehameha Highway at North Waihee Stream (Kamiamoa Stream). Kamehameha Highway is elevated and therefore acts as a draw with an overflow weir as described in Appendix B. Drainage improvements will be implemented in accordance to one of the proposed alternatives. Primary review with respect to drainage considerations is under the jurisdiction of the U.S. Army Corps of Engineers and the City and County Department of Public Works. However, the State Department of Transportation is also directly affected.

We share your concern that the use of a concrete-lined channel represents the harshest environmental treatment for the makai portion of North Waihee Stream. However, the degree of harshness is a relative question which has been analyzed in the Preliminary Drainage Study (Appendix B) and the Environmental Aspects of Stormwater Runoff (Appendix D). The primary concern of drainage improvements is public safety and welfare. Secondary to public safety are environmental considerations. Both considerations must be achieved to the satisfaction of the technical review agencies, previously cited.

P. 14 - Roadways: We believe access to the mauka project area is adequately discussed as presented with the likelihood that minimum requirements will include storage, acceleration and deceleration lanes.

P. 15 - Sewage Disposal, Alternative No. 1: At present, the preferable method of sewage treatment is connection to the Kahaluu Sewage Pump Station. This pump station is scheduled to begin construction in mid-1983 and be completed in mid-1984. The preliminary engineering report referenced in the Draft EIS must be completed and approved to verify adequacy prior to Special Management Area Permit proceedings.

P. 16 - Sewage Disposal, Alternative No. 2: The major features of the on-site treatment option are outlined in the Draft EIS. These features include secondary treatment, disinfection, sand filtration and storage. The distribution network will require safeguards including ample identification and training of workers. This option, since the time of the Draft EIS, has become the secondary choice for sewage treatment.

P. 30 - Recreational Opportunities: The Revised EIS will be corrected to make the statement that coastal recreational opportunities are limited and further state that fishing and crabbing are recreational endeavors generally occurring in the area.

P. 43 - Noise: As stated in the Draft EIS, noise resulting from industrial development is limited by the Comprehensive Zoning Code (CZC) as well as Public Health Regulations - Chapter 44-A and Chapter 44-B. The CZC specifies additional reductions in noise resulting from light industrial districts abutting residential and traditionally more quiet zoning districts. Landscaping and larger landscaping buffer strips between different zoning districts will also mitigate and minimize potential noise impacts.

Mr. Edwin B. Stevens

- 4 -

January 4, 1982

p. 43 - Fauna: One field trip was conducted during the preparation of the Fauna Report - Appendix G. The conclusions of the report are provided in the text with appropriate reference for reviewers with particular technical interest. Fourteen bibliographical references are cited of which six specifically pertain to avi-fauna.

p. 45 - Visual Considerations: As referenced within the general comment response section, particular interest, including deed restrictions and lease restrictions, are proposed in excess of maximum CZC requirements to minimize and mitigate visual impacts from all public facilities and residences. The EIS presents this fact. The SMP proceedings will more fully develop this intent.

Conclusion

The concluding paragraphs of your review letter state that the proposed project is inconsistent with the State Plan and City and County General Plan. We do not believe this is a totally correct statement. Both the State Plan and General Plan contain many broad policies and objectives. Some objectives are compatible with the project while others, as you have referenced, are incompatible with the project. Notwithstanding all the foregoing review comments, this particular issue appears to be unresolvable with respect to the project as proposed.

We appreciate your review and comments on the Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Brian L. Gray*  
\_\_\_\_\_  
for Brian L. Gray

DB:sc  
copy: Cowell & Co., Inc.



DEPARTMENT OF PARKS AND RECREATION  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET  
HONOLULU, HAWAII 96813

DEC 23 1981  
Date Received

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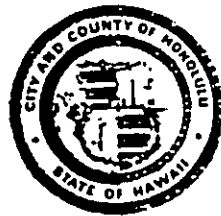
Action:

ROBERT K. MASUDA  
DIRECTOR

SAM L. CARL  
DEPUTY DIRECTOR

OSCAR K. ASAHINA  
EXECUTIVE ASSISTANT

EILEEN R. ANDERSON  
MAYOR



December 10, 1981

Mr. David Bills  
Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

SUBJECT: REVIEW AND COMMENTS ON THE DRAFT  
ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE  
PROPOSED KAHALUU INDUSTRIAL PROJECT DEVELOPMENT  
TMK: 4-7-13: 1, 10, 11, 12, 16 & 24

We have reviewed the above-mentioned EIS and would like to once again reiterate that we have no objection to the proposed project in general, except for the development of the shoreline makai of Kamehameha Highway. Although the area is zoned for light industry, we feel that it would be more beneficial and compatible with the environment if the area was left as open space.

At the adjacent Kahaluu Beach Park it is our intention to preserve the mangrove/waterfront areas as existing because the mangrove protects the existing shoreline. We are apprehensive that by filling in the makai portion for your industrial development, water quality and current could be altered negatively. Also, by constructing industrial-type buildings on the shoreline, the rural quality of the Kahaluu shoreline will be irretrievably lost.

Further, we are concerned with the artificial manner by which land levels are being raised (Figures 5 and 6 - typical design sections).

The Kahaluu Flood Control Channel and Lagoon, especially the lagoon, are very compatible with the region by virtue of its use of natural materials and free form configuration. Would it be possible to fill adjacent to North Waihee Stream so that it results in a more natural stream section?

Last but not least, what are the unsettled ramifications of the veto of the Kahaluu-Koolaupoko Development Plan?

Mr. David Bills  
December 10, 1981  
Page 2

These are a few of the questions which have come up during the review.

If there are any further questions or requests, please contact Mr. Robert Fujiwara at 523-4885.

Sincerely yours,

  
ROBERT K. MASUDA, Director

RKM:vc

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Robert K. Masuda, Director  
Department of Parks and Recreation  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Masuda:

We have reviewed your letter of December 10, 1981 commenting on the above-mentioned project. We would like to provide the following responses to your concerns:

1. We recognize your objection to the development of the makai portion of the project site. Your objection will be noted in the Revised EIS, under the section, "Summary of Unresolved Issues."
2. As indicated in the Draft EIS, mitigation measures will be taken to confine suspended sediments to the immediate project area. These erosion control measures are specified in the City and County of Honolulu Grading Ordinance (1972) and in the State of Hawaii Department of Health's Water Quality Standards, Chapter 37-A (1979). Specific measures are outlined in the section "Mitigation Measures Proposed to Minimize Adverse Environmental Effects," of the Revised EIS.

It is questionable to characterize the Kahaluu shoreline as "rural." The area in the immediate vicinity of the project site shows a mix of industrial, strip commercial and residential uses, as could be expected with land uses, surrounding a highway. Therefore, the proposed action is consistent with existing land uses in the immediate vicinity of the project site.

3. We recognize your concern "with the artificial manner by which land levels are being raised." However, it should be noted that the proposed filling is necessary to raise the project out of the flood plain. It is the well-known recommendation of the Army Corps of Engineers that proposed development in flood-prone areas be flood proofed or elevated to or above the base flood level. The proposed filling represents an effort to comply with this recommendation, and to protect property and possibly lives from natural disasters.

Mr. Robert K. Masuda

- 2 -

January 4, 1982

4. We share your opinion regarding the Kahaluu Flood Control Channel and Lagoon and its compatibility with the region. Simply stated, the proposed drainage improvements only involve raising the bank height on either side (50 feet) from the North Waihee Stream and Property Line - Figure 6) to an elevation above the water surface created by the 50-year design storm. It is not proposed that the "path" of the stream be changed. It is important to emphasize that the primary concern of drainage improvements is public safety and welfare. Secondary to public safety are environmental considerations. Both considerations must be achieved to the satisfaction of the U.S. Army Corps of Engineers and the City and County Department of Public Works.
5. At present it appears that the earliest that the Kahaluu-Koolaupoko Development Plan will be available for review is March, 1982. In the mean time, the DLUM designation of light industrial and residential are still the standard with respect to the General Plan. The Revised EIS has been amended to state the current status of the general planning designations.

We appreciate your review and reply on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*for* Dan Gray  
Brian L. Gray

DB:vs:sc

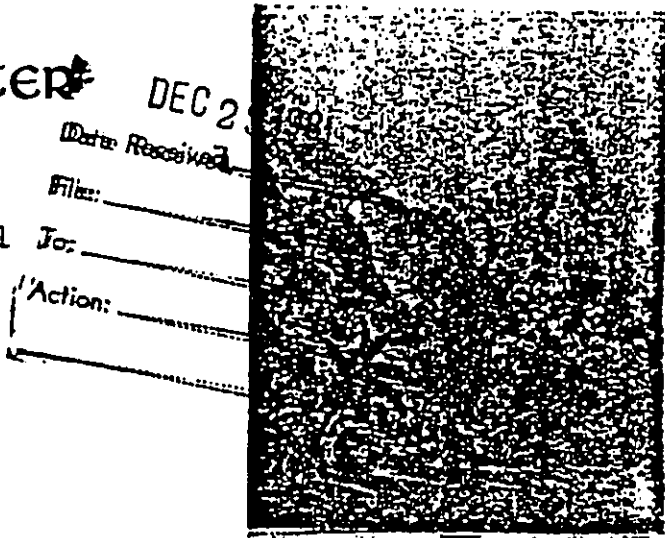
copy: Cowell & Co., Inc.

The SIERRA CLUB, Hawaii Chapter

Post Office Box 22897, Honolulu, HI 96822

Telephone: (808) 946-8494

December 21, 1981



Mr. David Bills

Gray, Hong and Associates, Inc.

116 South King Street, Room 508

Honolulu, Hawaii 96813

*Nuuanu Pali, by Fisquet, 1837*

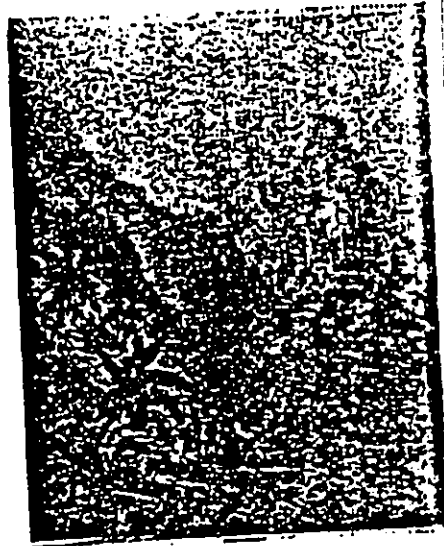
re: Draft EIS for the Kahaluu Industrial Project Development

The Sierra Club objects to the concept of an industrial project development in this Special Management Area. Dave Raney of Sierra Club was long involved in the formulation of the State CZM law, and finds that such a project is counter to the concept of this law. Much has been done to clean up and to protect the Class AA waters of Kaneohe Bay. This project is located in a portion of the Bay where the natural cleansing action is limited. Certainly light industrial use will not contribute to the effort to maintain these waters in their present classification. Note in the project summary (page 2) "In addition, there will be a permanent increase in the amount and velocity of stormwater runoff". It should be added that this water will contain silt as well as poisonous lead compounds from increased use of the highway. Silt alone has previously contributed to much of the decrease in coral growth in Kaneohe Bay. Increasing the amount and velocity of stormwater runoff has been most destructive to clam production in the Bay. Much has been learned about the protection of a natural resource such as Kaneohe Bay in the twenty years since this area was mistakenly zoned "commercial" and "industrial". This whole area of Kahaluu is wetland or wetland-adjacent. It serves a most important purpose in an eco-system that is comprised of heavy rainfall in near-by mountains, the resultant streams and rich flatland, all merging into the Bay. Natural water run-off that is controlled by heavy vegetation, sifts out the silt and poisons and sends to the bay slow-running water rich in nourishment much needed for fish propagation. Fish production in the Bay has fallen off drastically with the increase in development.

The State's long term environmental policies speak to the preservation of important natural resources. We should not go counter to these policies by allowing past errors in zoning to be compounded by continuing this kind of development. The project is also counter to the City and County General

## The SIERRA CLUB, Hawaii Chapter

Post Office Box 22897, Honolulu, HI 96822  
Telephone: (808) 946-8494



Plans for this area which are waiting adoption.

We do not feel that the argument is valid that there is a limited supply of vacant land zoned for industrial use on the Windward side. If the City and County is to be consistent, such necessary zoning must be provided in areas that are contingent with presently urbanized land.

It is not good planning, in light of the Island's dependence upon outside energy sources, to place industrial projects this distance from any related activities. This project definitely contributes to "urban sprawl".

This project will put a severe strain on the infrastructure of the area, as well as upon the Island's resources. An impossible situation will be created with the narrow and already crowded Kam. highway. We have reviewed the situation on this highway and find that the periodic, peak-time use is extremely heavy and often dangerous in this particular area. We know of no State plan to greatly improve this stretch of road. Project use during construction and after will no doubt coincide with these peak times, since they cover a fairly long period.

Serious attention must be paid to the problems of water supply and sewage disposal. We feel that water supplies should not be committed to any large project until the State establishes standards of minimum stream flow and until the State Legislature deals with the formulation of a water policy. Farmers on the Windward side have every justification to be concerned about water being committed to urbanization projects when their own water needs are threatened. Our water supply is our number one State resource and should not be dealt with lightly. Sewage disposal is also a particular problem in this area as is stated in the EIS. To grant permits for further development until these serious problems are dealt with is putting the cart before the horse and again constitutes bad planning.

We feel that A&B, as long time and respected members of Hawaii's business community can most certainly evolve a plan for the use of their land which is more creative and which will contribute more to the economic and social welfare of the community and to the wise use of an important resource. Planning for industrial development in such an unsuitable location is not creative, nor even challenging, and most certainly is not far-sighted.

*Lola Mench. Legislative Chairman*  
XIII- A12

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Ms. Lola Mench, Legislative Chairperson  
The Sierra Club  
Hawaii Chapter  
P.O. Box 22897  
Honolulu, Hawaii 96822

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Ms. Mench:

We thank you for your review comments. However, many of your objections and areas of concern have been specifically addressed within the Draft EIS. Your broad and general treatment of the project appears to represent a policy statement or position paper rather than review comments. We are providing the following responses to the general topics which you reference.

Water Quality - Kaneohe Bay

The Draft EIS specifically points out that the proposed project will have a permanent impact on the quality of Kaneohe Bay. Further, the impact is quantified as representing 2.0 percent of the peak design discharge from North Waihee Stream into Kaneohe Bay and less than 0.1 percent of the total net runoff entering Kaneohe Bay. The referenced and appended Environmental Aspects of Stormwater Runoff specifically and quantitatively predicts increases in suspended solids, nitrogen, and phosphorus. These parameters, through various studies, have been attributed as the more sensitive issues with respect to Kaneohe Bay water quality effects.

It is correct to generally state that the increase in amount of stormwater runoff and velocity will inhibit clam production and that fish propagation in the bay has fallen off. However, to imply with the use of adjectives such as "most destructive" and "drastically" that this particular project will pose a significant alteration to the bay is not based on any sound scientific principle.

Planning

The State's long-term policies include environmental policies, economic policies, and growth policies, all of which are interrelated and very broad. Parts of these policies compliment each other while other parts are contradictory. We believe there are no clear-cut rights or wrongs when attempting to evaluate specific projects with respect to broad

Ms. Lola Mench

- 2 -

January 4, 1982

planning principles. To allude to "past zoning errors" represents an opinion shared by some and rejected by others. The purpose of the subject EIS is to evaluate this particular project based on the existing conditions and present the facts accordingly. At present, there is a very limited supply of light industrially planned and zoned land available within windward Oahu. The proposed project is consistent with both planning and zoning. Your supposition that the proposed project is inconsistent with the proposed Development Plans is not correct.

Traffic

The Draft EIS contains a specific section to address traffic impacts. This analysis was preliminarily discussed with the State Department of Transportation. We have specifically indicated there will in all probability be a need for highway improvements to facilitate ingress and egress to the site.

Water

The Draft EIS states that project implementation is contingent upon providing adequate source development and water transmission for both domestic and fire protection. A water master plan must be developed and approved by the Board of Water Supply to insure your basic concerns are achieved. Without such a plan, the project cannot commence. The Draft EIS further states that the development of a potential source, once specifically located, may require a separate EIS, of which emphasis will be placed on the impact on farming. The approval of this latter EIS does not grant any permit to allow development.

Sewage

A specific plan for sewage disposal must be preliminarily reviewed and approved prior to submittal of an application for a Special Management Permit. Two proposed alternatives have been presented and analyzed in the Draft EIS. One of these methods will ultimately be selected.

Your review comments and our response will be incorporated into the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dal Bay*  
for Brian L. Gray

DB:SC  
copy: Cowell & Co., Inc.

988



GEORGE R. ARIYOSHI  
GOVERNOR



Date Received DEC 23 1981

File: JACK K. SUWA  
CHAIRMAN, BOARD OF AGRICULTURE

To: DB

Action: \_\_\_\_\_

State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 So. King Street  
P. O. Box 22159  
Honolulu, Hawaii 96822

December 22, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, HI 96813

Dear Mr. Bills:

Draft Environmental Impact Statement  
Proposed Kahului Industrial Project Development  
TMK: 4-7-13: 1, 10, 11, 12, 16, 24

The Department of Agriculture has reviewed the subject Draft Environmental Statement and offers the following comments. These comments, however, are not statements for or against the project itself. We reserve the right to address this issue at a later date.

There is no discussion of the water requirements for taro production or aquaculture. The EIS merely states on page 66 that: "the water requirements for taro production or aquaculture are prohibitive to make this alternative attractive." We believe there should be information to explain this statement, since the area is a wetlands area with a stream flowing into a marsh on the subject property ("Wetlands and Wetland Vegetation of Hawaii" by Margaret E. Elliott and Erin Marie Hall, September 1977, part of XI-A17 of Draft EIS and the land has been historically used for growing taro (page 36 of Draft EIS).

The Draft contains repeated statements that agriculture is not an economically viable alternative for the sites; however, there are no figures to substantiate this claim. The market study which appears in Appendix I does not consider the agricultural alternative. The conclusion of the lack of economic viability of agriculture may result from the fact that the land was previously purchased at a price anticipating its subsequent urban use, which is supported by the following statement which appears on page 21:

"Alexander & Baldwin, Inc. acquired this property in March 1971. The intent of this purchase and subsequent payments of real property taxes were based on planned development conforming to the existing zoning and General Plan designations of the site."

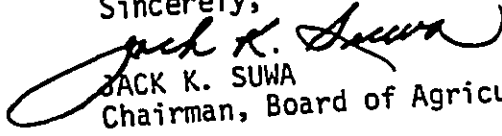
*"Support Hawaiian Agricultural Products"*  
XI-A17

Mr. David Bills  
Page - 2 -  
December 22, 1981

The Development Plan which was approved by the City Council designating the site as industrial has subsequently been vetoed by Mayor Anderson. Since the City Council sustained the veto of the Development Plan for Koolaupoko, the question is not resolved as to whether the site will be designated industrial or agricultural and preservation as shown in earlier drafts of the plan.

Thank you for the opportunity to comment.

Sincerely,

  
JACK K. SUWA

Chairman, Board of Agriculture

cc: Mr. Michael M. McElroy, Director  
Department of Land Utilization

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Jack K. Suwa, Chairman  
Board of Agriculture  
Department of Agriculture  
1428 South King Street  
P.O. Box 22159  
Honolulu, Hawaii 96822

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Suwa:


Thank you for your Draft EIS review comments. In response to your concerns for quantitative analysis of agriculture options for the project site, the Revised EIS contains Appendix J - Agricultural Feasibility. This study is attached and concludes that "the project site is infeasible for agricultural production, both with respect to ecology and economic feasibility."

We concur with your conclusion that the matter of an appropriate Development Plan designation for the area is, at present, unresolved. It further appears that the earliest the plan will be available for review is March, 1982. At present, the DLUM designation of light industrial and residential are still the standard with respect to the General Plan. The Revised EIS has been amended to state the current status of the general planning designations.

We appreciate your review and reply on the Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

  
for Brian L. Gray

DB:sc

Enclosure: Agricultural Feasibility Study  
copy: Cowell & Co., Inc.

988

GEORGE R. ARIYOSHI  
GOVERNOR



STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
850 HALEKAUWILA ST.  
ROOM 301  
HONOLULU, HAWAII 96813

Date Received DEC 24 1981  
File: \_\_\_\_\_  
To: DB  
Attention: \_\_\_\_\_

George Yuen  
Director  
TELEPHONE NO.  
548-6915

December 21, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Subject: Environmental Impact Statement for the proposed  
Kahaluu Industrial Project Development

We have reviewed the subject statement and offer the  
following comments:

We note that the statement has been filed pursuant to  
Ordinance 4529 as amended and not under Chapter 343, HRS.  
Since the project proposes the use of lands within the  
shoreline setback area, and may also involve the use of  
submerged lands within the conservation district (for flood  
control channel) the requirements of Chapter 343, Hawaii  
Revised Statutes apply. Therefore, we recommend that the  
project be assessed pursuant to Chapter 343, HRS and the EIS  
Regulations. Until such time as this is completed, the  
statement on page 26 concerning compliance with Chapter 343,  
HRS will be considered incorrect and misleading.

Page 11. The proposal includes the filling of the site  
approximately eight (8) feet above its present elevation.  
The location of the source of the fill is not disclosed. The  
amount of fill required for this project is also not stated.  
We recommend a discussion of the source of the fill, its  
characteristics, amount and impacts associated with its removal  
from the borrow area.

The drainage improvements section should indicate that a  
concrete lined channel from Kamehameha Highway to Kaneohe  
Bay is being proposed. We note that the assumption is made  
in the drainage study that the property to the North of the  
North Waihee Stream could also be developed. A discussion is  
recommended on what the drainage/flooding situation will be  
if that land North of the North Waihee Stream is not developed.  
There should also be a discussion of the existing stream fauna  
and the environmental impacts, if any upon that fauna.

Mr. David Bills  
December 21, 1981  
Page 2

Page 27. The statement should be added that the draft development plan for this area was vetoed by the Mayor and sustained by the City Council.

Page 33. It is not clearly stated in the section on Economic Uses whether or not this project is coastal dependent and should be permitted within the special management area. A discussion is recommended.

Page 45. As discussed above, it would be incorrect to state that the project is generally planned for industrial use.

Page 47. The eventual construction of buildings on the makai side of the highway will probably not increase the aesthetic values of Kaneohe Bay.

Page 51. The reasons for assuming that the traffic will grow at a constant rate of 8% to the year 2000 should be given.

Page 57. It is stated that storage of the sewage effluent will have to be great enough to eliminate its use of irrigation during wet weather periods. Please define wet weather periods.

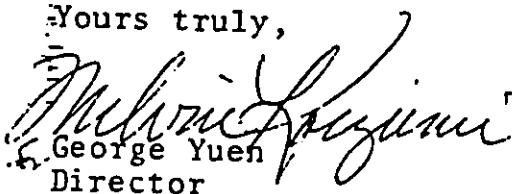
Page 66. The statement is made that the water requirements for aquaculture are prohibitive to make this alternative attractive. We cannot find anything in the statement to support this assertion. The location of the project next to Kaneohe Bay may make this area suitable for certain types of aquaculture. An expanded discussion on this topic is recommended.

Page 73. It should be clearly stated in this section that the implementation of this project will remove the site from possible use for taro production and that the wetland will be destroyed.

Page 5 of the drainage study. It is not clear whether the proposed channel will go below the high water mark of Kaneohe Bay. If it does, the use of State-owned conservation district lands should be discussed.

Thank you for allowing us to review this statement.

Yours truly,

  
George Yuen  
Director

cc: Michael M. McElroy, Director  
Department of Land Utilization

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. George Yuen, Director  
State of Hawaii  
Office of Environmental Quality Control  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Yuen:

We have received your comments of December 21, 1981 on the above-mentioned project. We would like to provide the following responses to your concerns:

1. For your information, the statement was filed pursuant to Ordinance 4529, as amended, as it was initially determined by the Department of Land Utilization that the project site is located within the SMA. Ordinance 4529 states that a Special Management Area Use Permit (SMP) Application must be submitted to the Department of Land Utilization prior to the implementation of the proposed action. An accepted Revised EIS is required as a part of the SMP application submitted. Ordinance 4529 further states that Chapter 343, HRS and the EIS Regulations specify guidelines which must be met in order for the accepting agency to accept an EIS. It is our understanding that irregardless of the class of action, be it the use of lands within the shoreline setback area (drainage improvements to the North Waihee Stream channel), submerged lands within the conservation district (for flood control channel) or the use of lands within the SMA, the EIS will satisfy the requirements of Chapter 343, HRS. To rectify any possibility of misinterpretation, the statement on page 26 of the Draft EIS will be changed to: "This EIS will address the above-mentioned concerns and mitigating measures as the project is assessed pursuant to Chapter 343, HRS and the EIS Regulations, as directed by Ordinance 4529."

2. It is difficult to locate the proposed borrow site at this preliminary stage. The Draft EIS identified the most likely and abundant fill material available within windward Oahu. Two potential sites are available on Ahuimanu Road. The borrow site for any potential fill is controlled through the City and County of Honolulu Grading Ordinance. The amount of fill required for this project is quantified in Section II.C.1.a - Grading of the Revised EIS.

January 4, 1982

3. As suggested, the drainage improvements section will include a summary of the two drainage alternatives for the proposed project, including the alternative of a lined channel from Kamehameha Highway to Kaneohe Bay.

There are no commitments or definite proposals with respect to the property to the North of North Waihee Stream. The opposite bank area is within Zone A of the Federal Flood Insurance Rate Maps. The opposite property must fill to allow structures if structures are proposed at some time in the future. If no improvements are ever contemplated, then the area will continue to be subject to flooding as presently occurs. Alternative No. 1 of the Preliminary Drainage Study poses no improvements to the existing inadequate box culvert under Kamehameha Highway at North Waihee Stream. If no improvements occur on the opposite bank of North Waihee Stream and the project site is filled, there will be an increase in flooding on the adjacent land, but the increase will not significantly elevate the 100-year flood inundation level. The second alternative involves the improvement to the existing box culvert under Kamehameha Highway. This alternative will reduce the 100-year flood inundation level on the adjacent parcel as compared to existing conditions.

4. We appreciate the information provided. This information will be incorporated in the Revised EIS.
5. It must be reiterated that the zoning designation for the makai portion of the project site is predominantly I-1 Light Industrial. The proposed action is consistent with the existing zoning of the site. As illustrated in Table 1 of the Draft EIS (page 6), there are a number of types of permitted uses for light industrial subdivisions. Some of these uses, such as eating and drinking establishments may be coastal oriented; however, at this stage, no restrictions on types of use have been committed by Alexander and Baldwin, Inc.
6. The Detailed Land Use Map (DLUM) of the General Plan designates the site Light Industrial. We do not concur with your statement regarding general planning.
7. We concur that the claim of positive effects is a subjective determination. The statement in question (page 47) will be deleted from the text of the Revised EIS. Site plans and landscape plans will be developed for the Special Management Area Permit application in conformance with the conceptual plans presented in the EIS.
8. The reason for assuming that the traffic will grow at a constant rate of 8% to the year 2000 is that this assumption was detailed in the accepted EIS, "Environmental Impact Statement, Kahaluu Commercial & Residential Development."
9. We concur with your suggested change in wording. In the Revised EIS, the statement in question will be changed to read, "In addition, a

Mr. George Yuen

- 3 -

January 4, 1982

holding tank (250,000 to 500,000 gallon capacity) will be installed to eliminate the necessity of irrigation during days of heavy rainfall."

10. Water requirements for agricultural use of the subject land are a concern. We are attaching an agricultural feasibility study for the area. While the agricultural feasibility study does not specifically address aquaculture, we anticipate the results of an aquaculture study would probably be unattractive. If there was a real interest for aquaculture on the site, a study would be merited. However, we are not aware of any realistic concerns to attempt or consider aquaculture in this area. The forgoing agricultural feasibility study will become part of the Revised EIS.
11. We agree with suggested additions to this section. These additions will be added to Section IX - Any Irreversible and Irretrievable Commitments of Resources of the Revised EIS.
12. It is not known at this time whether the proposed channel will go below the high water mark of Kaneohe Bay. A certified shoreline survey will accompany the SMP application. If it is determined that use of State-owned conservation district lands is involved, then a Conservation District Land Use Permit (CDUA) will be sought.

We appreciate your review and comments on the Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

D. L. Gray  
for Brian L. Gray

DB:vs:sc  
Enclosure: Agricultural Feasibility Study  
copy: Cowell & Co., Inc.





Date Received DEC 24 1981

File: \_\_\_\_\_

To: DB

Action: \_\_\_\_\_

# University of Hawaii at Manoa

Environmental Center  
Crawford 317 • 2550 Campus Road  
Honolulu, Hawaii 96822  
Telephone (808) 948-7361

December 21, 1981

RE:0343

Office of the Director

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

## Draft Environmental Impact Statement Proposed Kahaluu Industrial Project Development Kahaluu, Koolaupoko, Oahu

The Environmental Center has reviewed the above cited EIS with the assistance of Yu-Si Fok, Civil Engineering, and Jacquelin Miller, Garret Kawamura, and Robert Rowland, Environmental Center. Our comments on the document follow.

The draft EIS is a voluminous document containing copious amounts of correspondence and appendices covering specific topics of potential impact. This background and supportive material forms approximately 75% of the total document. Unfortunately, the basic text of the DEIS does little to address the relevance of this background material to the identification and evaluation of the specific impacts which will be generated by the project and the concerns expressed in the correspondence supplied during the preparation stage.

We appreciate the intent of the drafters of the document to provide substantial background information. However, we find that much of the information and text is purely descriptive and little analysis is presented as to the relevance of the information in identifying and evaluating the 5 or 6 major areas of concern such as erosion, drainage, sewage disposal, water availability, traffic and social-economic considerations.

The following specific points have been identified by our reviewers.

### p. 11 - Grading

The statement on page 11 and in Appendix B indicate that the 26-acre site will be filled to improve drainage and elevate the site out of the flood plain. The final EIS should elaborate on the impacts (dust, water quality) from allowing the fill material to settle one to three years before improvements begin. Will this fill material be any more suitable for agriculture than the present soil? This question is referred to, but not specifically addressed on p. 37.

AN EQUAL OPPORTUNITY EMPLOYER

XII - A/1

p. 11 - Drainage

"Typically, lots will be drained toward the roadway by surface swales."

Will surface swales exist after the site is graded, filled, and leveled? If not, how will lots be drained?

p. 14 - Roadways

"The project may also require improvements to Kamehameha Highway to provide storage lanes (left-turn from Kamehameha Highway into project), an acceleration lane and a deceleration lane."

If required, where will these improvements be located? Will a map with this information be included in the final EIS?

p. 15 - Water Supply

"Unlike the Pearl Harbor basin and Honolulu which lack excess water resources, there is additional water available within Windward Oahu which has not been developed as a source of water supply."

Is it logical to separate Windward Oahu from the rest of the island when the water system for the entire island is inter-connected?

p. 15 - Sanitary Sewage Disposal - Alternative no. 1

"Collect and transport all sewage to the Ahuimanu Sewage Treatment Works... The proposed Kahaluu Residential and Commercial Development located just south of the Kahaluu Industrial Project also proposes this method of sewage treatment and therefore, it may be possible that both projects utilize the same force main."

The suggestion is made that the collective developments recently proposed for Kahaluu should consider a joint development of a sewage force main. It should be noted that extending a major sewage force main into a predominantly rural, agricultural community is the type of project that one would expect to have major significant impacts. Regardless of the zoning designation, any property serviced with sanitary sewage disposal by a municipal system will experience pressure for development. This type of infrastructure provision is of such a magnitude that a full environmental analysis of this option would be necessary if it is to be considered a viable alternative for waste disposal. In accordance with Chapter 343, the cumulative impacts of such an action need to be fully addressed in this EIS.

The feasibility of Alternative 2 for sewage treatment should be reevaluated. Our reviewers share the concerns in this regard with those expressed in the comments submitted by the Water Resources Research Center.

Mr. David Bills

-3-

December 21, 1981

p. 36 - Physical Geography

"Should effluent from an on-site sewage treatment plant be utilized, the rear portion of the property (R-3 residential section) could most likely support a commercial nursery or other agricultural uses."

Does this imply that unless on-site effluent is recycled, agricultural activities can be ruled out on the project site?

p. 39 - Groundwater Quality

"It is believed that the impact of the proposed project on the ultimate groundwater supply will not be significantly adverse since it is generally known that Windward Oahu has additional source development potential that will sustain a majority of growth on both Windward and Leeward Oahu."

The wording of this section is at best confusing. We assume that it means that it is considered that satisfaction of the water demand of the project will not significantly reduce the excess of the sustainable yield of the island's groundwater resources over the current draft.

However, the DEIS continues:

"However, if it is determined that adequate water is not available this impact will be significantly adverse to curtail and foreclose the proposed project."

This further wording also is confusing, but if it means that the project would be carried out even if adequate water were unavailable, as it seems to mean, we question its validity.

p. 42 - Noise

"The proposed project will increase the ambient noise level. However, the increase will generally be greatest during the working day since the industrial subdivision will achieve peak activity during normal working hours."

The fact that most noise will occur during the day does not mitigate its impact, if any, on the community. What will be the impact of noise from the proposed project and who will be affected?

p. 42 - Climate

"The proposed project is anticipated to have insignificant impact on the existing climatic conditions."

This statement should be deleted unless some rational explanation is provided for its basis otherwise it only adds bulk and no substance to the document. As indicated

earlier, there is a frequent lack of recognition, analysis, or evaluation of the background data in the development of the text of the DEIS. For example average annual precipitation is cited as "approximately 44 inches of rain" (p. 42) yet in Appendix D (p. 20) a figure of 60 inches per year is cited. Such inconsistencies lead to the appearance that the EIS text was compiled without cognitive evaluation of the support studies.

p. 43 - Fauna

"As the site contains only non-native fauna, the proposed project will pose no impact on endangered species. No structures are proposed to be built in the waters of Kaneohe Bay or within the Shoreline Setback Area, with the possible exception of drainage improvements to the North Waihee Stream channel."

Why is the discussion of structures included in the paragraph in fauna?

p. 43 - Flora

"In general, because of the highly modified character of the project site and because none of the biota are considered to be endangered, the impact of removal will not be significant."

This statement is highly misleading. What about the greater erosion potential of a site that has been stripped of all vegetation? What effect will this erosion prone surface have on the sediment transported to Kaneohe Bay? Removal of vegetation can have highly significant impacts regardless of the species involved.

p. 45 - Archaeology

The archaeological reconnaissance was clearly limited in its efficacy due to dense vegetative cover and the wetland condition on much of the site. The DLNR letter responding to the EIS preparation notice summarizes many of our concerns. We suggest that the Bishop Museum be contacted by the applicant prior to any site alterations so that the necessary sub-surface surveys can be made and advice obtained concerning procedures to be followed during site preparations.

p. 47 - Aesthetics and Viewplanes

The second half of the first paragraph on p. 47 is quite confusing and of questionable logic. The attribution of positive impacts to the removal of vegetation from the Makai view plane and replacement with structures is surely one subject to some differences of opinion. There are rather many who would question the interpretation of "positive impact" of replacing a view of vegetation with a view of structures. We recognize that the attribution of this "positive impact" is a subjective determinative and hence we can claim no particular expertise in this interpretation. We do suggest however that this paragraph as presently worded is confusing in its content and organization and should be reexamined in the final EIS.

p. 51 - Traffic

It seems obvious from the capacity figures given for Kamehameha Highway and the timetable for construction of the sub-division that the proposed project will have a definite negative impact on the traffic situation in Kahaluu on both Kam and Kahekili Highways. If the highway will be inadequate after 1990 and the earliest that construction can begin after settling of the fill material is 1985-86, then it would be virtually impossible for the highway to ever have sufficient capacity to accommodate the proposed project except in the construction phase.

The basis for the assumptions referenced in the second paragraph on p. 51 should be included in the final EIS. In general, use of existing adequate data and previous studies which are applicable is to be encouraged. However, in this case the Traffic Impact Study prepared for the Market City Ltd. development did not address nor mention the Kahaluu Industrial Project. The Market City traffic study also employs the same questionable growth assumptions contained in this section of the DEIS.

p. 61 - Socio-economics

Judging from the letters submitted during the EIS preparation stage, the social-economic impacts are perceived by the Kahaluu community as the major (not secondary) impact of this project.

An expansion of this section should be considered with substantive data on the specific social and economic changes which will result. For example:

"Aside from the direct social implications on public services, indirect and secondary effects include changes in lifestyle and land use."

What are the economic implications on public services?

What is the difference in meaning of the terms indirect and secondary?

What are the "indirect and secondary effects" of the proposed project including the changes in lifestyle and land use mentioned?

"The development of the proposed project will change the topography and therefore make it more difficult for present residents and future generations to study the history of the region."

The intent of this statement is unclear. Why should the development hinder the study of history of the region? If there are archeological sites on the property then these must be evaluated prior to development to determine if development should be permitted and if so under what conditions. The text statement as presently worded is illogical.

"Economic impact of the proposed action will be both short and long-term. Projected construction costs for the project have been estimated at 5.0+ million dollars, the majority of which can be expected to be spent on local labor, materials, equipment and

Mr. David Bills

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December 21, 1981

supplies. Revenue will be generated for the government through taxation of the wages and materials used."

Where is the discussion of these short and long-term economic impacts?

Will costs incurred to government from provision of services, road repairs after construction, and other government functions performed in relation to the proposed project be discussed in the final EIS along with the revenue to be generated from taxing wages and materials used? This section as presently drafted contains no substantive information upon which an informed evaluation of the economic impact can be determined.

"After its completion and occupation, the project will not change the overall regional pattern of employment, such as commuting to Kaneohe Marine Corps Air Station-Pearl Harbor-Honolulu."

What is the basis of this statement?

"The economic impact of the proposed action is expected to be positive, as there will be a substantial increase in income generated from the project site. Future sales, income and real property taxes are anticipated with the development."

The final EIS should identify both the positive and negative impacted groups.

p. 79 - Summary of Unresolved Issues

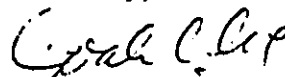
3. "However, opposition from a portion of the community should pose no overriding reason for not proceeding with the proposed action."

The conclusion expressed in this statement applies only to the developer or a project. If a significant portion of a community is in opposition to any project their concerns must surely be taken into consideration by the public regulatory or governing bodies in any decision making process affecting their community.

Reference should be made to p. 22 where the State Plan policy on Scenic, Natural Beauty and Historic Resources is cited. It seems clear that the Kahaluu Neighborhood Board is doing just as the policy states by protecting a special area and elements that are integral to their cultural heritage and present lifestyle.

We appreciate the opportunity to have commuted in the DEIS and look forward to receiving your response to our concerns.

Yours truly,



Doak C. Cox  
Director

cc: Department of Land Utilization  
Yu-Si Fok  
Jacquelin Miller  
Garret Kawamura  
Robert Rowland

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Doak C. Cox, Director  
Environmental Center  
University of Hawaii at Manoa  
2550 Campus Road  
Honolulu, Hawaii 96822

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Cox:

We have received your review letter to the subject Draft EIS. We are providing the following responses to your specific concerns:

1. p. 11 - Grading

Other than the immediate impacts of exposed earth surfaces during actual grading operations there are minimal dust and water quality related impacts anticipated during the settlement period other than presented in the Draft EIS. For clarification, once mass grading is completed vegetation in the form of rye or bermuda grass must be planted and sustained for the settlement period. The grassed surfaces will provide soil retention and inhibit dust. Since the project site is in excess of 15 acres, the City and County's Grading Ordinance specifies incremental grading with planting of vegetal cover prior to opening subsequent increments. These procedures are specifically outlined in the City and County's Grading Ordinance referenced in the text.

With respect to the suitability of the land for agriculture, it is immaterial whether the land is in its existing condition or proposed fill condition. Agricultural operations can theoretically be achieved under either condition. However, under either condition, the practical and economic feasibility of agriculture is not viable. To this end and as a result of other review comments, Appendix J - Agricultural Feasibility Study has been added to the Revised EIS. The study concludes that under existing or fill conditions agricultural production is infeasible. We have attached a copy of this appendix for your review.

2. p. 11 - Drainage

We do not understand your comment. The Draft EIS specifically states that lots will be drained toward the roadway by surface swales. For clarification, this means finished lots after grading is completed.

January 4, 1982

3. p. 14 - Roadways

A left-turn storage lane may exist from the project entrance and extend in a southerly direction within a center-median strip of Kamehameha Highway. The purpose of this lane is to store cars which will make left turns entering the project from Kamehameha Highway and not impede through traffic. An acceleration lane may be created within the mauka shoulder of Kamehameha Highway to allow traffic to slow down and enter the project outside of the through traffic lane. Finally, a deceleration lane may exist in the mauka shoulder of Kamehameha Highway and extend in a southerly direction from the project entrance to allow vehicles egressing from the site to gain speed and merge with through traffic. Generally these terms are self-explanatory; however, we have clarified them for your review. We have not added a map to the Revised EIS.

The foregoing projected highway improvements were discussed with the State Department of Transportation during the consultation stage.

4. p. 15 - Water Supply

The Board of Water Supply has divided the Island of Oahu into districts with different classifications with respect to adequacy of existing sources, adequacy of potential sources and the adequacy of the existing transmission system. There are multiple districts within the same interconnected system. We therefore believe it is appropriate to distinguish a difference between source development on Windward and Leeward Oahu.

5. p. 15 - Sanitary Sewage Disposal - Alternative No. 1 and No. 2

With respect to extending a major sewage force main into Kahaluu, such action has been planned by the City and County of Honolulu. In fact, the Kahaluu Sewage Pump Station (SPS No. 3) is scheduled to be completed by mid-1984. As indicated in the attached Department of Public Works comment letter, the adjacent Market City Residential and Commercial Development proposes connection to this pump station. Joint connection is a logical approach to the master-planned utility. Both connections are subject to a preliminary engineering report which must address various considerations such as existing treatment plant capacity, future treatment plant capacity and preliminary design of proposed force main and gravity sewer. The preliminary engineering report must satisfy the requirements of the Design Standards of the Sewer Division. If design requirements cannot be satisfied, connection will not be allowed.

In summary, we would like to emphasize that the preliminary proposed force main connection does not represent a unique or new idea, but rather one that is already master-planned.



January 4, 1982

With respect to the feasibility of Alternative No. 2 we have attached a copy of our response letter to the Water Resources Research Center.

6. p. 36 - Physical Geography

Your assumption is correct. No agricultural activities are proposed unless it is necessary and feasible to dispose of treated effluent on-site. At present, the preferred method of sewage disposal is off-site via connection to the Ahuimanu STP.

7. p. 39 - Groundwater Quality

We will attempt to reword and eliminate apparent confusion for your reviewers. We are in essence stating as a matter of generally observed fact there are additional groundwater reserves available within windward Oahu which can be tapped to serve the project and not significantly or substantially change the water budget. We are further purporting that as a matter of generally observed fact, an additional source development will not substantially or significantly alter existing water supply characteristics. However, the burden of proof lies on the developer and his consultants to substantiate this claim through preparation of a water master plan as well as source development. If this claim cannot be substantiated to the satisfaction of the Board of Water Supply's requirements, the project cannot proceed.

In conclusion, we would like to emphasize there is no feasible way the project can proceed without verification of what we have considered generally observed facts.

8. p. 42 - Noise

Your reviewers have implied that since the greatest increase in noise levels will occur during the day that this in fact represents a mitigation measure. Upon re-examination we believe you will find that no such statement has been made. However, since it is reported that ambient noise levels will increase, we believe it is preferable to have the increase during working hours (8 a.m. - 5 p.m.) than non-working hours.

Based on a wide variety of permitted uses within I-1 zoning districts, it is difficult to exactly and even generally predict the impact of increased noise above ambient conditions. It is clear that Public Health Regulations, Chapter 44-A and 44-B establish standards to control noise and that these standards have been derived based on reasonable criteria. In addition, the Comprehensive Zoning Code establishes maximum noise levels with specific reductions when industrial development is adjacent to residential development. It is a clear intent that noise generated within and as result of the project comply with all laws concerning noise.

January 4, 1982

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Mr. Doak C. Cox

9. p. 42 - Climate

We do not concur with your conclusion that it is inappropriate to state that "the proposed project is anticipated to have insignificant impact on the existing climatic conditions."

The Revised EIS will be amended to include a change in annual rainfall. Sixty (60) inches will be the figure cited.

10. p. 43 - Fauna

The statement regarding structures implies that physical improvements will not encroach into the coastal water environment.

11. p. 43 - Flora

The statement regarding flora is not misleading. Please read the following sentence which clearly states that the associated impact on filtering ability was discussed within Section IV.A.3 - Surface Water Quality.

12. p. 45 - Archaeology

We are enclosing DLNR's response letter which states "the archaeology survey is useful and no further archaeological work appears to be needed." We are further proposing to comply with DLNR's request to have an archaeologist available and to contact DLNR if any unanticipated additional artifacts are found.

13. p. 47 - Aesthetics and Viewplanes

We are eliminating the last sentence under this section which states "eventual construction on the makai section will remove the visual barrier of the vegetation and may therefore have a positive impact on the aesthetic values of Kaneohe Bay." This should eliminate confusion and the questionable logic.

14. p. 51 - Traffic

We believe the traffic analysis as presented is relatively accurate. Further, the Department of Transportation has not raised any of the particular concerns which have been incorrectly alluded to in your comments. To reach the conclusion that Kamehameha Highway has insufficient capacity is not correct. The peak hour traffic period will extend to accommodate additional traffic capacity.

The Traffic Impact Study for the Kahaluu Commercial and Residential Development does address the Kahaluu Industrial Project. Please review the assumptions for the Traffic Projections presented in Table 4 and also in Appendix H. We believe your review will find that growth projections are based on cumulative development of the whole windward area which includes the industrially-zoned project

#### ADDENDUM

The Revised EIS for the Kahaluu Industrial Development, as described herein, proposes four (4) industrial subdivision lots makai of Kamehameha Highway. By means of this addendum, it is intended to modify the Revised EIS to delete all references to four (4) industrial subdivision lots in favor of one (1) industrial subdivision lot described in total by TMK: 4-7-13:1.

For the purpose of additional clarification, it is intended the industrial zoned area on the makai side of Kamehameha Highway be developed and analyzed as presented with the Revised EIS with the exception that no property lines will be created. The use of the makai lot will be Light Industrial (I-1) as defined by the CZC and presented within the Revised EIS. Ownership after development will either be by lease or by deed subject to market study determination as also referenced in the Revised EIS.

January 4, 1982

area. Assumed growth rates are in excess of that which has occurred over the last four year. We are sure that you will concur that development over the last four years has been remarkable and occurred over a period of economic prosperity.

15. p. 61 - Socio-economic

We concur that the most significant unresolved issue regarding the proposed project is related to planning for the windward area. The Kahaluu Neighborhood maintains that the proposed project is inconsistent with the Hawaii State Plan and the City and County's General Plan and cites one of the policies as the basis for this position. However, the Hawaii State Plan as well as the General Plan contain numerous policies and objectives covering a wide spectrum of considerations. Some policies and objectives as presented in the Draft EIS favor industrial development, while other policies and objectives as presented by the Kahaluu Neighborhood Board's consultation and review comments oppose development.

We believe it is an impossible task to clearly and unequivocally demonstrate that the project complies with all policies and objectives or is out of compliance with all policies and objectives. It is more appropriately a weighing process.

Your review letter specifically asks for expansion on the economic implications with respect to public services. Through the review letters from agencies directly associated with public services, your request has been partially satisfied. We are attaching the Department of Education and Police Department review letters. With respect to utilities such as water, sewer and electric, these utilities are master-planned utilities and the general growth patterns have already been established. The proposed Kahaluu Industrial Development will not significantly alter these master-planned utilities.

Your response letter specifically asks for the difference between indirect and secondary effects. For the purpose of your direct reference, there is no difference between indirect and secondary.

Your response letter further questions whether development will alter the study of history in the area. For clarification, even though an archaeological reconnaissance for clearance has been conducted, it is an impossible task to recover all archaeological features. However, a certain amount of work must be done to ascertain the likelihood of a site producing significant archaeological finds. We still believe that once the site is altered, the ability to study history becomes more difficult. A grand scale analogy which may emphasize the intent of this section has occurred in Waikiki. Waikiki was once the site of an extensive marsh and rice production. However, in its present fully developed condition the ability to study the past conditions is altered. With respect to the Waihee Marsh area, the same result will occur. However, the loss is not considered unique or significant.

January 4, 1982

The Draft EIS discusses short and long-term economic impacts. Short-term impacts are related to construction while long-term economic impacts are related to taxes, wages and the general trade established through the project.

The Revised EIS will not contain any particular discussion on the costs to government from the provision of services and road repairs. For your information, taxes are assessed for the purpose of providing these services. We believe this is a generally understood principle, of which your office is the only review agency which requested additional information.

The basis of the Draft EIS statement regarding regional employment patterns is a general statement summarizing the socio-economic considerations of the project. For clarification, it is not believed that the proposed project will significantly alter regional employment. A substantial number of employees will rely on the existing urban districts such as Kaneohe town, Kailua town, Kaneohe Marine Corps Air Station and Honolulu. Since the project cannot significantly change the existing pattern of employment, it is doubtful whether the project can significantly change the cumulative socio-economic structure of the region.

Your review comment letter asks for identification of the negative as well as positive economic impacts. From an economic perspective the project will provide growth. From an economic perspective, this can only be considered positive. We believe your request to illustrate negative economic impacts refers not to economic considerations but to the related socio-economic impacts. The socio-economic section discusses the Kahaluu Neighborhood Board's position for retention of a "rural" lifestyle. Any potential change to this character is considered negative by the Board.

16. p. 79 - Summary of Unresolved Issues

Your conclusion that public opposition by itself is significant enough by itself to curtail further proceedings is not correct. However, we do concur that public regulatory or governing bodies have an obligation to weigh all facts in making decision. The Kahaluu Neighborhood Board's opposition to the project is in direct opposition to existing planning (Detailed Land Use Map) and zoning. We further believe this fact must be carefully weighed by public agencies when determining the validity of public opposition. It is further stated that planning considerations are the main unresolved issue.

Mr. Doak C. Cox

- 7 -

January 4, 1982

We thank you for your review comments. Your comments and our response will become a part of the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

*Dal B...*  
for Brian L. Gray

DB:sc

Enclosures: Agricultural Feasibility Study  
Dept. of Public Works letter  
WRRC letter  
DINR letter  
DOE letter  
Police Department

DEPARTMENT OF LAND UTILIZATION  
**CITY AND COUNTY OF HONOLULU**  
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813 • (808) 823-4432

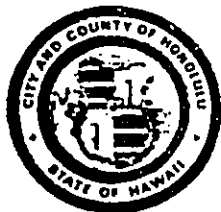
Date Received DEC 24 1981

File: \_\_\_\_\_

To: DE

Action: \_\_\_\_\_

EILEEN R. ANDERSON  
MAYOR



MICHAEL M. MCELROY  
DIRECTOR

ROBERT B. JONES  
DEPUTY DIRECTOR

81/SMA-108)SM)

December 22, 1981

Mr. David Bills  
Gray, Hong and Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Dear Mr. Bills:

Draft Environmental Impact Statement  
Proposed Kahaluu Industrial Project Development  
Tax Map Keys: 4-7-13: 1, 10, 11, 12, 16, 24

We have reviewed the above and have the following comments to offer:

1. Reference: Page 15.

Comment: Does the Ahuimanu Sewage Treatment Plant have adequate capacity to accommodate the sewage to be generated by the proposed project? This discussion should include the existing amount of sewage being processed daily, the remaining capacity, and the generation of sewage from other proposed projects (Kahaluu Commercial and Residential Development, Paradise Village etc.). Consultation with the City and County Department of Public Works is suggested.

2. Reference: Page 27.

Comment: The Development Plan for Koolaupoko has not been adopted by the City Council, as of the date of this letter.

3. Reference: Page 22.

Comment: No mention in Section III (Land Use Plans, etc.) is made of the possible requirement for a Department of the Army Permit, under Section 404 of the Federal Water Pollution Control Act Amendments of 1972. This specifically addresses the issue of disposal of dredged or fill material into wetlands. Our preliminary contact with the U.S. Army Corps of Engineers (COE) indicates that this may be required. Therefore, contact with the COE is recommended.

4. Reference: Page 36, Appendix B - Preliminary Drainage Study.

Comment: Nowhere in the discussion of Physical Geography or Soils is the topography (contours or elevations) revealed. Therefore, in the discussion of drainage, it is not known from what elevation the site will be filled.

The Drainage Study should quantify the amounts of fill for each alternative and show on a map where this fill material will be placed.

We are greatly concerned about the impacts of filling in the wetland area and the impacts to the surrounding area. Will flooding be incurred on adjoining lands, if they are not elevated also? Exhibit VI of the Drainage Study seems to imply that adjoining lands will have to be elevated to a height equal to that proposed for the project site. Will the developer bear the costs of filling adjoining lands to prevent any flood hazard? How will structures on adjacent lands be affected?

It was noted in the archaeological study that there were "60+ cm. of freshwater making it very difficult to walk through". This study was conducted in August, which is a drier month, with respect to rainfall. Therefore, greater amounts of water can be expected on the site, during wetter periods. This points to two conclusions:

- a. That there is a substantial wetland in the area, and
- b. There is a potential for flooding adjacent lands, if the site is elevated by grading. The extent of the wetland area on the project site should be mapped.

5. Reference: Page 55.

Comment: At the time of the Special Management Area Use Permit (SMP) Application, the exact method of sewage treatment and disposal must be specified, with preliminary approvals from the State Department of Health, and the City and County Department of Public Works.

6. Reference: Page 59.



Comment: We feel that the discussion related to the potential impacts of the proposed industrial area is inadequate. What will be the visual and sonic impacts of the development on the adjacent recreational area? Will discharges from the industrial area affect the recreational potential, i.e., fishing, netting and crabbing, of the City and County-owned land? Will the different land uses be compatible?

7. General Comment: It would be helpful to list on a separate page all necessary requests and approvals required by the various governmental agencies for the development proposal, i.e., Special Management Area Use Permit (SMP) approval - City Council; subdivision approval - Department of Land Utilization etc.
8. General Comment: A current certified shoreline survey will be required at the time an SMP is requested.
9. General Comment: The makai portion of the subdivision is subject to the Shoreline Setback Rules and Regulations. This should be added to Chapter III. "The Relationship of the Proposed Action to Land Use Plans, Policies, and Controls for the Affected Area." Shoreline Rules and Regulations prohibit construction within 40 feet of the shoreline.

If there are any further questions, please contact Sampson Mar of our staff at 523-4077.

Very truly yours,



MICHAEL M. McELROY  
Director of Land Utilization

MMM:sl

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
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DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Michael M. McElroy, Director  
Department of Land Utilization  
650 South King Street  
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. McElroy:

In response to your Draft EIS review comments, we are providing the following information:

1. The Draft EIS proposes two methods for sewage disposal. As per your response letter, your department requires preliminary approval regarding sewage disposal at the time the Special Management Permit (SMP) is submitted. To fulfill this requirement, a preliminary engineering report must be reviewed and approved by Public Works to allow use of the Ahuimanu STP. This report must establish the capacity of the Ahuimanu STP with respect to existing conditions as well as future growth in the area. Specific consultation with the Department of Public Works will be conducted.

The purpose of the Draft EIS is to establish the alternative methods of sewage treatment and explore the ramifications. The possibility exists that the detailed specific requirements of either alternative may become economically infeasible, and therefore curtail the proposed project. The economic considerations, however, do not substantially alter the technical and environmental considerations of either option and an assumption has been made that either option at this preliminary stage is feasible. The assumption that allows consideration of the Ahuimanu STP is that the project site falls within the Master Planned sewer area of Kahaluu and that the Kahaluu Sewage Pump Station is scheduled to begin construction in mid-1983.

In a logical sequence of events, the EIS is not specifically concerned with the detailed analyses necessary to gain a preliminary engineering approval as long as there is a reasonable basis to assume a connection can be made. However, once the EIS has been fully processed, the required engineering reports will be prepared to allow submission of an SMP application.

Mr. Michael M. McElroy

- 2 -

January 4, 1982

2. At the time the EIS was submitted, the City Council had approved the Koolaupoko Development Plan (which designated the subject site Industrial) and the plan was forwarded to the Mayor's Office for review. Subsequently, the Koolaupoko Development Plan and five other districts have been sent back to the Department of General Planning for reconsideration and possible modification. The Office of General Planning indicates that revised maps may be available by March, 1982. There is no Koolaupoko Development Plan available for review or enclosure within the Revised EIS. The Detailed Land Use Map (DLUM) presented on page 28 of the EIS is the legally enforceable planning map for the area. The Revised EIS will make reference to this fact.
3. Subsection H has been added to Section III and is for the purpose of discussing "Department of the Army Permit Considerations to Address Considerations of Section 404 of the Federal Water Pollution Act Amendments of 1972." The Corps of Engineers via their response letter to the Draft EIS has substantially altered their original considerations.
4. Your response letter expresses concern that it is not known to what elevation the site will be filled. However, Section II.C.1.a - Grading, specifically presents this information. The Drainage Study (Appendix B) also provides the required finished freeboard elevations. However, we have revised Figure 5 - Typical Sections through Proposed Project to additionally provide fill quantities.

The Drainage Study has been prepared to establish freeboard elevations and satisfy drainage considerations. While it is true that the freeboard elevations are critical to earthwork quantities, it is not appropriate to quantify earthwork within the Drainage Study. For this reason, earthwork has been quantified in Section II.C.1.a - Grading.

Your response letter expresses concern for flooding of adjacent land if the project site is filled. However, the Drainage Study establishes that under existing conditions the project site as well as adjacent lands up through Wailehua Road flood to a depth of 9 inches above Kamehameha Highway. Therefore, under any condition should development occur on adjacent land, there is a definite fill requirement.

The Flood Insurance Rate Map confirms this conclusion while the Preliminary Drainage Study establishes the 100-year flood elevation. Any potential development of the adjacent lands has a responsibility to fill above the 100-year flood elevation and therefore the cost would be borne by that developer.

Alternative No. 2 of the drainage report specifies installation of a new box culvert under Kamehameha Highway. Should this option be required, the flood elevation of the entire area up through Wailehua Road would be reduced at the proposed Kahaluu Industrial Development's expense.

XIII: 2.1

January 4, 1982

The location map as illustrated on Figure 1 generally defines the Waihee Marsh area. However, within the Revised EIS we have emphasized and specifically called out the marsh area. This information combined with the firm mapping delineates the existing area subject to flooding.

5. The exact method of sewage disposal with appropriate preliminary approval will be obtained prior to the SMP application.
6. Your response letter requested additional discussion of the visual and sonic impacts of the development on the adjacent recreational area. These areas of the Revised EIS will be expanded. However, the EIS has made an attempt to present the facts and intent of the project. With respect to visual impacts and compatibility, the Special Management Area proceedings must provide more detailed plans in the form of site plans, landscape plans and sections to expand on the facts and intents provided. We do not believe the Draft EIS is inadequate with respect to EIS requirements, however, we do believe the information within the EIS must be significantly expanded to satisfy the contextual requirements of an SMA application.

We have also attached the water quality consultant's response memorandum regarding the impact of industrial storm water discharge on coastal activities.

7. A separate list of approvals is contained within Section XII - List of Necessary Approvals as required by Section 1:42:0 of HRS Chapter 343 - EIS Regulations.
8. We concur that a certified shoreline survey will accompany the SMP application.
9. Section III.F. - Special Management Area has been revised to clearly indicate that a certified shoreline survey will accompany the SMP application and that the purpose of this survey is to satisfy Shoreline Setback Rules and Regulations. Shoreline Setback Rules and Regulations prohibit construction within 40 feet of the shoreline. This fact is also stated implicitly in the SMP Setback Requirements referenced in Section III.G. - Hawaii Coastal Zone Management (CZM) Program.

We thank you for your Draft EIS response comments. Your response letter, our reply to your letter and the foregoing referenced changes will all become part of the Revised EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

  
for Brian L. Gray

DB:sc  
Enclosure: Consultant's letter  
988

XII. 7.

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



Date Received DEC 21 1981

SUSUMU ONO, CHAIRMAN  
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU  
DEPUTY TO THE CHAIRMAN

File: \_\_\_\_\_

To: DL

Action: \_\_\_\_\_

DIVISIONS:  
AQUACULTURE DEVELOPMENT PROGRAM  
AQUATIC RESOURCES CONSERVATION AND RESOURCES ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 521  
HONOLULU, HAWAII 96809

December 21, 1981

Mr. David Bills  
Gray, Hong and Associates  
116 So. King St., Room 508  
Honolulu, HI 96813

Dear Mr. Bills:

We have reviewed the draft EIS for the proposed Kahaluu Industrial Project and have a number of comments to offer.

Shoreline Access

The draft EIS does not discuss any public access to and along the shoreline. The concern is that the project not impede public access to Kaneohe Bay.

Sewage Disposal

Two alternative methods are described. For either method, there should be proper mitigating procedures to prevent excessive nutrients, soils, construction debris and materials from entering the aquatic environment. Final selection of a disposal method should conform to applicable governmental rules and regulations.

Aquatic Life

The draft EIS should address the impact of the project on all aquatic life, not only freshwater fishes. We are especially concerned with marine and estuarine crustaceans (crabs and shrimps) and fishes (nehu, papio, barracuda, mullet, et al.) which usually inhabit "hau and mangrove" shorelines (mentioned on pages 30 and 32 of the draft EIS). Clearing and grading the hau and mangrove habitat may be inconsistent with Class AA water quality standards of the Department of Health. Class AA waters, such as Kaneohe Bay, are established for various uses including support and propagation of shellfish and other marine life.

Mr. David Bills  
December 21, 1981  
Page 2

Drainage

Appendix D addresses the impacts of the proposed drainage system. Among them was the need for erosion control during construction. We would therefore suggest the following precautionary and mitigating measures:


- 1) Scheduling site work for periods of minimal rainfall.
- 2) Replanting and recovering areas denuded of vegetation as quickly as possible.
- 3) Preventing construction materials and debris, petroleum products, landscaping chemicals and waste from falling, washing or leaching into the aquatic environment.

Archaeology

The archaeology survey is useful and no further archaeological work appears to be needed. However, current site conditions make fieldwork difficult and so a reliable assessment at this time is also difficult. Records show that numerous kuleanas were claimed in the project area in the 1800's, including the area makai of the highway. There is a good possibility that burials, Hawaiian stone tools, antique bottles and various kinds of stone alignments will be found during construction.

All approvals and permits for the proposed undertaking should be conditioned so that if any unanticipated sites or remains (such as historic bottle dumps, Hawaiian artifacts; shell, bone or charcoal deposits; human burials; basalt or coral alignments, pavings, or walls) are encountered, the contractor will contact our Historic Sites Section at 548-7460. If the remains are determined to be significant, emergency archaeological excavations should be conducted at the project site.

Sincerely,

  
SUSUMU ONO, Chairman  
Board of Land and Natural Resources

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE  
WILLIAM H.Q. BOW, PE

January 4, 1982

Mr. Susumu Ono, Chairman  
Board of Land and Natural Resources  
State of Hawaii  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: Draft Environmental Impact Statement  
for the Proposed Kahaluu Industrial Project  
Kahaluu, Koolaupoko, Oahu, Hawaii

Dear Mr. Ono:

We have received your letter of December 21, 1981 commenting on the above-mentioned project. We would like to provide the following responses to your concerns:

1. The proposed project will comply with the City's Shoreline Access Ordinance No. 4311 and the City's Park Dedication Ordinance No. 4621 as applicable. This was stated on page 60 of the Draft EIS. A similar statement was made on page 32.
2. As indicated in your comments, we are aware that the ultimate sanitary sewage disposal method should conform to the applicable governmental rules and regulations. The first alternative must be reviewed and approved by the City and County of Honolulu, Department of Public Works. The second alternative will be designed to comply with the regulations of the State of Hawaii Department of Health. Statements to that effect can be found on page 16 of the Draft EIS. The use of Alternative No. 1 is preferred and a preliminary engineering report will be prepared to determine if a sewer connection can be made to the Kahaluu Sewage Pump Station. This station is depicted as SPS No. 3 on the Sewer Master Plan and is scheduled to be completed by mid-1984.
3. Please see the enclosed letter from our environmental consultant, for a response to your comments. The data and information presented in the Draft EIS as well as the consultant's response do not predict significant environmental impact on the aquatic environment.
4. We appreciate the information provided on erosion control measures to be taken during construction. The Grading Ordinance of the City and County of Honolulu requires consideration of all of your three referenced mitigating measures.

Mr. Susumu Ono

- 2 -

January 4, 1982

5. We agree that if any unanticipated sites or remains are encountered, the contractor will contact your Historic Sites Section. This will be stated in appropriate places in the section, "The Relationship of the Proposed Action to Land Use Plans, Policies, and Controls for the Affected Area."

We appreciate your review and comments on this Draft EIS.

Very truly yours,

GRAY, HONG & ASSOCIATES, INC.

Dr. B.G.  
for Brian L. Gray

DB:vs:sc  
Enclosure: Consultant's letter  
copy: Cowell & Co., Inc.



APPENDIX A

KAHALUU INDUSTRIAL PROJECT  
EIS PREPARATION NOTICE

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

Approving Agency : City & County of Honolulu  
Department of Land Utilization (DLU)  
Applicant : Alexander & Baldwin, Inc.  
Agent : Cowell & Co., Inc.  
Project Location : Near the intersection of Waihee Road and  
Kamehameha Highway, Kahaluu, Koolaupoko  
District, Oahu, Hawaii  
Tax Map Keys : 4-7-13:01, 10, 11, 12, 16, 24  
Request : Special Management Area Use Permit (SMP)

I. Proposed Action

The proposed project site contains an area of about 26.3 acres. Within the project site, there are three different zoning designations, i.e., Light Industrial (13+ acres), R-6 Residential District (4+ acres), and R-3 Residential District (8+ acres).

The applicant proposes to construct a light industrial subdivision consisting of 21 lots on the industrial-zoning portions of the site. No structures are proposed to be built.

On the residential-zoned portions of the site, the applicant proposes to create an agricultural or residential development.

The proposed action will include the on-site construction of roadways; drainage and water systems; and either a sewage treatment and effluent disposal system, or discharged to City sewer.

A. Technical Characteristics

1. Approximately 1,050 feet of 56-foot wide paved roadway with access to Kamehameha Highway will be constructed.
2. On the industrial-zoned portions of the property, the creation of 21 lots ranging in size from .39 acres to 0.80 acres is proposed. Anticipated business uses of the 21 lots include commercial shops, warehouses and office space.
3. Seventeen (17) of the lots will be located on the mauka side of Kamehameha Highway. The remainder of the industrial lots (4) will be located on the makai side of Kamehameha Highway.

4. Three to four additional lots of 12 acres will be created for agricultural purposes if on-site effluent disposal is used. In the event sewage is discharged to a city sewer, a residential subdivision in accordance with the current zoning will be created.

B. Socio-economic Characteristics

1. According to the applicant, there is a need for the mixed use of the site as proposed. At present, there is no available sizable vacant land for industrial use on the Windward side. In addition, the proposed project would offer the local populace added employment alternatives in agriculture within their own community.
2. The cost of the proposed project is estimated at \$2.4 million.
3. The estimated time required for construction of the proposed project is about 12 months.

C. Environmental Characteristics

1. The proposed development is located on low-lying land of mostly flat terrain except for the southwestern portion of the parcel.
2. The proposed drainage system for this development consists of an on-site underground pipe system with outlets at the unnamed stream that borders the north-west boundary of the property. The on-site drainage system will be located within the roadway.
3. The general area, in which the project site is located, is not connected to the municipal sewage treatment system and is served by cesspools. The construction of a sewage treatment and effluent disposal system is proposed. The exact method of sewage disposal for the proposed project must be examined and given preliminary approval by the City and County of Honolulu DPW and the State Department of Health (DOH) prior to the approval of a Special Management Area Use Permit (SMP). As an alternative, a sewer line could be extended to connect to the City system.

4. Tax map key parcels 4-7-13:10, 12, 16 and 24 are located within adjacent wetlands as designated by the U.S. Army Corps of Engineers. The project is located above the headwaters of the unnamed stream that delineates the northwestern boundary of the site.
5. Water availability and water development charges will be determined by the Board of Water Supply at the time the construction plans are approved.

### III. Affected Environment

The project site is divided by Kamehameha Highway. The parcel is bounded on the makai side by Kaneohe Bay. Directly southeast of the project site is a Hawaiian Telephone transfer station, a Board of Water Supply pumping station and a Hawaiian Electric booster station; mauka of the site are rural residential structures; an unnamed stream shown incorrectly on TMK maps as Kaalaea stream delineates the northwestern boundary. The project site is currently vacant and is used for grazing.

The project site is zoned I-1 Industrial District, and R-3 and R-6 Residential Districts. The existing Detailed Land Use Map (DLUM) designates the project site for light industrial and residential uses. A portion of the site is located within the Special Management Area (SMA).

#### A. Major Impacts to the SMA

The potential environmental impacts as related to the significance criteria set forth in Ordinance Nos. 4529 and 77-100, are briefly identified in the following discussion. These and other impacts will be thoroughly addressed in the final EIS document.

1. The proposed project will create physical impacts to the site and its surroundings during construction and after the project has been completed. The project is located in Waihee drainage basin which discharges into Kaneohe Bay. Kaneohe Bay is classified by the DOH as having Class AA waters; therefore, drainage is a concern.
2. Land alteration will change the site from undeveloped vacant land to a mix of light industrial and either agricultural or residential uses.

The 21-lot industrial subdivision will contain paved roadways, drainage and water systems and a sewage treatment and effluent disposal system.

3. Sewage disposal is of primary concern in this area due to impermeable soil conditions and high water table. Prior approval of a SMP approval of the sewage disposal system will be obtained by the City and County of Honolulu DPW and the State of Hawaii DOH. The City and County of Honolulu has completed preliminary studies regarding a sewer system in this general area.
4. Grading of the project site will be required to level off and fill the site prior to construction.
5. The visual impact of the proposed project will be examined.
6. An archaeological/historical reconnaissance of the project site will be conducted to verify the existence or absence of such artifacts, due to its proximity to Kahaluu Fishpond.

**B. Mitigation Measures**

The applicant will adhere to all applicable City and County of Honolulu and State of Hawaii regulations which would govern the construction and operation of the proposed project. The EIS will address all potential impacts of the proposed projects and mitigating measures.

**IV. Policies and Guidelines To Be Discussed in the EIS**

As stated previously, the project site is located within the Special Management Area (SMA). Since the proposed action involves construction within the SMA, a Special Management Area Use Permit is required prior to construction. In compliance with the City and County of Honolulu, Department of Land Utilization, an accepted EIS which addresses the significance of the proposed project within the SMA will be submitted concurrently with the SMA permit application.

V. Suggested Agencies To Be Consulted in Preparation of EIS

City & County of Honolulu

Honolulu Fire Department  
Department of General Planning  
Department of Parks & Recreation  
Board of Water Supply  
Police Department  
Department of Public Works  
Department of Transportation Services

State of Hawaii

Department of Transportation  
Department of Planning & Economic Development  
Department of Land & Natural Resources  
Department of Health  
Office of Environmental Quality Control  
Department of Agriculture

University of Hawaii

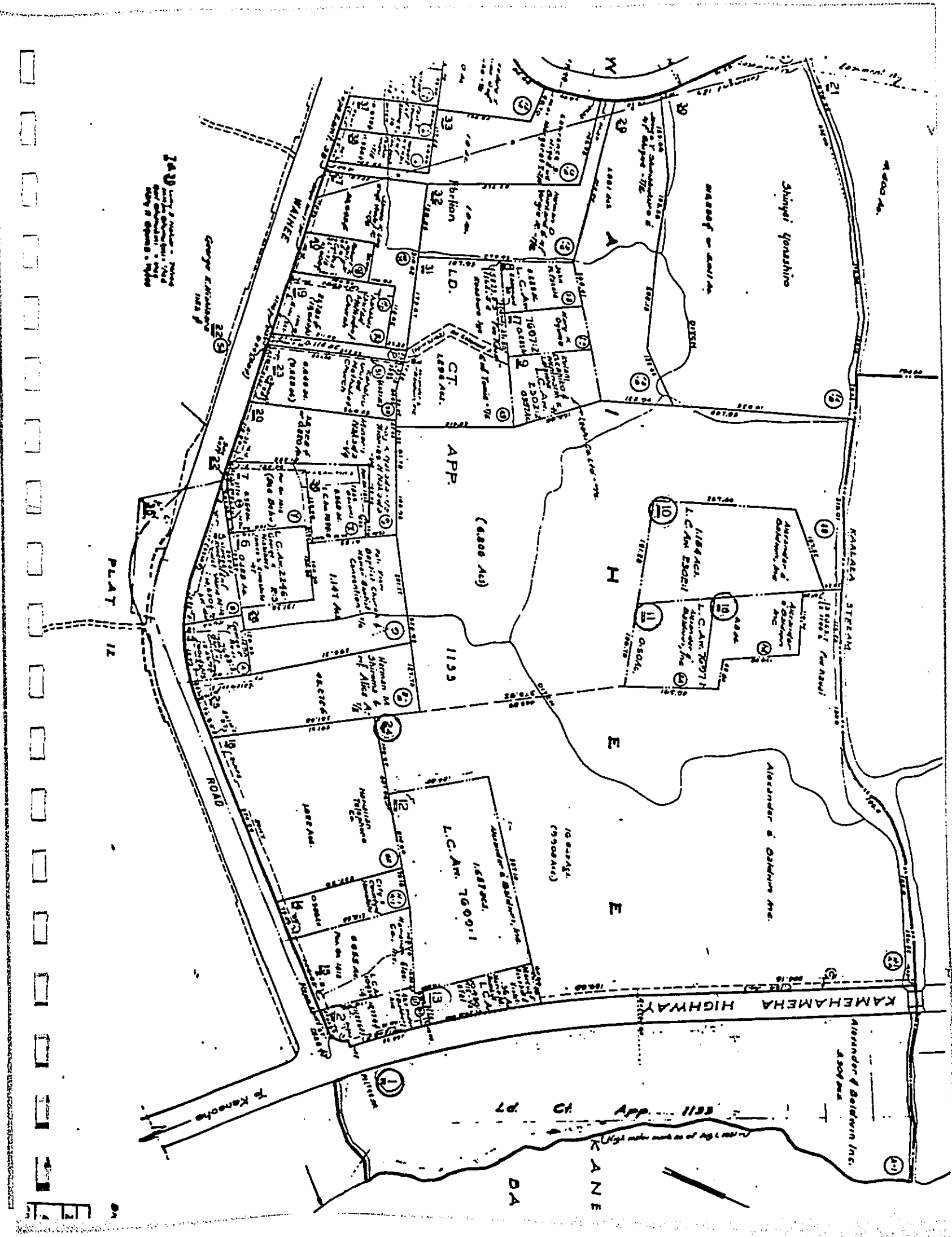
Environmental Center  
Water Resources Research Center

Federal

U.S. Army Corps of Engineers  
U.S. Fish & Wildlife Service  
U.S. Department of Agriculture, Soil Conservation Service

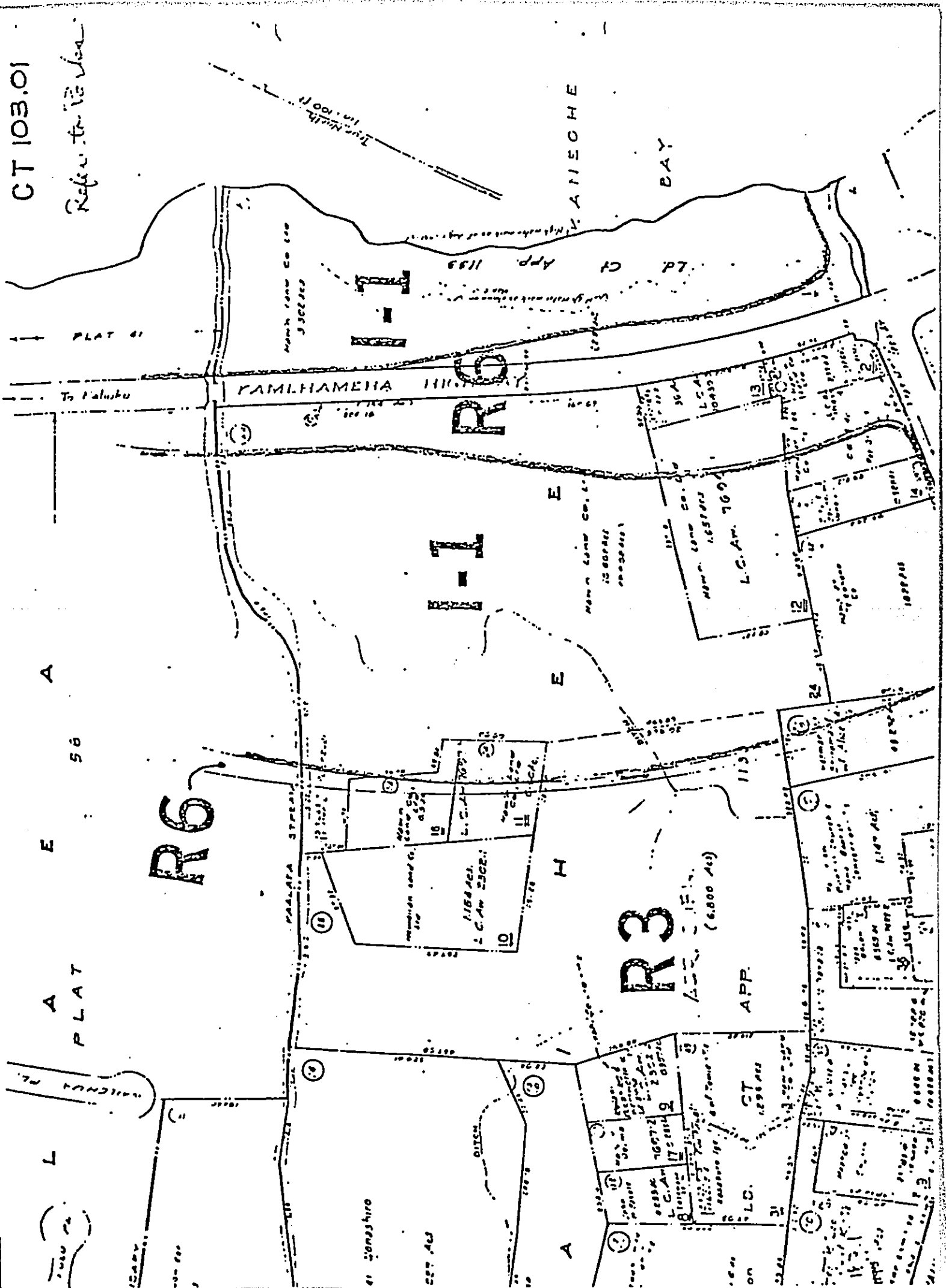
Community Organizations

Life of the Land  
Kaneohe Outdoor Circle  
American Lung Association of Hawaii  
Kahaluu Neighborhood Board No. 29  
Kahaluu Neighborhood Board No. 30  
Kaneohe Community Council  
Kaneohe Business Group  
Kaneohe Bay Community Association  
Hui Malama Aina O'Koolau  
Key Project  
Sierra Club



CT 103.01

Refer to Volume







APPENDIX B

KAHALUU INDUSTRIAL PROJECT  
PRELIMINARY DRAINAGE STUDY

PRELIMINARY DRAINAGE STUDY  
KAHALUU INDUSTRIAL PROJECT  
Tax Map Key 47-13:01, 10, 11, 12, 16 & 24

Prepared by Gray, Hong & Associates, Inc.

I. INTRODUCTION

The proposed project site consists of 26.0± acres of land located adjacent to the intersection of Waihee Road and Kamehameha Highway in Kahaluu, Oahu, Hawaii (see Area Location Map - Exhibit I). It is proposed to develop 24 lots on this split zoned piece of land. Immediate plans call for the creation of 21 industrial subdivision lots (Lots 1-17 and 18-21) as indicated on Exhibit II. Lots 22, 23 and 24 are presently zoned residential and there are no present plans to develop those lots. Lot 24 is further intended for agricultural use.

The purpose of this preliminary drainage study is to define the existing drainage basin characteristics and to establish the design parameters for improvements along North Waihee Stream which may be required.

II. EXISTING CONDITIONS

North Waihee Stream bounds the Kahuku side of the project as illustrated in Exhibit II. North Waihee Stream is the smallest of six streams which enter Kaneohe Bay between Kahaluu Pond and Pulama Road. All of these streams have relatively well-defined stream basins above the 30± feet elevation; however, the drainage areas below the 30± feet elevation become broad and generally congregate directly mauka of Kamehameha Highway. Kamehameha Highway is further generally elevated 1-2 feet in relation to adjacent lands on either side of Kamehameha Highway.

The elevation of Kamehameha Highway in respect to the lands directly mauka of Kamehameha Highway creates a long overflow weir when the existing drainage systems under Kamehameha Highway are inadequate to accommodate storm water flow. This condition occurs at the point adjacent to the proposed project where North Waihee Stream discharges under Kamehameha Highway.

The drainage basin of North Waihee Stream is 350± acres (see Exhibit III). Based on the City and County of Honolulu's Drainage Standards (Plate 6), the peak discharge for the North Waihee Stream drainage basin is 3200 cfs.

The existing box culvert system under Kamehameha Highway at North Waihee Stream consists of two (2) 5'x12' box culverts. The invert of the box culvert

system is 1.0+ feet (MSL), the top of the box culvert is at elevation 6.0+ feet (MSL) and the roadway surface is at elevation 8.0 feet. Kaneohe Bay is approximately 300 feet makai of Kamehameha Highway. By utilizing a nominal slope of 0.0033 ft/ft, the capacity of the box culvert can be calculated by Manning's equation.

$$V = \frac{1.49}{n} R^{2/3} S^{1/2}$$

where V = velocity in ft/sec

n = roughness coefficient = .015

$$R = \text{hydraulic radius} = \frac{(5 \times 12)(2)}{[2(5) + 12]^2} = 2.72$$

S = slope in ft/ft = .0033

$$V = \frac{1.49}{.015} (2.72)^{2/3} (.0033)^{1/2}$$

$$V = 11.1 \text{ ft/sec}$$

$$\text{and } Q = VA$$

Q = flow in cubic feet per second, cfs

where V = velocity in ft/sec

A = cross section area of box culvert =  
 $(5 \times 12)(2) = 120 \text{ ft}^2$

$$\therefore Q = 11.1 \text{ ft}^3/\text{sec} \times 120 \text{ ft}^2 \\ = 1340 \text{ ft}^3/\text{sec}$$

Since the capacity of the box culvert system is inadequate to carry the peak discharge of 3200 cfs, storm water will back up behind Kamehameha Highway to an elevation of 8.0 feet (MSL) which represents the crown of Kamehameha Highway. At this water surface elevation the box culvert is subject to entrance control. Plate 20 of the Storm Drainage Standards predicts the discharge from the box culvert will reduce to 1200 cfs based on the additional losses associated with entrance control.

Therefore, the capacity of the existing box culvert is 1200 cfs while the peak discharge is 3200 cfs. The difference (2000 cfs) represents the discharge which passes over Kamehameha Highway during a 50-year design storm.

The resulting depth of flow over Kamehameha Highway can be calculated by analyzing the highway as a broad-crested weir. Kamehameha Highway can act as a weir between Wailehua Road and North Waihee Stream. For uniformity, it has been assumed that an equivalent length of weir exists on the Kaneohe side of the box culvert even though aerial topo (see Exhibit IV) indicates a longer length could be utilized. A total weir length of 700 feet has been utilized. The weir effect has been assumed to occur for a length of 350 feet on each side of Kamehameha Highway adjacent to the box culvert. Bazin's Formula:

$$Q = \left( 0.405 + \frac{0.00984}{H} \right) \left[ 1 + 0.55 \frac{H^2}{(P + H)^2} \right] LH \sqrt{2gH}$$

where Q = flow, cfs  
 H = height of flow over weir, ft.  
 P = height of weir, ft.  
 L = length of weir, ft.  
 g = 32.2 ft/sec<sup>2</sup>

defines the flow over broad-crested. Therefore, by assuming H = 0.9 feet:

$$Q = (0.405 + \frac{0.00984}{0.9}) [1 + 0.55 \frac{(0.9)^2}{(7+0.9)}] (700)(0.9) \sqrt{(2)(32.2)(0.9)}$$

$$= (.416)(1.06)(700)(0.9)(7.6)$$

$$= 2110 \text{ cfs} > 2000 \text{ cfs} \quad \therefore \text{OK}$$

The preceding equation defines the height of flow over Kamehameha Highway at slightly less than 0.9 feet. The velocity of flow over the weir is based on continuity is 3.0 ft/sec.

The stormwater surface mauka of Kamehameha Highway will for all practical purposes remain at 8.9 feet (MSL) as long as the velocity within the drainage basin remains small. To verify that the stormwater velocity is negligible, a section mauka and parallel to Kamehameha Highway is illustrated in Exhibit V. Based on continuity, the appropriate velocity is obtained by:

$$Q = VA$$

where Q = flow, cfs

V = velocity, ft/sec

A = area, ft<sup>2</sup>

$$3200 \text{ cfs} = (V) 2500 \text{ ft}^2$$

$$V = 1.3 \text{ ft/sec}$$

This condition exists over the entire industrial subdivision portion of the project. Between the industrial subdivision portion of the project and the mauka extreme of the R-3 residential portion of the project, the flow may become super critical.

The preceding analysis predicts the water surface over the site for a peak discharge of 3200 cfs. There are no actual recorded values of the 100-year peak discharge (Q<sub>100</sub>) for North Waihee Stream. However, by comparing 100-year recorded peak discharges vs. drainage basins for neighboring streams, a reasonable estimate of the peak discharge for North Waihee Stream can be projected. Such an evaluation has been conducted for Waihee Stream near Heeia (Sta. No. 2840) where the peak discharge (Q<sub>100</sub>) is 4,580 cfs within a 0.93 square mile drainage basin. The resulting extrapolation predicts a peak discharge (Q<sub>100</sub>) for North Waihee Stream of 2,660 cfs.

The resulting design peak discharge of 3200 cfs and extrapolated peak discharge (Q<sub>100</sub>) are sufficiently similar to assign a 100-year flood

inundation elevation of 8.9 feet (MSL) to the project area. This elevation represents the maximum elevation of water passing over Kamehameha Highway and over the site.

### III. PROPOSAL

There are two (2) alternative methods to raise the project out of the flood plain. These are:

- 1) Fill the site to an elevation above the flood plain without improving the box culvert at the North Waihee Stream box culvert.
- 2) Improve the North Waihee Stream box culvert and utilize a reduced amount of fill to elevate the site out of the flood plain.

Both alternatives are analyzed below. Inherent to both alternatives is the requirement to add fill to the project site to raise the finished grade and create an open channel along the portion of North Waihee Stream bordering the project. It has been assumed that development could occur on both sides of North Waihee Stream. Therefore, the typical design section of the proposed open channel is 100-foot wide (see Exhibit VI).

#### ALTERNATIVE NO. 1

The assumptions forming the basis for Alternative No. 2 are:

- 1) No improvements to North Waihee Stream box culvert system at Kamehameha Highway.
- 2) Fill site as necessary to provide finished grade elevation which accommodates freeboard elevation at design flow.

The capacity of the North Waihee box culvert system, as discussed earlier, will remain 1200 cfs and the discharge across Kamehameha Highway will remain 2000 cfs. However, the effective weir length will be reduced to 100-foot (width of open channel). The resulting depth of flow can be computed by Bazin's Formula:

$$Q = \left( 0.405 + \frac{0.00984}{H} \right) \left[ 1 + 0.55 \frac{H^2}{(P + H)^2} \right] LH \sqrt{2gH}$$

assuming  $H = 3.5'$

$P = 7.0'$

$$Q = 22.7 \text{ cfs/ft} \times 100 \text{ ft} = 2270 \text{ cfs} > 2000 \text{ cfs}$$

∴ OK

The resulting upstream design channel sections can be computed under this condition by utilizing Kamehameha Highway as a control section and

performing a backwater curve analysis to establish the water surface elevation at various stations mauka of Kamehameha Highway. It is not intended to actually compute the sections as a portion of this preliminary analysis. However, allowing for a water surface elevation of 11.4 feet (MSL) and a minimum freeboard requirement of 2.0 feet, the projected finished grade for the industrial subdivision can likely range from 13.5+ feet adjacent to Kamehameha Highway through 14.5+ feet at the mauka extreme of the project site.

ALTERNATIVE NO. 2

The assumptions forming the basis for Alternative No. 2 are:

- 1) Improve North Waihee Stream box culvert to accommodate design storm.
- 2) Fill site as necessary to provide finished grade elevation which accommodates freeboard elevation at design flow.

The proposed new box culvert at Kamehameha Highway must be sized to accommodate a peak discharge of 3200 cfs and provide sufficient freeboard. Preliminary calculations indicate that a box culvert with overall dimensions of 7.5 feet by 50 feet will accommodate the peak design flow as well as the freeboard requirements. The velocity through the resulting box culvert will be approximately 13.5 ft/sec. The channel down stream of the box culvert to Kaneohe Bay must be a lined channel consisting of either concrete or grouted rip-rap. The proposed box culvert and lined channel improvements will require a Department of the Army Permit.

By utilizing the same design channel section as depicted in Exhibit VI, the water surface and required freeboard elevations mauka of Kamehameha Highway can again be calculated by balancing energy between a control section (in this case the improved box culvert) and various upstream channel sections. Preliminary calculations indicate that the freeboard elevation is 7.8+ feet (MSL) directly adjacent to Kamehameha Highway, 8.9+ feet (MSL) at the mauka end of the industrial subdivision and 13.4+ feet (MSL) at the mauka extent of the project. The velocity through the design channel is approximately 7.0 ft/sec. The maximum permissible velocity for use of a grassed unlined channel is 5.0 ft/sec.

#### IV. PROJECT SITE CONDITIONS

The existing 26.0 acre project site consists of marsh and lands overgrown in California grass. Based on Rational Method calculations, the existing runoff occurring from the project site is:

$$Q_{10} = CIA$$

where Q = flow rate, cfs  
C = runoff coefficient  
I = rainfall intensity, in/hr for a rainfall intensity equal to the time of concentration  
A = drainage area, acres

$$Q_{10} = (0.70)(3.6 \times 1.5)(26.3) = 99.4 \text{ cfs}$$

Under the proposed industrial subdivision development, the runoff will increase and can again be predicted by the use of the Rational Method with different coefficients for the runoff and the rainfall intensity adjustment. The runoff from the project site is:

$$Q_{10} = CIA$$
$$= (0.80)(3.6 \times 2.2)(26.3) = 167 \text{ cfs}$$

The preceding runoff calculations are based on a 10-year recurrence interval which is the design recurrence interval for a drainage area of less than 100 acres. The 26.0± acre site represents 8.0 percent of the North Waihee Stream drainage basin.

#### V. SUMMARY

The foregoing analysis establishes a design peak discharge for North Waihee Stream of 3200 cfs.

A recorded peak discharge ( $Q_{100}$ ) is not available for North Waihee Stream. However, extrapolation from neighboring streams predicts a peak discharge ( $Q_{100}$ ) of 2660 cfs.

The 100-year flood inundation elevation for the site under existing conditions is 8.9± feet. This is the maximum elevation of stormwater which must pass over Kamehameha Highway due to the inadequacy of the existing box culvert under Kamehameha Highway at Waihee Stream.

There are two drainage alternatives for the proposed project. These are:

- 1) Do not improve the box culvert at Waihee Stream and fill the entire project site to the freeboard elevation for the resulting peak discharge. The approximate finished grade of the fill is 13.5± feet adjacent to Kamehameha Highway and 14.5± feet at the mauka extreme of the project.



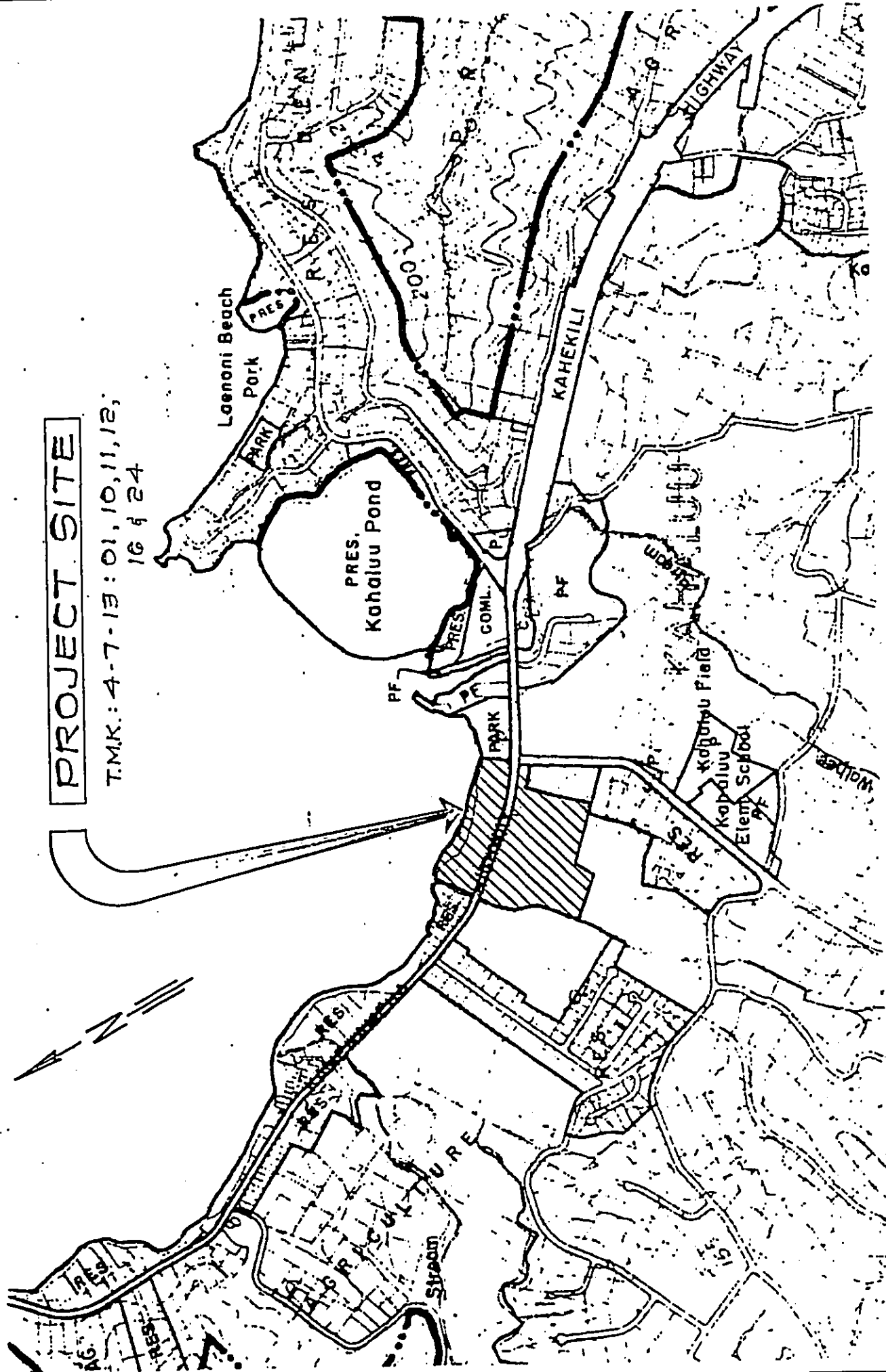
- 2) Improve the box culvert at North Waihee Stream and provide a lined channel from Kamehameha Highway to Kaneohe Bay. In addition, place fill on the project site to elevate the project to the required freeboard elevation. The preliminary calculations indicate with an improved box culvert at Kamehameha Highway, the necessary finished grade at Kamehameha Highway will reduce to approximately 7.8+ feet (MSL) adjacent to Kamehameha Highway, 8.9+ feet (MSL) at the mauka extreme of the industrial subdivision and 13.4+ feet at the mauka extreme of the project site.

The proposed box culvert improvements and lined channel improvements from Kamehameha Highway to Kaneohe Bay will require a Department of the Army Permit.

The runoff resulting from the project site based on a 10-year recurrence interval ( $Q_{10}$ ) is 99.4 cfs under existing conditions. The runoff will increase to 167 cfs based on development of an industrial subdivision.

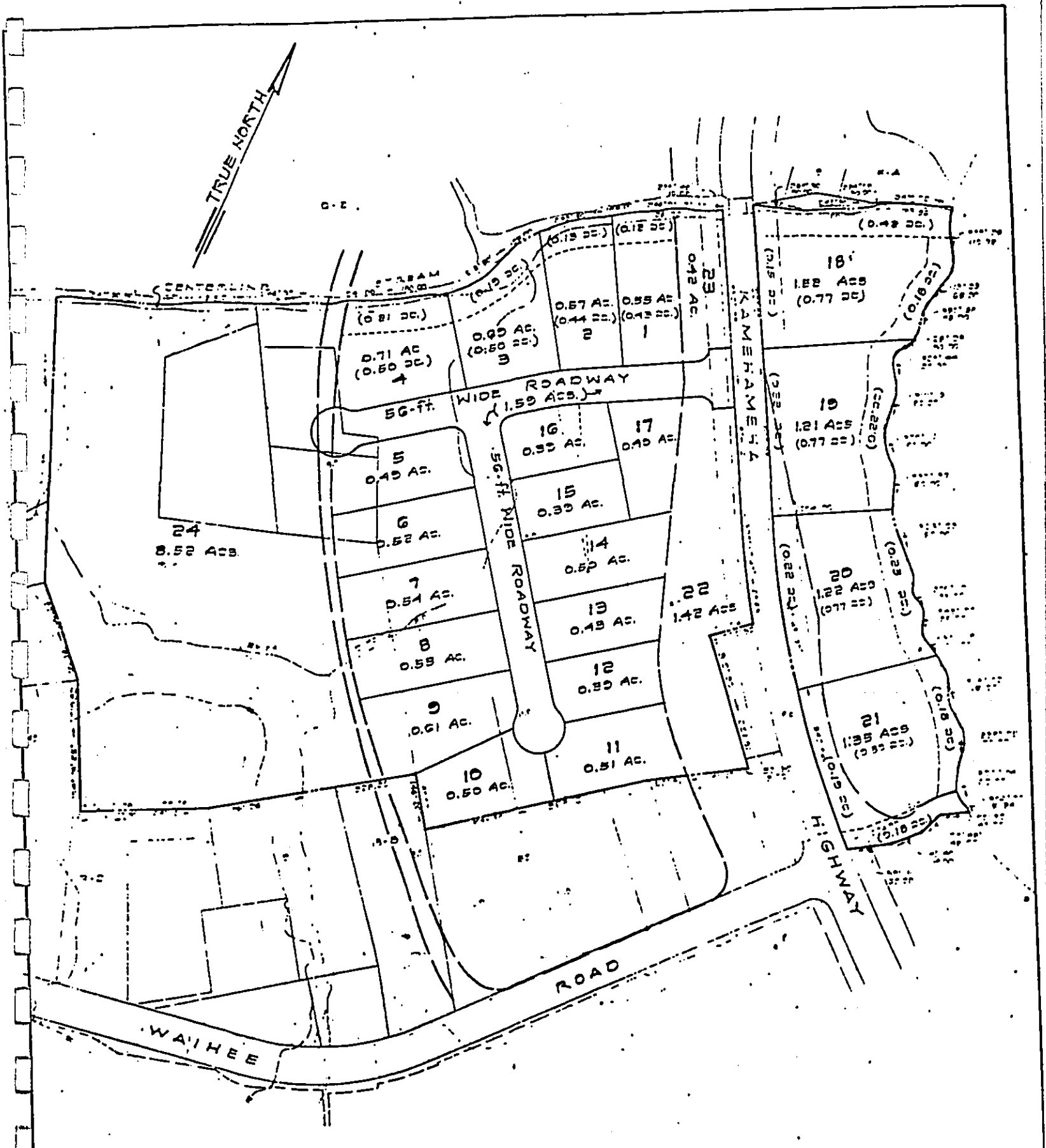
**PROJECT SITE**

T.M.K.: 4-7-13: 01, 10, 11, 12;  
16 & 24

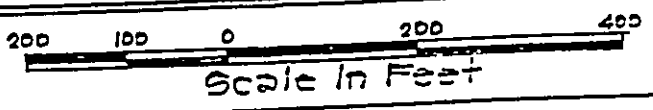


**EXHIBIT I**  
**AREA LOCATION MAP**

Scale: 1" = 1000'



**EXHIBIT II**  
**PROPOSED SUBDIVISION**



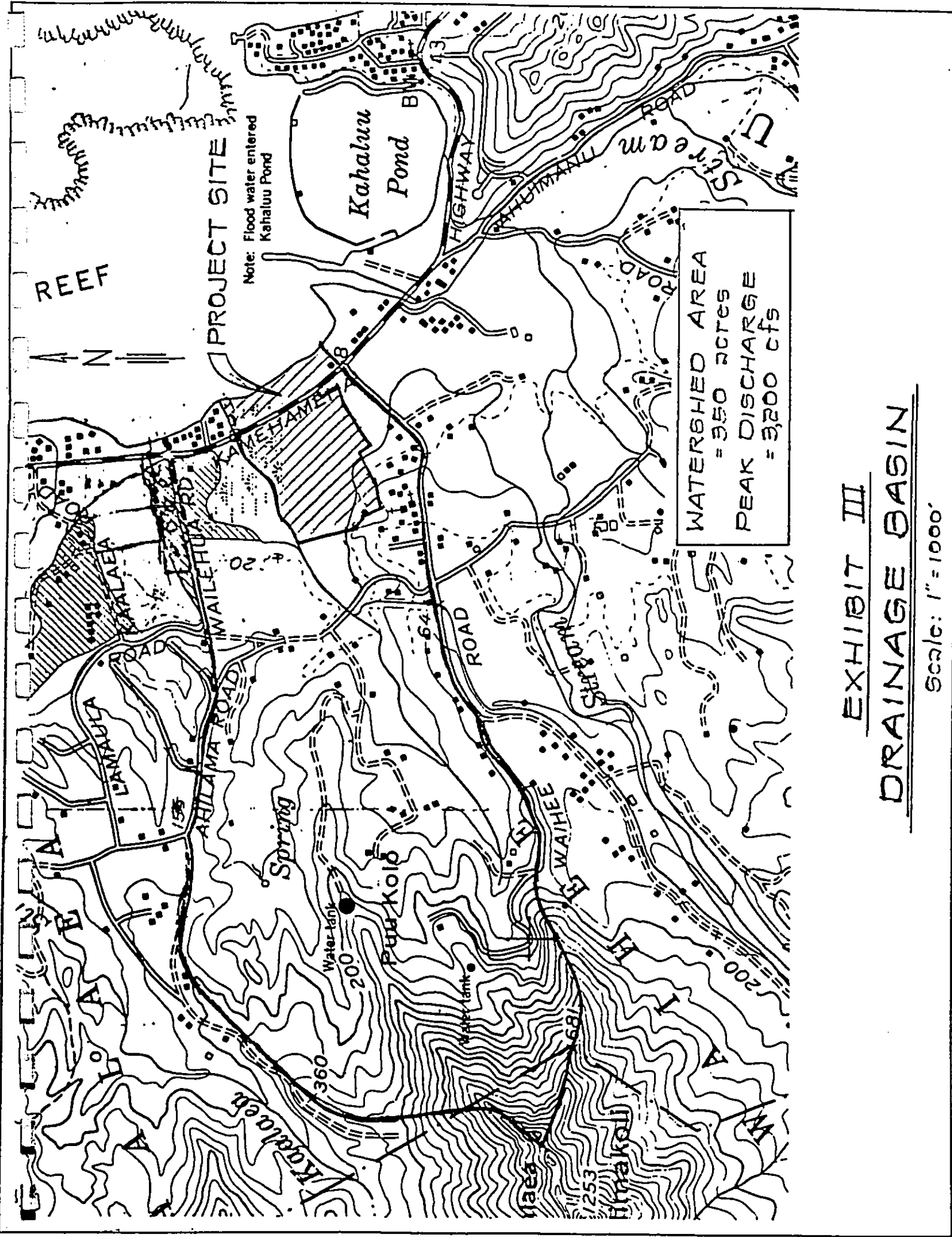


EXHIBIT III  
DRAINAGE BASIN

Scale: 1" = 1000'

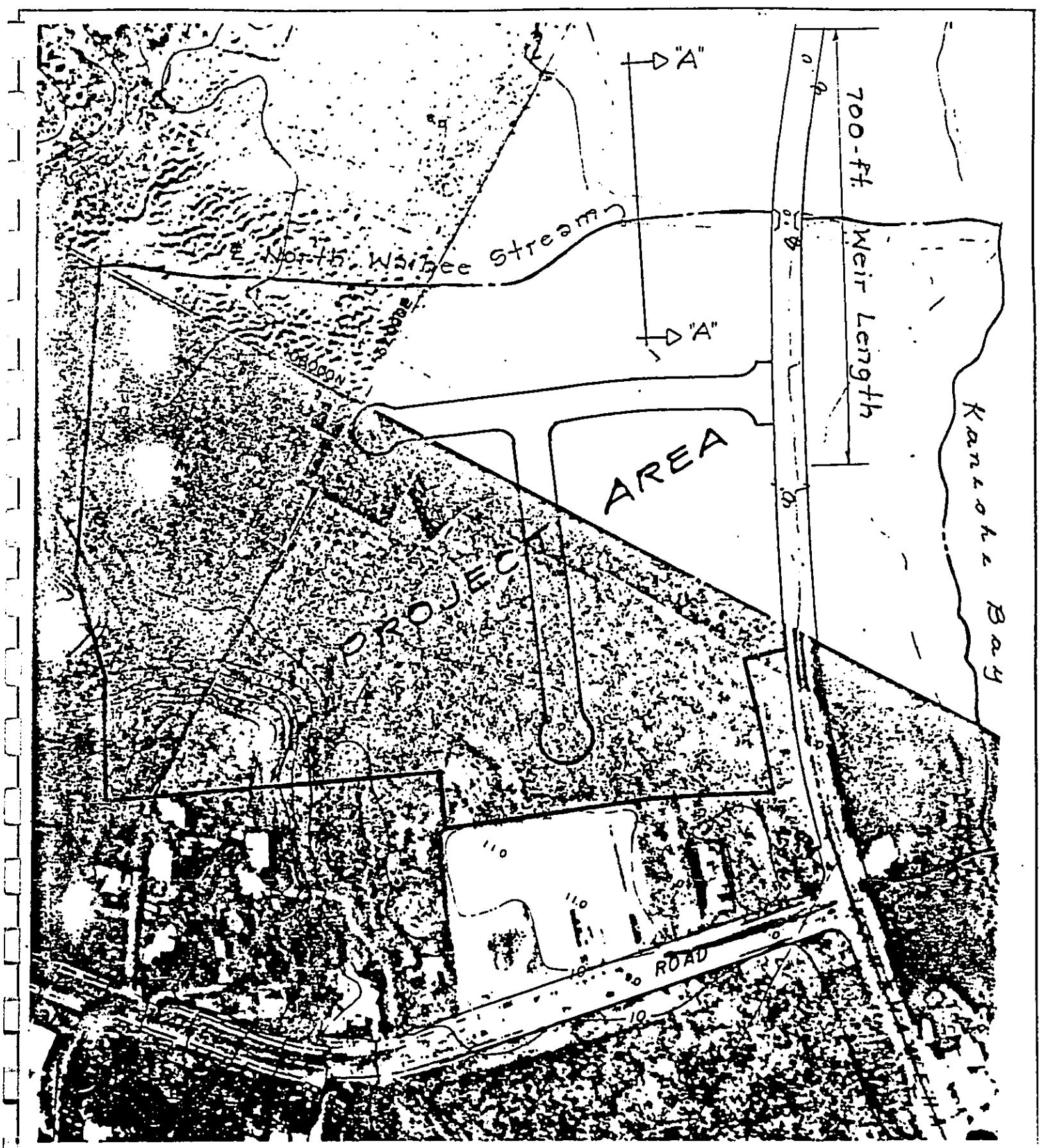


EXHIBIT IV  
AERIAL TOPO  
Scale: 1" = 200'

± North Waihee Stream

Existing Ground

W.S. = 8.5 Δ

AREA = 2,500 ±

EXHIBIT V

SECTION "A-A"

400-FT. UPSTREAM FROM  
KAMEHAMEHA HIGHWAY

Not to Scale

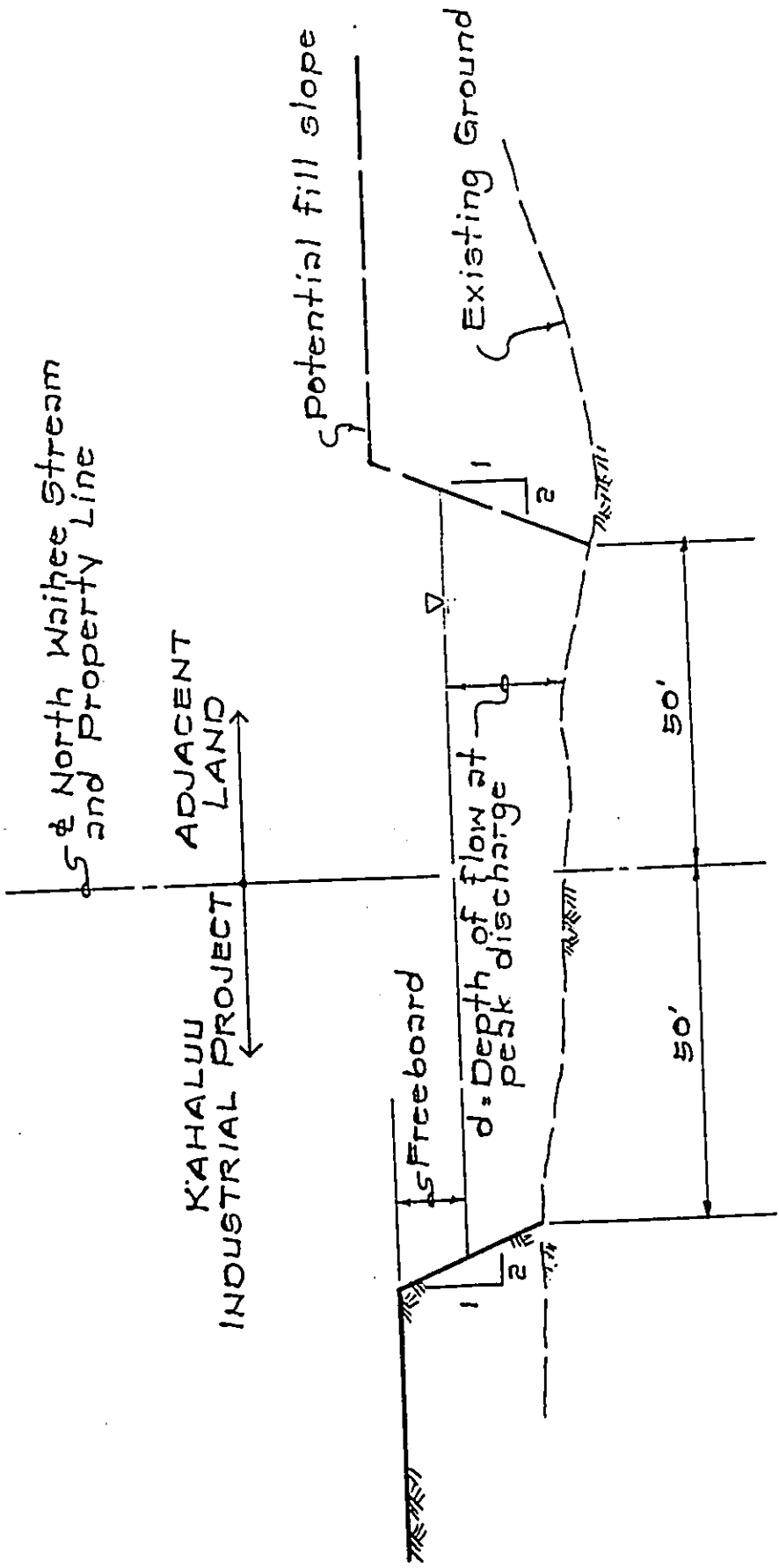


EXHIBIT VI  
TYPICAL DESIGN SECTION  
Not to Scale

APPENDIX C

AN ARCHAEOLOGICAL RECONNAISSANCE

at

Waihe'e Ko'olau Poko, O'ahu, Hawai'i





JOSEPH KENNEDY  
*Archaeologist*

ARCHAEOLOGICAL CONSULTANTS  
of  
HAWAII

3060 Huelani Dr.  
Honolulu, Hawaii 96822  
(808) 988-6307

An Archaeological Reconnaissance

at

Waihe'e, Ko'olau Poko, O'ahu, Hawai'i

## INTRODUCTION

On August 10 and 11, 1981, the Archaeological Consultants of Hawaii conducted an archaeological walk-through survey at Waihe'e, Ko'olau Poko district, O'ahu (TMK 4:7:13 - 1, 2, 3, 10, 11, 12, 16 and 24). This archaeological reconnaissance report was prepared for Gray, Hong and Associates and was designed to verify the presence or absence of archaeological/historic features within the limits of the subject parcel.

## PHYSICAL SETTING

The survey area is located on the windward side of the island of O'ahu and is bordered on the south by Waihe'e Road and on the north by an unnamed stream. On the State of Hawaii tax map, the unnamed stream is incorrectly called Ka'alaea; the U.S. Geological Survey map of the area clearly places Ka'alaea Stream farther north and demonstrates that there is actually little or no connection between the two.

Two distinct yet related environmental areas are exhibited within the boundaries of the subject parcel. On the makai or or seaside of Kamehameha Highway there is a mangrove swamp. On the mauka or mountainside of the road is the Waihe'e Marsh. As might be expected, the entire makai section (parcel no. 1) is completely dominated by a thick stand of mangrove (Rhizophora mangel L). The mauka marshland (parcel nos. 2, 3, 10, 11, 12, 16 and 24) features a mixed floral cover consisting primarily of California grass (Brachicaria mutica), arrowhead (Sagittaria

sagittaeifolia) and great bulrush (Scirpus validus).

#### METHODOLOGY

Movement through both the swamp and the marsh areas was very difficult. In the case of the former, brackish muck combined with numerous, tangled mangrove roots made passage in some places virtually impossible. However, with the help of two chain saws, a single survey path was eventually cut the entire length of parcel no. 1 (106.7 m).

Movement through the Waihe'e Marsh, while of a different character, was no less difficult. California grass and great bulrush were both more than 2 m high and dense. The underlying soil is waterlogged with up to 60+ cm of freshwater making it very difficult to walk through. Four passes were made across the marsh (roughly 100 m long) and each pass was spaced approximately 10 m mauka from the last. The sweep patterns were made to run parallel with Kamehameha Highway. Throughout each sweep, a long bamboo probe was sunk into the soil to try and determine if any stone work remained, either silted over or hidden by the water. Every probe indicated approximately 50 cm of freshwater on the surface, followed by 1.5 m of muck, and no evidence of any terrace walls, stone paving. etc.

#### PREVIOUS ARCHAEOLOGICAL WORK IN THE AREA

The nearest location of any previous archaeological reconnaissance took place near the Kahalu'u Reservoir. In 1974,

Steven Clark of the Bernice P. Bishop Museum filed a one-page report stating that he found no archaeological sites in his 50-acre survey for the Soil Conservation Service (BPBM manuscript no. 082374). Roughly 5 miles away Paul Rosendahl and others did some work and published the results in June of 1976 under the title, Archaeological Investigations in Upland Kaneohe: terracing and a large earth mound were reported in this area.

The current report apparently represents the first archaeological work to be done on this specific piece of land in the ahupua'a of Waihe'e. However, Handy in 1940 mentions:

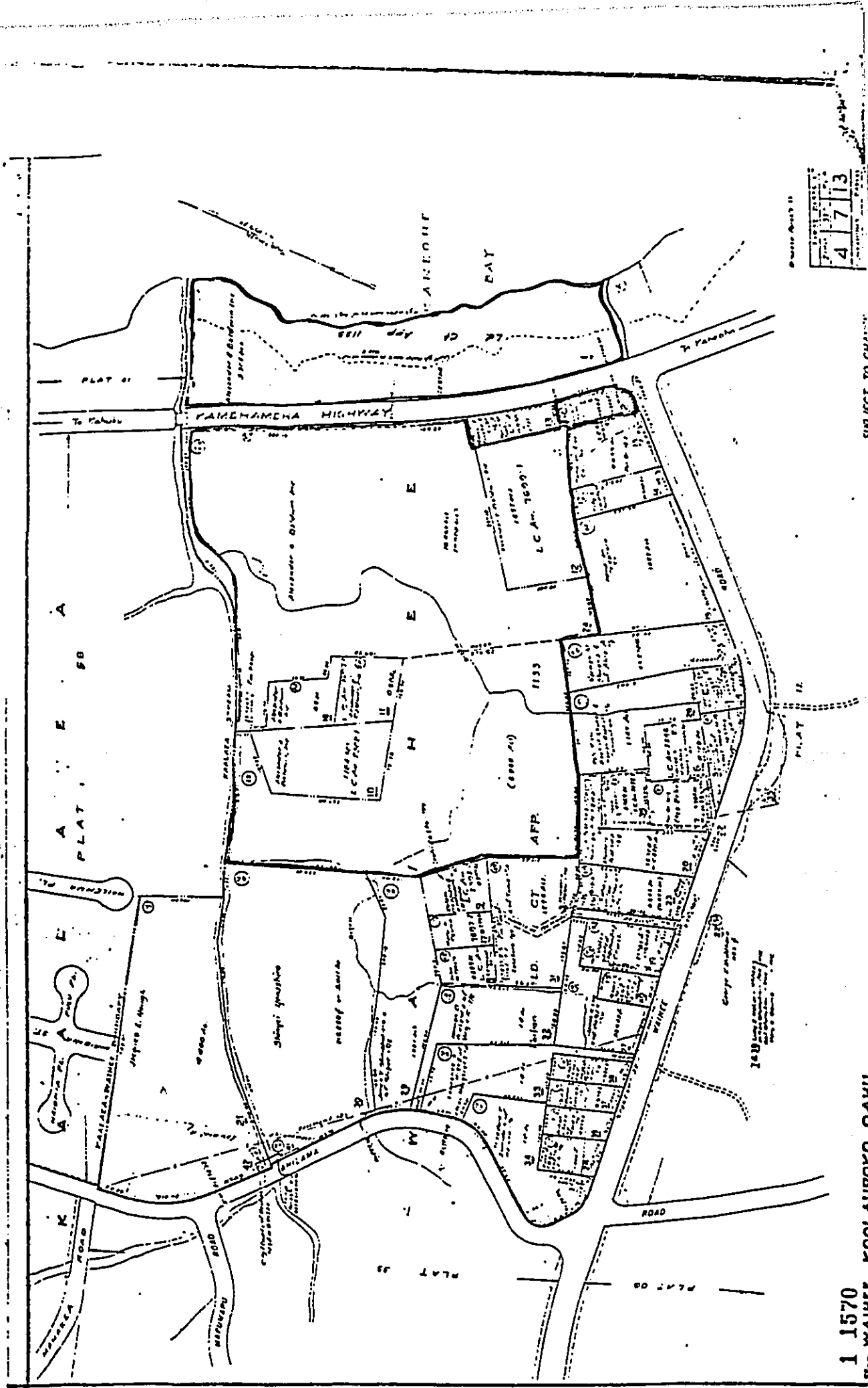
The broad flats of Waihee from the seashore inland are continuous with those of Kaalaea to the north and Kahaluu to the south. These contiguous flats, all sectioned with terraces, make one of the largest single areas of wet taro land on the Koolau coast...The old terraces, now abandoned ran back into these valleys for about 1.5 miles.

There can be no doubt that the subject parcels of this report were part of the system that Handy describes.

#### CONCLUSIONS AND RECOMMENDATIONS

While it is certain that this area was once the site of intense taro production, it is equally certain that none of the terrace walls or other irrigation features have survived.

The land use records indicate that most all taro-producing sites on the windward side of O'ahu were converted to rice production sometime between 1870 and 1900. A map of the subject parcel (and adjoining areas) prepared by Wright, Harvey and Wright, Inc. 1936, still showed the outline of taro lo'i concen-



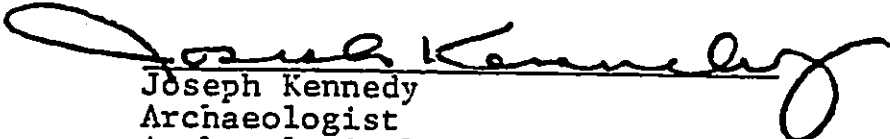
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trated primarily in the northeast corner of parcel no. 24. On-site survey and test probing demonstrates that these features no longer exist. It seems likely that these taro lo'i were used for rice and later the walls destroyed altogether in order to use this land for pasture. Sugar cane (Saccharum officinarum) was also produced in this area (although certainly not within the boundaries of the marsh land). The Ka'alaea Mill was located a full 550 m mauka of Kamehameha Highway and is not within the boundaries of the subject parcel.

There were no archaeological features present in parcel no. 1 (the mangrove swamp makai of Kamehameha Highway). Because there is a direct correlation between the presence of mangrove and soil deposition, it is quite possible that a major portion of parcel no. 1 was actually underwater or within the high tide zone during the time of aboriginal Hawaiian occupation.

After careful examination of the site, it has been determined that there are no above ground archaeological features located within the boundaries of the subject parcel nor any indication that significant features lie buried underneath. This does not preclude the possibility that some matters of archaeological interest (e.g. burials, stone pavings, etc.) may appear at this site during some phase of the construction process; if so, the developer is urged to consult an archaeologist. Until such time, it is recommended that no further archaeological action is required.

  
Joseph Kennedy  
Archaeologist  
Archaeological Consultants of Hawaii  
August 20, 1981

APPENDIX D

ENVIRONMENTAL ASPECTS  
OF  
STORM WATER RUNOFF

Environmental Aspects  
of  
Storm Water Runoff  
Kahaluu Industrial and Residential Development  
Kahaluu, Oahu, Hawaii

September, 1981

by  
Gordon L. Dugan, Ph.D.  
Environmental Consultant



September 29, 1981

MEMORANDUM

TO: David Bills  
Gray, Hong & Associates, Inc.  
116 South King St., Room 508  
Honolulu, Hawaii 96813

FROM: Gordon L. Dugan *Gordon L. Dugan*  
Environmental Consultant  
704 Ainapo St.  
Honolulu, Hawaii 96825

SUBJ: Report entitled "Environmental Aspects of Storm Water Runoff,  
Kahaluu Industrial and Residential Eevelopment, Kahaluu, Oahu,  
Hawaii."

The above referenced report considered the volumetric, nitrogen, phosphorus, and suspended solids changes that are expected to occur from the development of the 26 acre industrial and residential area contained within the project. In addition biocides and heavy metals were also discussed.

In general, due to the increased percentage of impervious surfaces and the higher nitrogen and phosphorus concentrations, for industrial areas, nitrogen and phosphorus constituent loads increased somewhat for the standard storms; however, the suspended solids loads for the standard storms were estimated to decrease. In terms of heavy metals, lead is the only constituent that apparently exceeds the limits that were established or recommended for drinking water. Lead should be steadily decreasing as more and more vehicles begin and continue to use unleaded gasoline. Biocides in present use are broken down in a relatively short period of time.

Please advise me of any questions you have concerning this report.

ENCLOSURE:

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## INTRODUCTION




























The proposed Kahaluu Industrial and Residential Development, located at Kahaluu in Windward Oahu, Hawaii, as shown in Figure 1, is intersected by Kamehameha Highway, with Waihee Road to the south, and North Waihee Stream fronting the north edge of the property. Also, the project site's south boundary commences approximately 800-ft north of the recently constructed 28-acre multi-purpose lagoon. General and specific project site plans are presented in Figures 2 and 3, respectively. The boundaries of the project are within the 350 acre North Waihee Stream Drainage basin. The climate at the site is typical of that for Windward Oahu, with a mean annual rainfall of approximately 60-in. (figure 1), and a temperature that averages 75°F throughout the year.

The 26 acre project, as outlined in Figure 3, consists of 21 industrial lots, covering 14 acres, 1.6 acres of roadway, and 3 residential lots, totaling 10.4 acres. At the present time there is no plan to develop the residential lots; however, their potential development is included in the present evaluation of the environmental aspects of storm water runoff from the development of the proposed project. The area on the makai side of the project is generally covered by hou bush, while the mauka area is primarily California grass.

The concern with industrial and urban development of undeveloped, agricultural, or rural land, such as herein proposed, is the potential changes in the quantity and quality of surface water (primarily storm water) that generally results from increasing the area of impervious surfaces, such as roof tops, roadways, parking lots, etc. Although it

# Oahu HYDROLOGY

## LEGEND

-  Saturated water available for domestic use  
Cap of 100 gpm/acre @ 150 feet
-  Unsaturated water available for domestic use  
Cap of 100 gpm/acre @ 150 feet
-  Capacity of storage available without recharge
-  Major streams
-  Potential stream or water course
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-  20' contour
-  30' contour
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-  60' contour
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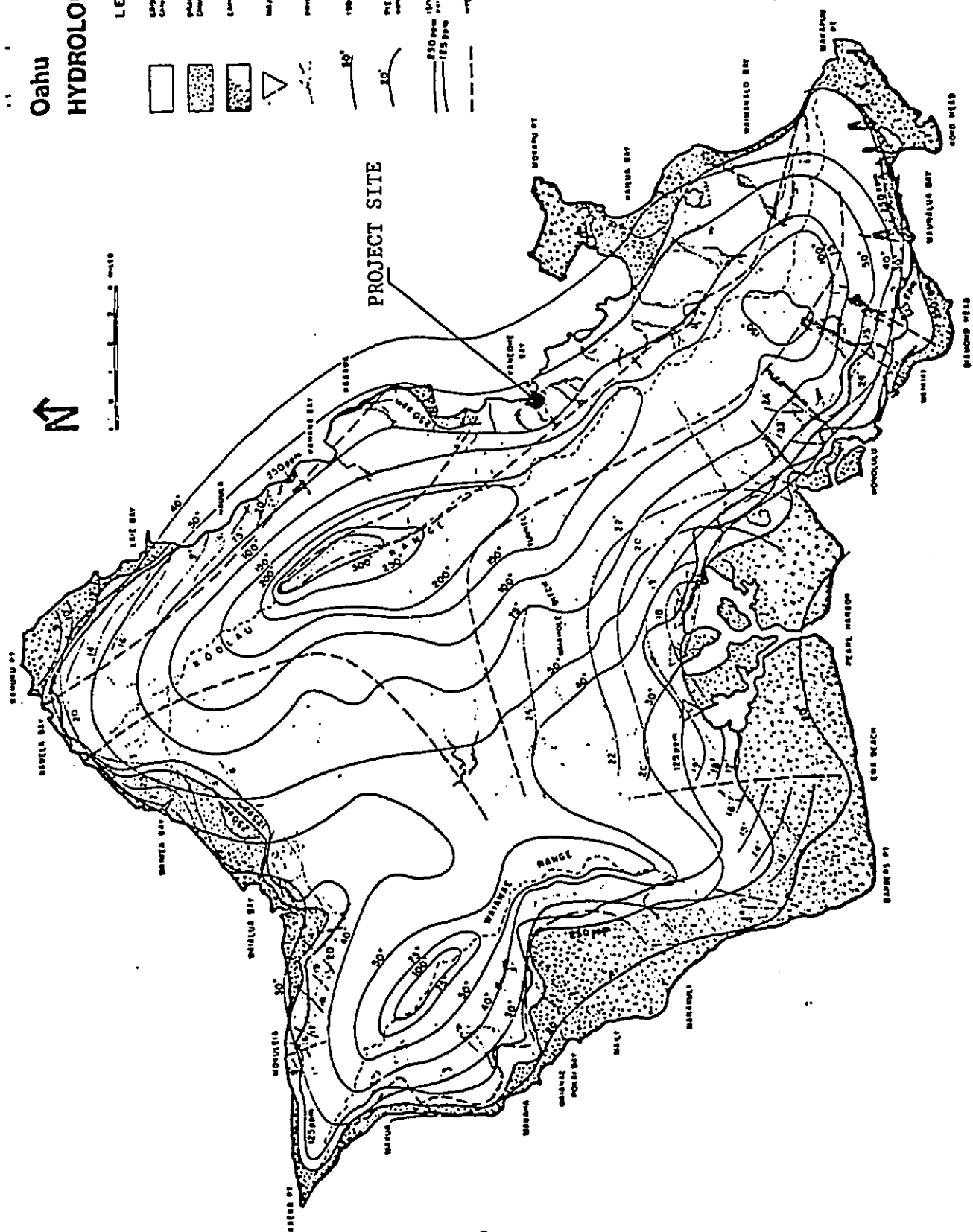


Figure 1, Hydrologic and Geologic Characteristics of Oahu  
(from "2020 Plan," Board of Water Supply, City and County of Honolulu, pg 13, February 1971)

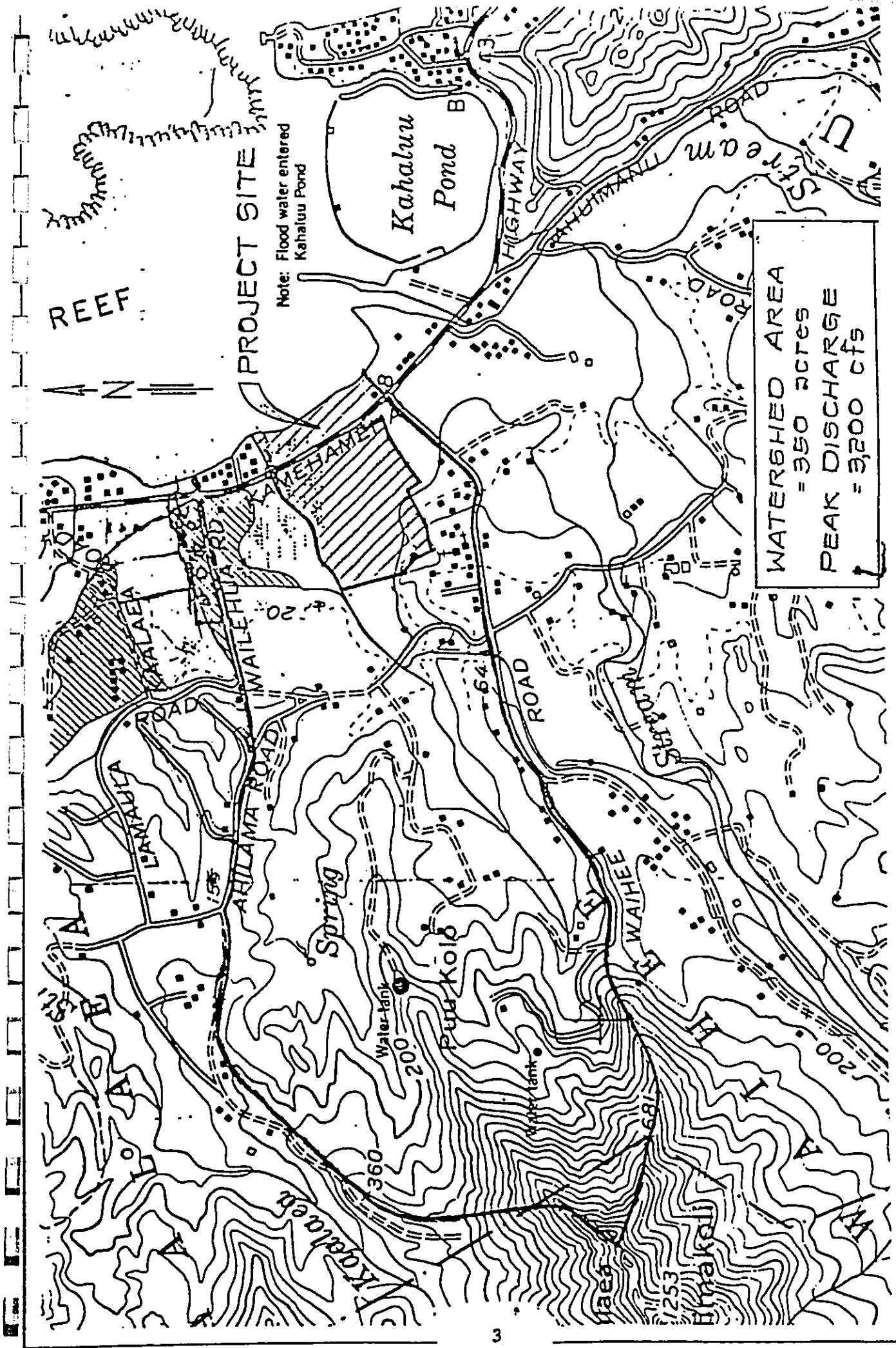


EXHIBIT III  
DRAINAGE BASIN

Figure 2.

Scale: 1" = 1000' (D&F CIVIL WORKS & ASSOC., 1981)

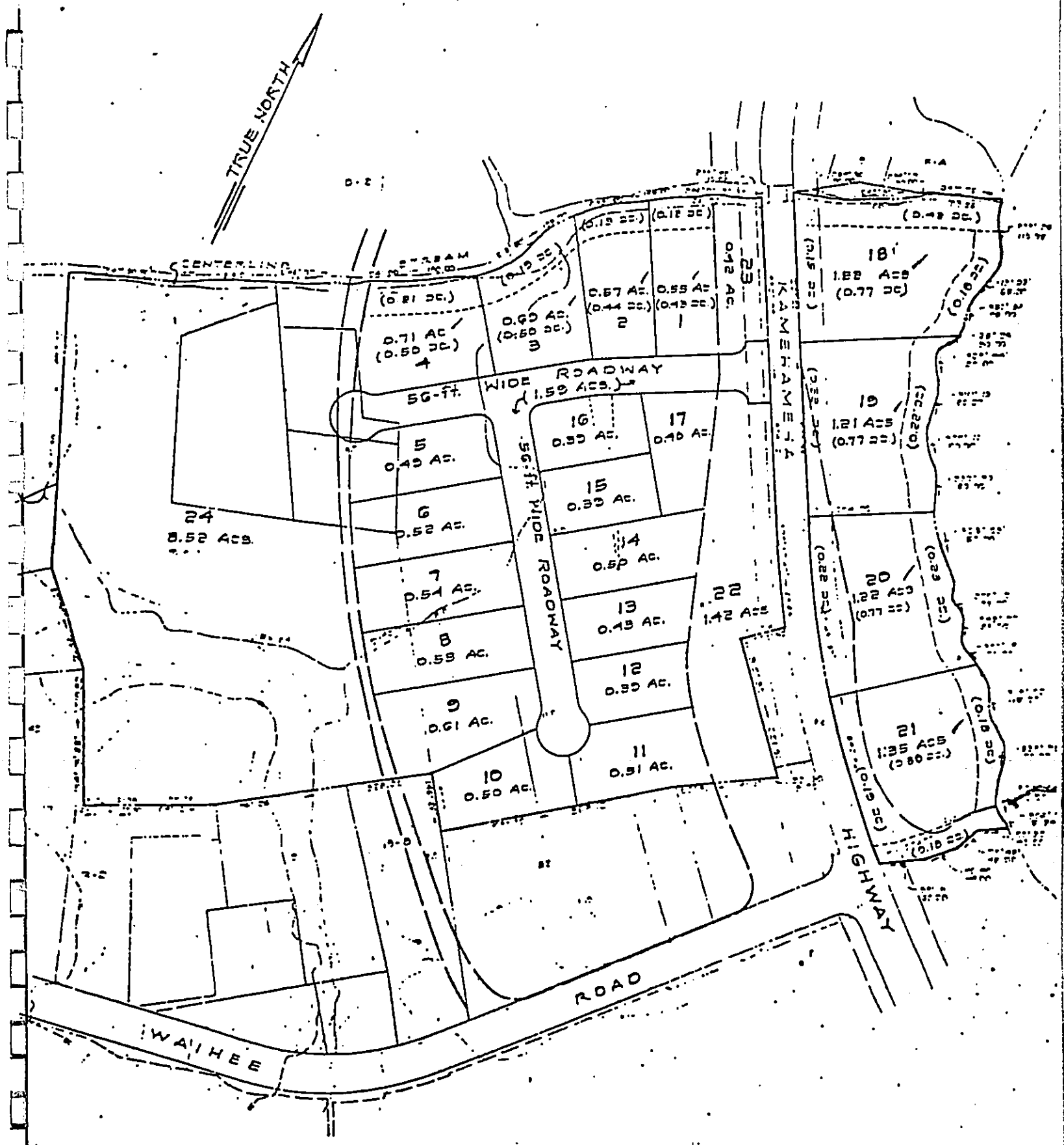


Figure 3.

EXHIBIT II.

PROPOSED SUBDIVISION



Scale in Feet (Ref. Gray, Wong & Assoc., 1981)

is not known at this time what the particular industries utilizing the lots will be, nor their lot development configurations, it is typically the situation that industrial areas will have a high percentage of impervious surfaces. For conservative reasons the entire industrial area is assumed to have the same impervious surfaces as roadways.

There are two main concerns relating to changes in surface water runoff: 1) public safety and property damage; and 2) environmental impact. The first concern requires the determination of changes in peak discharge rates, the magnitudes of which are necessary for designing adequate drainage structures to prevent flooding; while the second concern requires identification of the changes in total runoff volume, as well as sediment, nutrient, and other constituent loads, and the effects these will have on the ecosystem of the natural resources serving as the "sink," which in this situation would be the ocean via Kaneohe Bay. It is this second concern, environmental impact, and its probable effect on the subsequent receiving waters, that is under study in the present investigation.



## PURPOSE AND SCOPE

The purpose of this study is to evaluate the environmental impact of the proposed Kahaluu Industrial and Residential Development as it related to surface water runoff. From an assemblage of available baseline hydrologic and water quality data, an estimate of the existing and projected volume and quality characteristics of surface water runoff from the project site will be made, along with an assessment of the environmental impact resulting from this runoff.

## METHODOLOGY

### Assessment Procedure

The environmental impact of the proposed project as it relates to surface water runoff was evaluated by estimating the changes in runoff volume and contaminant load that would occur within the 26 acre site after project completion. This required the determination of storm runoff volumes and constituent quality and quantity loads, and their resulting increment changes for existing and developed (full) conditions.

### Storm Runoff Volume

Methods currently available to estimate surface water runoff volume from a specific storm event over a drainage area require the use of rainfall-runoff coefficients which are a function of storm intensity, storm duration, and hydrology factors such as land management practices, vegetative cover, soil type, soil moisture conditions, etc. This means that over a drainage area, a number of different rainfall-runoff coefficients would need to be determined to account for the varying hydrologic factors that would exist. More commonly, however, these differences are ignored in favor of a single coefficient for a particular land use over a given rainfall intensity range. While this approach is convenient, it is less representative of the actual situation.

In order to gain more representative estimates of storm runoff volume, a method developed by the Hawaii/Simulation Laboratory (HESL) of the University of Hawaii was utilized (Lopez, 1974; Lopez and Dugan, 1978).

The HESL method incorporates data from the U.S. Soil Conservation Service (SCS) and the U.S. Weather Bureau (1962). The SCS data includes soil maps (Foote et al, 1972) and curve numbers for various soil groups. These curve numbers have been obtained from empirical data (including precipitation, soil, changing soil moisture conditions, and vegetative cover) generated from the classification of thousands of soils throughout the nation. These soils have been classified into four groups, labeled A, B, C, and D, with Class A having the highest water intake rates and Class D the lowest. These curve numbers, modified for Hawaiian conditions, pertain only to non-urban conditions. For urban conditions, the HESL method utilizes information published by Miller and Viessman (1973).

#### Storm Runoff Quality

The water quality parameters of primary interest in this study include sediment, nitrogen, and phosphorus.

Inasmuch as there is no baseline water quality data for storm water runoff from the project site itself, nitrogen and phosphorus levels of 0.74 and 0.07 mg/L, respectively, were estimated for the present (1981) conditions. These values, which were based on information published by Loehr (1972), were derived from nitrogen outputs of 3 lb/acre-yr and phosphorus outputs of one order of magnitude less; an annual rainfall of 60 in; and a rainfall-runoff coefficient of 0.3.

Representative suspended solids values in storm water runoff from the project site under existing conditions are again difficult to determine inasmuch as it is commonly presumed, by mainly indirect methods,

that the majority of the annual suspended solid load is carried by the heavy storm water runoff events which tend to occur on an infrequent basis. For the present study, the concentration of suspended solids was based on the average measured and estimated suspended solids load per unit area from the streams flowing out of the entire Kaneohe Bay Drainage Basin, as reported by Jones et al.(1971). The suspended solids concentration was calculated to be 1300 mg/L, based on the same rainfall and runoff coefficient (60 in. and 0.3, respectively) as used for the nitrogen and phosphorus concentrations.

Quality data for urban storm water (post-development conditions) is sparse, both locally and nationally. Furthermore, the reported data have been highly variable and diverse. Loehr (1974) compiled urban storm runoff quality data collected from throughout the United States, as well as from a few international locations. Locally, Fujiwara (1973) reported urban storm water quality data collected from storm drains in different drainage areas of Honolulu, as shown in Table 1. For the present study, Fujiwara's results were used to simulate post-development runoff quality for nitrogen, phosphorus, and suspended solids, which were, respectively, 3.80, 2.17, and 12 mg/L for industrial development, and 0.60, 0.57, and 250 mg/L for residential development. Attention is likewise drawn to the heavy metal content measured in the industrial development and residential runoff.

#### Contaminant Loads

Applying the contaminant concentrations to the estimated runoff volumes yields the contaminant loads for both baseline and post-develop-

ment conditions. Having established the sediment and nutrient runoff loads for both the existing and proposed land uses, the changes in the loads were then computed and examined.

Table 1

Representative Storm Water Quality Data for Honolulu<sup>a</sup> (Fujiwara, 1973)

	<u>Residential<sup>b</sup></u>	<u>Commercial<sup>c</sup></u>	<u>Industrial<sup>d</sup></u>
Total Solids	511	278	246
Suspended Solids	252	142	12
COD	142	209	40
BOD	10	19	7
Dissolved Oxygen	7.1	5.7	6.7
NO <sub>3</sub> -N	0.211	0.045	1.1
TKN	0.381	0.272	2.70
Total P	0.57	0.53	2.17
Ortho P	0.27	0.19	1.27
Grease	2.8	1919	2.2
Lead	0.407	0.987	1.657
Chromium	0.013	0.021	0.013
Zinc	0.512	0.792	0.729
Copper	0.036	0.036	0.021
Iron	0.377	0.295	0.049
Total Coliform	83,300	33,500	11,500
Fecal Coliform	1,965	463	580
Fecal Strep	6,393	7,900	7,350

<sup>a</sup> All units in mg/l except total coliform, fecal coliform, and fecal strep which are listed as No./100 ml

<sup>b</sup> Storm water samples collected on Aupuni Street near Nuhelewai Stream

<sup>c</sup> Storm water samples collected at Beretania Street between Maunakea and River Streets

<sup>d</sup> Storm water samples collected near Iwilei and Pacific Streets

## DRAINAGE ASPECTS

North Waihee Stream, which bounds the north edge of the proposed project (Figures 2 and 3), is the smallest of 6 streams which flow into Kaneohe Bay between Kahaluu Pond and Pulama Road. These streams are relatively well-defined above approximately 30-ft elevation, but below this elevation the drainage area becomes generally broad directly mauka of Kamehameha Highway. Kamehameha Highway, along this stretch, is elevated 1-2 ft above the lands adjacent on each side of the Highway.

The existing drainage system for North Waihee Stream, under Kamehameha Highway, is inadequate to accommodate large storm water flows. This condition occurs at a point adjacent of the proposed project site (Gray, Hong & Assoc., 1981). According to Plate 6 of the City and County of Honolulu's Drainage Standards (1969) the 350 acre drainage basin of North Waihee Stream has a peak discharge of 3200 cfs. The existing drainage system under Kamehameha Highway at North Waihee Stream consists of two 5-ft x 12-ft box culverts, with the top of the box culvert being at elevation 6.0 ± ft (above msl), and the Highway surface at an elevation of 8.0-ft. Kaneohe Bay is approximately 300-ft makai of the Highway (Gray, Hong & Assoc., 1981).

Preliminary calculations by Gray, Hong & Associates (1981) indicate that the culverts can carry a flow of approximately  $1200\text{-ft}^3/\text{sec}$ . Above this the runoff will flow over Kamehameha Highway which in turn acts as a broad-crested weir. Basically two courses of action could be logically taken in order to proceed with the development: 1) raise the project site land surface above the flooding level, or 2) replace the restricting box culvert with a drainage structure of adequate size, along with stream improvements.

These two alternatives will have to be subsequently considered if the project is to proceed.

The project site soil is designated as Tropaquepts, which is not listed as being classified in one of the previous discussed SCS runoff groups, A through D (Lopez and Dugan, 1978). Tropaquepts are termed as "poorly drained" soils, which would seem to indicate that they should be designated as C or D, inasmuch as the nearby Pearl Harbor soil, classified as D, is rated as "very poorly drained." Thus, for conservative reasons the soils of the 26 acre project site were considered as representative of Class "C" soils



## RESULTS

The estimated storm water runoff and constituent changes due to the proposed Kahaluu Industrial and Residential Development project are shown in Table 2. The values presented, it must be emphasized, are for comparative purposes only, and are not intended to be representative of the accuracy implied by the practice of reporting results to one decimal place. This was done primarily for convenience of calculations and balancing.

### Storm Runoff Volume

As seen in Table 2, the storm runoff for the 1-yr/1-hr duration storm for post-development is 3.9 times greater than for pre-developed conditions; however, as the storm duration and recurrence interval increases, this difference reduces to 1.2. The primary reason for the diminishing differences in runoff volume for pre- and post-development conditions is that soil permeability decreases as storm magnitude increases. With low intensity and short duration storm events, the existing land use allows significant percolation to occur (even though these are poorly drained soils), and relatively little runoff is generated. However, as the storm intensity and duration increases, the ability of the soil to accept water decreases and greater runoff occurs, i.e., the soil becomes more impermeable. Thus, as the storm events increase in magnitude, the permeability conditions under the existing land use approaches, but does not reach, that representative of fully developed conditions.

Table 2

Estimated Storm Water Runoff Volume and Constituent Changes due to the Proposed Kahaluu Industrial and Residential Development, Kahaluu, Windward Oahu, Hawaii

Storm <sup>a</sup>		Storm Water Runoff												
Dur- ation hr	Recur- rence Interval yr	Quan- tity in.	Hydraulic			Nitrogen <sup>b</sup>			Phosphorus <sup>c</sup>			Suspended Solids <sup>d</sup>		
			Development		Δ	Development		Δ	Development		Δ	Development		Δ
			1981 AF event	Full AF event	AF event	1981 lb event	Full lb event	lb event	1981 lb event	Full lb event	lb event	1981 ton event	Full ton event	ton event
1	1	2.3	1.0	3.9	+ 2.9	2.0	29.5	+ 27.5	0.2	17.8	+ 17.6	1.77	0.46	- 1.31
1	5	3.3	2.3	6.0	+ 3.7	4.6	44.4	+ 39.8	0.5	26.7	+ 26.2	4.07	0.76	- 3.31
1	10	3.8	3.0	7.1	+ 4.1	6.0	51.3	+ 45.3	0.6	31.2	+ 30.6	5.30	0.91	- 4.39
1	25	4.3	3.8	8.2	+ 4.4	7.6	58.7	+ 51.1	0.8	35.7	+ 34.9	6.72	1.06	- 5.66
1	50	4.9	4.8	9.0	+ 4.2	9.7	66.8	+ 57.1	1.0	40.4	+ 39.4	8.49	1.10	- 7.39
1	100	5.2	5.3	10.1	+ 4.8	10.7	71.8	+ 61.1	1.1	43.8	+ 42.7	9.37	1.34	- 8.03
24	1	5.6	6.0	10.9	+ 4.9	12.1	77.8	+ 65.3	1.2	47.3	+ 46.1	10.61	1.45	- 9.16
24	5	10.0	14.3	20.4	+ 6.1	28.9	141.7	+ 112.9	2.9	86.9	+ 84.0	25.28	2.82	- 22.46
24	10	12.0	18.4	24.7	+ 6.3	37.0	170.9	+ 133.9	3.7	104.9	+ 101.2	32.53	3.45	- 29.08
24	25	14.0	22.4	28.9	+ 6.5	45.1	199.3	+ 154.2	4.5	122.4	+ 117.9	39.60	4.07	- 35.53
24	50	15.5	25.5	32.3	+ 6.8	51.3	222.1	+ 170.8	5.1	136.4	+ 131.3	45.08	4.57	- 40.51
24	100	18.0	30.8	37.7	+ 6.9	62.0	258.7	+ 196.7	6.2	159.0	+ 152.8	54.45	5.33	- 49.12

a) From U.S. Weather Bureau "Rainfall Frequency Atlas of the Hawaii Islands" (1962).

b) Based on a nitrogen value of 0.74 mg/L for 1981 conditions; and 3.8 mg/L and 0.60 mg/L, respectively, for industrial and residential development.

c) Based on a phosphorus value of 0.07 mg/L for 1981 conditions; and 2.17mg/L and 0.57 mg/L, respectively, for industrial and residential development.

d) Based on a suspended solids value of 1300 mg/L for 1981 conditions; and 12 mg/L and 250 mg/L, respectively, for industrial and residential development.

As would be expected, the greatest calculated incremental storm runoff volume (6.9 acre-ft) resulted from the 100-yr storm with a 24-hr duration. This volume of runoff averaged over the full 24-hr period would increase the runoff into the bay by less than 3.5 cfs. The peak magnitude of the 24-hr storm would, of course, be expected to occur over a shorter time period, which could double or even triple this value. However, this is insignificant compared to the design peak drainage discharge of 3200 cfs.

#### Contaminant Load

Besides the changes in the volume of storm runoff, the quantity of the various constituents being transported is of equal, if not more importance. However, as previously mentioned, estimates of water quality constituents resulting from a significant storm water runoff that occurs at the most only a few times a year is very perplexing, especially since only in recent years has information on this subject become available at both the local and national level.

The nitrogen, phosphorus, and suspended solids loads under both present and proposed land use conditions for storms of 1- and 24-hr duration at recurrence intervals of 1-, 5-, 10-, 25-, 50-, and 100-yr are shown in Table 2. It can be noted from Table 2 that the net change in nitrogen load ranges from an increase of 27.5 lb/event for the 1-hr/1-yr storm to 196.7 lb/event for the 24-hr/100-yr storm. For phosphorus, the net increase in load ranges from 17.6 lb/event for the 1-hr/1-yr storm to 152.8 lb/event for the 24-hr/100-yr storm.

With respect to suspended solids, Table 2, shows a net decrease of from 1.31 ton/event for the 1-hr/1-yr storm, to a 49.12 ton/event decrease for the 24-hr/100-yr storm.

It must be pointed out that the contaminant loads presented in this study are for comparative purposes only, and should not be taken as absolute values. They are intended to demonstrate 1) whether an increase or decrease in loads might be expected, and 2) the relative magnitude of these increases and decreases. The results of this study suggest that the output of nitrogen and phosphorus can be expected to increase somewhat in the runoff, while suspended solids should decrease.

Other water quality constituents of general concern include biocides and heavy metals. In general, the biocides in use today tend to break down more readily in comparison to the more long lasting types of a few years ago. Consequently, except for agricultural runoff, the types and concentrations are usually considered insignificant.

The long-term effects of heavy metals at the concentrations reported in Table 1 are not well-defined, despite the numerous studies on Kaneohe Bay water quality. To gain an insight into the significance of heavy metals a comparison can be made to the values required for potable (drinking) water.

In terms of heavy metals (Table 1) for post-residential-and-industrial development conditions: the chromium values of 0.013 mg/L, for both developmental conditions, are 1/4 the 0.05 mg/L maximum concentration limit for drinking water, as specified in the State of Hawaii "Potable

Water Systems" regulations (PHR, 1977) (which were based on the Federal Safe Drinking Water Act); the copper concentration of 0.036 and 0.021 mg/L, respectively, for residential and industrial developments are only a fraction of the 1.0 mg/L limit suggested in the National Secondary Regulations (USEPA, 1979) (Copper is not called out in the State of Hawaii regulations); the zinc concentrations at 0.512 and 0.729 mg/L, respectively, are about 1/10 and 1/6 of the 5.0 mg/L suggested limit in the National Secondary Drinking Water Regulations (not listed in the State of Hawaii regulations); the iron values of 0.377 and 0.049 mg/L, respectively, are slightly above and significantly below the 0.3 mg/L limit, for aesthetic reasons (color and taste), of National Secondary Drinking Water Regulations (not listed in the State of Hawaii regulations); and the lead concentration of 0.407 and 1.657 mg/L, respectively, are significantly higher than the State of Hawaii limit of 0.05 mg/L for drinking water. It is ultra-conservative to compare storm water runoff quality to that required for drinking water, but the prospective can be seen that lead is the metal of concern in storm water runoff.

With the national effort to remove or reduce the exposure of lead to the environment the largest potential source (presently) is generally alledged to be from the burning of leaded gasoline in internal combustion engines. However, new cars, especially since 1974, have been designed to only use unleaded gasoline, which is intended to reduce the output of lead to the environment. Thus, data is presently lacking, but the supposition is advanced that the concentration of lead from storm water

runoff should be steadily decreasing.

From the existing information on Kaneohe Bay, therefore, no detectable impacts attributable to heavy metals from the project site are expected. Furthermore, from most studies to date, Kaneohe Bay appears to be more sensitive to nutrient and sediment contamination.

This study has addressed the long-term impacts of the proposed project on storm water runoff and contaminant loads carried by the runoff. It is recognized that during construction, severe incidences of water pollution can occur as a result of grading activities, especially during wet weather periods. The primary pollutant would be suspended solids. The impact of construction activities can be minimized by adhering to strict erosion control measures, particularly those specified in the City and County of Honolulu's Grading Ordinance (1972) and in the State of Hawaii Department of Health's Water Quality Standards, Chapter 37-A (1979).

## SUMMARY AND CONCLUSIONS

The proposed Kahaluu Industrial and Residential Development is located at Kahaluu in Windward Oahu, Hawaii. The development site is intersected by Kamehameha Highway, and situated between Waihee Road and North Waihee Stream, which abutts the site's northern boundry. North Waihee Stream flows into Kaneohe Bay approximately 300-ft downstream of its junction with Kamemameha Highway.

The proposed 26 acre project site consists of 14 acres of industrial lots (21), 1.6 acres of roadway, and 10.4 acres of residential lots (3). There are no present plans to develop the residential lots, but they are included in the present evaluation for conservative reasons. The project site area receives a mean annual rainfall of approximately 60-in.

The purpose of this study was to evaluate the environmental impact that the proposed Kahaluu Industrial and Residential Development is estimated to have on the quality of storm water runoff for 1-hr and 24-hr storms at several recurrence intervals that range from 1-yr to 100-yr.

The development of the 26 acre site is projected to increase the volume of storm water runoff from 2.9 acre-ft for the 1-hr/1-yr event to 6.9 acre-ft for the 24-hr/100-yr event. These changes, however, result in increases of nearly 3.9 and 1.2 times, respectively, for (1981) undeveloped and (full) developed conditions. The maximum peak discharge rate increase should be  $\leq 60$  cfs, which is insignificant in comparison to the 3200 cfs required for design purposes for the 350 acre Waihee drainage basin. These changes will, of course, manifest themselves in the constituent loads. Incremental comparisons were based only on the 26 acre project site itself, rather than on the 350 acre drainage basin.

Based on the literature, local studies, and reasonable assumptions the quality of the major constituents studied (nitrogen, phosphorus, and suspended solids) for undeveloped conditions were ascertained to respectively be: 0.74 mg/L for nitrogen; 0.07 mg/L for phosphorus; and 1300 mg/L for suspended solids. For (full) development residential and industrial conditions: nitrogen was determined to be 0.60 and 3.80 mg/L, respectively; phosphorus 0.57 and 2.17 mg/L, respectively; and suspended solids 250 and 12 mg/L, respectively. The incremental changes for nitrogen showed an increase of 27.5 to 196.7 lb/event for the standard storms (1-hr/1-yr ---24-hr/100-yr). Phosphorus likewise incrementally increased from 17.6 to 152.8 lb/event for the standard storms. Suspended solids, on the other hand, decreased from 1.31 to 49.12 ton/event, for the 1-hr/1-yr and 24-hr/100-yr storms, respectively.

The constituent loads, it needs to be emphasized, are not considered as absolute, but rather they should be utilized to demonstrate trends. Following this, the development of the proposed project site should increase the nitrogen and phosphorus output somewhat for most storms, while the suspended solids should decrease.

Besides the aforementioned constituents there are concerns over potential changes in the output of biocides and heavy metals. Biocide data is quite limited for natural and urban runoff situations. In general the biocides presently in use tend to breakdown more readily in comparison to the more lasting types of a few years ago; consequently, except for agricultural runoff, the types and concentrations are usually considered insignificant.



The long-term effects of heavy metals at the concentrations reported in this study are not well-defined, despite the numerous studies on Kaneohe Bay water quality. However, with the exception of lead most of the analyzed heavy metals are below the limits required or recommended for drinking water. Based on local derived storm water data, for 1972-1973, the concentration of lead is significantly higher than that acceptable for drinking water, although comparing the quality of storm water to drinking water is ultra-conservative. However, new cars, especially since 1974, have been designed to only use unleaded gasoline, which is intended to reduce the output of lead to the environment. Thus, data is presently lacking, but the supposition is advanced that the concentration of lead from storm water runoff should be steadily decreasing. No detectable impacts attributable to heavy metals are expected. From most studies to date, Kaneohe Bay appears to be more sensitive to nutrient and sediment contamination.

This study has addressed the long-term (full) developed impacts of the proposed project on storm water runoff and the contained constituent loads. It is recognized, however, that during construction, potential severe incidences of water pollution could occur as a result of grading activities, especially during storm conditions if proper erosion control measures are not intensively followed.

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APPENDIX E

AIR QUALITY STUDY

(This appendix has been included in whole as contained in the Kahaluu  
Commercial and Residential Development EIS as prepared by Barry D. Root.)

# APPENDIX B

DRAFT

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AIR QUALITY STUDY  
FOR THE PROPOSED  
KAHALUU COMMERCIAL AND RESIDENTIAL DEVELOPMENT

Prepared by

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JUNE 1981

**I. PROJECT DESCRIPTION**

The proposed project involves site preparation and construction of a 74-acre shopping center/parking area and a 21-lot subdivision on a 15.3-acre site located in Kahaluu as shown in Figure 1. Detailed plans are illustrated in a series of site maps attached as Appendix A (Figures 2, 3, 4 in the EIS). Access to the site will be via both Kamohamcha Highway and Waialeale Road. The proposed project site is currently vacant and either covered with vegetation or graded and used as storage for dredged material from the adjacent newly-constructed lagoon.

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## II. SCOPE OF WORK

The purpose of this study is to discuss relevant air pollution control standards and regulations as they apply to the planned projects to estimate present air quality in the project area; to evaluate future air quality in terms of use of the site as a residential/commercial area; to predict short- and long-term impacts that the project could have on the local atmospheric environment; and to discuss potential mitigative measures that could be employed to avoid or lessen these impacts.

## III. AIR QUALITY STANDARDS

State of Hawaii and Federal Ambient Air Quality Standards (AQSS) have been established for seven classes of pollutants (Table 1). An AQSS is a concentration not to be exceeded over specified sampling periods which vary from pollutant to pollutant. Each of the regulated pollutants has the potential to cause some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration. Federal AQSS have been set at levels below those known to cause adverse effects, but State of Hawaii AQSS have been set at significantly lower levels for most pollutants. Federal AQSS have been divided into Primary and Secondary levels. The Primary AQSS are designed to prevent adverse health impacts while Secondary AQSS refer to welfare impacts such as decreased visibility, damage to vegetation, animals, or property, diminished comfort levels, or a reduction of the aesthetic values associated with good air quality. Each Federal AQSS is a level not to be exceeded more than once per year, but State of Hawaii AQSS are specified as levels not to be exceeded at any time.

Federal research regarding the adequacy of current AQSS is ongoing. At present there is an EPA proposal to lower the one-hour Federal AQSS for carbon monoxide from 35 parts per million (40 milligrams per cubic meter) to 25 parts per million (about 29 milligrams per cubic meter).

There is presently a desire on the part of the State of Hawaii air pollution control agency (Department of Health) to eliminate State AQSS for those pollutants covered by Federal Prevention of Significant Deterioration (PSD) Regulations. These regulations apply to areas where the Federal AQSS are currently being met. With the exception of small areas in the vicinity of major power generating facilities most of the State of Hawaii falls within this category. For purposes of PSD regulations, air pollutants have been divided into two categories: PSD Set I and PSD Set II. PSD Set I includes particulate matter and sulfur dioxide. The PSD Set II pollutants are carbon

monoxide, hydrocarbons, lead, nitrogen oxides, and ozone.

PSD Set I regulations were issued in June, 1978, and require use of best available control technology (BACT) for all major new sources of particulate matter and sulfur dioxide. Specific increments are set for how much additional degradation will be permitted in specific areas. Under these regulations there are three types of areas considered: Class I areas where maximum protection of existing air quality is desired, Class II areas where some degradation of existing air quality can be tolerated, and Class III areas where heavy industrialization and associated air quality degradation will be permitted (within specified limits). Most of Oahu and all of the project area, is designated as Class II. Since no major new sources of particulate or sulfur dioxide emissions are associated with this particular project, the PSD Set I regulations are important only in that they should prevent any serious increase in the levels of these particular pollutants because of the establishment of new emission sources outside the project boundaries.

PSD Set II regulations are now in the process of being developed. The Set II pollutants are emitted primarily by mobile sources and will thus require a more comprehensive regulatory approach.

It is not anticipated that the PSD Set II regulations will be promulgated in time to affect planning for this particular project, but once promulgated such regulations could have the effect of limiting emissions of these pollutants from emission sources or source areas outside the project boundary.

During the next few months the Federal Clean Air Act is being reviewed by Congress. This review process could result in substantial revisions to existing goals and the regulatory means to achieve them. At this point it is impossible to predict what impact, if any, this review process will have on both Federal and State rules and regulations regarding the direct or indirect air pollutant emissions associated with this project. For purposes of this study it will be

assumed that existing Air Quality Standards will apply at least through the construction phase of the project.



#### IV. PRESENT AIR QUALITY

There are no ambient air quality monitoring stations within the immediate vicinity of the proposed project. For a windward, shoreline area such as this with no industrial activity upwind for thousands of miles it seems reasonable to assume that present air pollutant levels are very low. There are no air pollutant emission sources within the project area (other than temporary piles of dredged material from the lagoon adjoining the property). The only significant sources of man-made air pollutants are motor vehicles traveling along Kamehameha Highway and Waiher Road adjacent to project boundaries.

Natural air pollutant producers which might affect air quality in the project area include the ocean (sea spray), plants (aero-allergens), dust, or perhaps a volcanic eruption on the Island of Hawaii. Concentrations of air pollutants from these sources should be fairly uniform for most windward Oahu shoreline locations. There is no agricultural activity requiring open field burning in the project area.

The only long-term air pollution monitoring station along the windward Oahu coast is located in Waimanalo, about 12 miles southeast of the project site (Figure 2). A summary of particulate measurements collected at this location is presented in Table 2. Average readings of particulate levels at Waimanalo are only about one-half of allowable annual levels and the 24-hour AQS has not been exceeded there since monitoring began in 1975.

#### V. SHORT-TERM AIR QUALITY IMPACT OF PROJECT CONSTRUCTION

During the site preparation and construction phases of this project it is inevitable that a certain amount of fugitive dust will be generated. Field measurement of such emissions from apartment and shopping center construction projects has yielded an estimated emission rate of 1.2 tons of dust per acre of construction per month of activity. This figure assumes medium level activity in a semi-arid climate with a moderate silt-silt content. In fact, it is nearly impossible to predict daily emission levels of particulates from this source. Since the construction area is fairly level, grading and dirt-hauling activities should be minimal.

It is also inevitable that construction equipment used on site will emit some air pollutants in the form of engine exhausts. The largest equipment is generally diesel-powered. For this equipment, individual carbon monoxide emission rates are no greater than those for an average automobile, but nitrogen dioxide emissions can be quite high. Fortunately, nitrogen dioxide emissions from other sources in the area should be minimal and overall pollutant emissions from construction equipment should be minor compared to levels generated on nearby Kamehameha Highway.

#### VI. AIR QUALITY IMPACT OF INCREASED ENERGY UTILIZATION

With about 96,000 square feet of commercial/retail area the proposed complex could be expected to require about 257,000 Kwh of electricity per month. The electrical demand of the 21 private residences (when eventually constructed and occupied) should be a much smaller 8,000 to 10,000 Kwh per month. If all this demand is met by burning fuel oil the incremental requirement could be as much as 560 barrels of oil per month. Hawaiian Electric Company, however, will have some future options available to meet this demand other than burning fuel oil. These include Wind Farms further up the coast on the North Shore at Kahuku and the possibility of a Ocean Thermal Energy Conversion Plant off the leeward coast. Should all the demand be met by burning fuel oil, the major air quality impact is likely to be increased sulfur dioxide and particulate levels in the Kahe Power Plant area on the Waianae coast.

#### VII. AIR QUALITY IMPACT OF INCREASED TRAFFIC

Once the proposed Kahaluu Commercial and Residential Development is completed the complex in itself will not produce any air pollutant emissions other than small air conditioner losses and periodic cooking aromas. But by serving as an origin and destination for various vehicular shopping trips, the project will be an indirect contributor to increased air pollutant levels in the area.

Motor vehicles are major sources of carbon monoxide, hydrocarbons and nitrogen oxides. Those using fuel which contains lead as an additive emit some airborne lead as well. The major control measure designed to reduce vehicular lead emissions is a Federal law requiring the use of unleaded gasoline in most new automobiles. As older cars are gradually removed from the vehicle fleet, lead emission should decrease substantially. Federal control regulations also call for increased efficiency in removing carbon monoxide from vehicle exhausts. By the year 2000, carbon monoxide emissions from the vehicle fleet then operating should be about half the levels now emitted. Decreases in hydrocarbon and nitrogen oxide emissions have been manifested as well.

With increasing pressure to achieve greater fuel economy and to aid economically-troubled U.S. automakers, there will be a continuing tendency on the part of the U.S. Congress to relax or even eliminate some existing air pollutant emission control goals. It is thus difficult to forecast future vehicular emission rates with any degree of certainty. It does seem logical to conclude, however, that if each year's crop of new vehicles burns less fuel to travel the same distance, then fleet emissions should also decrease each year as older, less efficient vehicles are removed from the roadways.

To gain an overview of the general trends that currently mandated control measures are likely to produce in the project area, a mesoscale vehicular emissions analysis has been carried out.

#### A. Emissions Analysis

For this analysis, a one mile segment of Kamehameha Highway adjacent to the intersection with Waialae Road is considered. The project is not likely to be completed before 1982, but for comparison purposes that year is used as the starting date for maximum project-related traffic. The traffic study for the project indicates that the completed project is likely to generate 4,382 trips along this roadway on a 24-hour basis, while probable 24-hour volumes for Kamehameha Highway are expected to be 14,113 in 1982, 19,772 in 1990, and 27,222 in 2000.

In fact these forecast travel levels do assume some growth because of projects constructed in business-served property such as this, but to show maximum possible impact the forecast project-related traffic has been added directly to those published forecasts to yield expected future pollutant emission levels with and without the project.

Vehicular emission rates were determined using Table F-15 of EPA's Mobile Source Emission Factors (1978), which contains the following inherent assumptions:

- (1) a vehicle mix that is 88.2 percent automobiles with the remainder being light trucks and vans;
- (2) average ambient temperature of 75° Fahrenheit;
- (3) average vehicle speed of 19.6 miles per hour; and
- (4) 20.6 percent of the vehicles operating under cold start conditions.

To allow for potential abatement of planned emission reductions, values for 1981/1982 were calculated using published 1980 estimates, and those for 1990 were based on 1987 estimates, and those for the year 2000 on 1995 estimates.

Results of this analysis are shown in Figure 3. There will clearly be an increase in vehicular emissions of carbon monoxide.

hydrocarbons, and nitrogen dioxide along Kamehameha Highway if the project is completed as planned, but the difference in hydrocarbon and nitrogen dioxide emissions with or without the project are very small. The greatest impact of increased traffic from the project will obviously be in the form of increased carbon dioxide emissions.

Although Figure 3 shows that some decrease in carbon monoxide emissions from present levels can be expected in the late 1980's whether the project is constructed or not, it is not possible to compare these emissions directly to State and Federal AQIS without carrying out a more detailed microscale analysis.

#### B. Carbon Monoxide Concentration Analysis

Three receptor sites in the project area were selected for detailed analysis (see Figure 1). Site 1 was selected because it represents the closest buildings to the proposed project (Key Project) and is a good indicator of concentration levels likely to occur in the proposed residential subdivision mauka of the shopping center. Site 2 is the only major intersection in the project area. Site 3 will become a significant intersection once the project is completed. Sites 2 and 3 are presently uninhabited, but they were selected to assess the highest traffic-related carbon monoxide levels likely to exist in the area under adverse meteorological conditions.

Detailed traffic counts for Kamehameha Highway and Waialae Road were conducted on a three day weekend in June 1981. From these counts it was determined that peak volume on Kamehameha Highway occurs on Saturday afternoons from 2:00 to 3:00 p.m. At this time the vehicular mix is 86 percent automobiles, 10 percent light duty trucks less than 6,000 pounds gross vehicle weight (GVW), and 5 percent light duty trucks greater than 6,000 pounds GVW, and 1 percent diesel buses. The same mix is assumed for Waialae Road with 85 percent automobiles and no buses. Peak volume on Waialae Road actually occurs on weekday mornings from 7:00 to 8:00 a.m.

Worst case wind direction for Site 1 was east northeast (a very common occurrence in this area). For Site 2 the worst case wind direction was south (fairly rare), and for Site 3 it was west (also rare). Values computed are for a height of 1.5 meters (breathing level) at a distance of 2 meters from roadways.

From the traffic consultant's study probable peak volumes for each of the roadways was used for the 'without project' computations and a peak hour volume of 506 shopping-related computations and 14 residential-related vehicles were added to produce 'with-project' volumes. The shopping volume was divided equally between each of the approach directions and between each of the potential commercial access routes. All the residential volume was assigned to Wahee Road.

Results of the peak-hour computations are shown in Figure 4. Estimated carbon monoxide levels with or without the project are within State and Federal Standards. The traffic consultant has concluded that traffic volumes on Kamehameha Highway should warrant a widening effort to four lanes sometime after 1990. The air quality analysis considered both the two- and four-lane configuration for Kamehameha Highway and found only slight improvement for the four-lane configuration assuming traffic can continue to flow at 35 mph. If traffic congestion occurs and speeds on Kamehameha Highway in the vicinity of the Wahee Road intersection are reduced to less than 10 mph, then carbon monoxide levels above the peak hour State of Hawaii AQS can be expected to occur in any year until the late 1990's.

Results of the peak eight-hour carbon monoxide analysis are shown in Figure 5. For this analysis, two correction factors are applied to the results shown in Figure 4. The first is a meteorological persistence factor of 0.6 recommended in EPA Guidelines as a way to estimate the greater variability in wind flow that would occur over an eight-hour time period as compared to a single one-hour period. The second factor reflects the fact that the average eight-

but the weekend afternoon time period was selected for analysis because combined volume on Kamehameha Highway and Wahee Road is greatest then and the proposed shopping center would have a low traffic volume early in the morning on weekdays.

Vehicle speeds on Kamehameha Highway past the project area average 35 mph in unrestricted flow. Traffic on Wahee Road has a stop sign at Kamehameha Highway and it is assumed that the new entrance/exit points to the shopping center will also have stop signs. Traffic upstream from the stop signs and moving within the parking area is assumed to travel at average speeds of 5 mph while traffic downstream from turns and stop signs is assumed to travel at 15 mph.

Vehicular carbon monoxide emissions for 1981, 1982, 1990, and the Year 2000 were determined using a Federal Highway Administration tabulated version of the Environmental Protection Agency's computerized Mobile Source Emissions Model (MOBILE 1). For the mid-afternoon traffic situation considered here an ambient temperature of 80° Fahrenheit was assumed with 10 percent of the vehicles operating in the cold start mode.

The EPA computer model HIWAY was used to estimate resulting carbon monoxide concentrations at the selected receptor sites with or without the increased traffic expected to be generated by the proposed project. Stability category is the most likely to prevail in the afternoon in a suburban area such as this. A uniform wind speed of one meter per second was used to simulate worst case windflow but the worst case wind direction was determined based on the geometry of the pollutant-contributing areas near each of the receptor sites. The analysis specifically included 3 source areas for each site--Kamehameha Highway, Wahee Road, and the parking area (which was treated as a wide line source).

Carbon monoxide contributions from source areas not directly considered in the analysis were assumed to be minimal and a background carbon monoxide level of zero was used in the analysis.

## VIII. MITIGATION MEASURES

### A. Short-Term

hour traffic flow is considerably less than the peak hour volume. For Kamehameha Highway and the parking and access points within the project this figure is 0.85, for Waiehe Road there is no correction factor since the average eight-hour volume on a weekend is not significantly different from the volume which occurs during the 2 to 3 p.m. period used in the analysis. As shown, computed eight-hour levels are all within acceptable AQS.

As indicated by the foregoing analysis, the only direct adverse air quality impact that the proposed Kahaluu Commercial and Residential Development is likely to create is the emission of fugitive dust during the construction phase of the project. State of Hawaii Department of Health Rules and Regulations (Chapter 43, Section 10) stipulate the control measures that are to be employed to reduce this type of emissions. Primary control consists of wetting down loose soil areas with water, oil, or suitable chemicals. An effective watering program can reduce particulate emission levels from construction sites by as much as 50 percent. Other control measures include good house-keeping on the jobsite and pavement or landscaping of bare soil areas as quickly as possible. Since there is no housing in the immediate area of the project these control measures should be adequate to insure that construction dust is not a problem.

### B. Long-Term

Once completed, the Kahaluu Commercial and Residential Development is expected to have little direct impact on the air quality of the surrounding region. The only potential long-term indirect air pollution contributions will be in the form of increased power plant emissions to provide electricity to the project and increased exhaust emissions from the traffic attracted to the project.

Planners for the project can do very little to mitigate either of these potential impacts. It would be possible to cut down electrical requirements a bit by installing solar water heaters for restaurants and other water users in the commercial portion of the project and it is likely that many of the private homes will have such heaters installed. Theoretically it is also possible that the project could install its own wind-energy system, but at present it is not clear that such action would be viable from an economic standpoint.

The planned 115-foot buffer area between the project area and Kamehameha Highway is clearly an effective air pollution mitigative measure since air pollution concentrations decrease exponentially with distance from the source. If the buffer area is planted with sufficiently dense landscaping it can serve to screen some particulates and carbon monoxide from the air.

Planners, however, can do very little to decrease emission levels from vehicles operating within or near the project area. It is also not in the best interest of a commercial project such as this to attempt to restrict vehicular traffic through the area. The only other way to potentially decrease vehicular emissions associated with the project is to insure easy and unimpeded traffic flow through the parking area and in and out the access routes. To this end it would be undesirable to install traffic lights at either of the proposed access routes since vehicular emissions increase dramatically in the vicinity of traffic signals. The addition of a left-turn lane on Kamehameha Highway at Wahee Road would help to expedite traffic flow at this critical intersection and would probably constitute the most constructive mitigative measure that could be undertaken to reduce air pollutant emissions in the project area.

Except during periods of exceptional traffic congestion, however, pollutant concentrations from vehicular sources in and around the project are expected to be within allowable air quality standards and no other mitigative measures seem necessary.

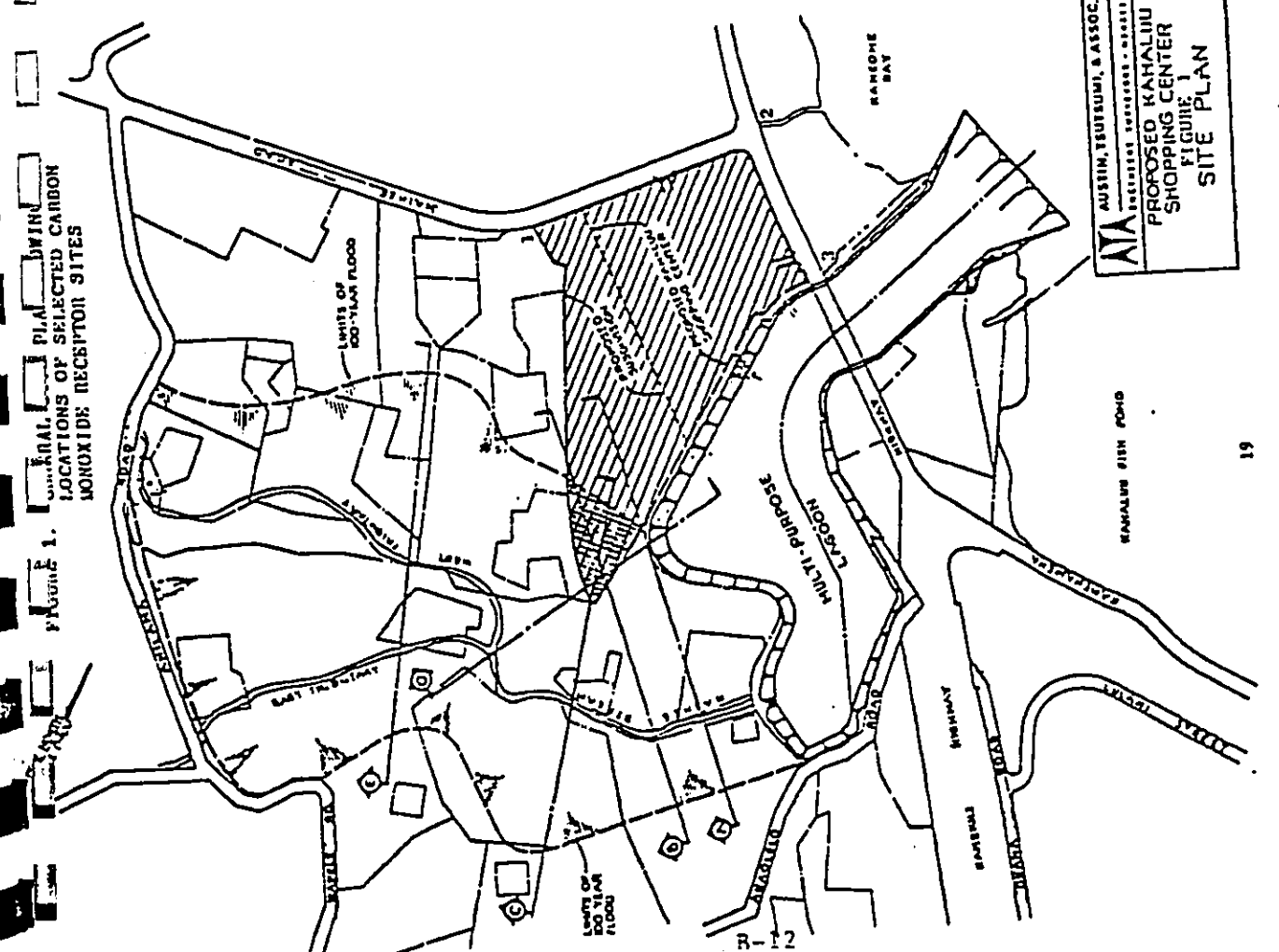
#### IX. SUMMARY

1. The proposed Kahalaui Commercial and Residential Development involves construction of a shopping center and 21 residential lots on a 15.3-acre site near the intersection of Kamehameha Highway and Wahee Road. The site is presently vacant.
2. Present air quality in the project area is estimated to be very good since there are no major contributing sources other than vehicles traveling on roadways along this part of the windward Oahu coast.
3. Except for short-term dust emissions during the construction phase of the project no significant direct air quality impacts are expected.
4. Indirect air quality impacts are likely to result from demands for electrical energy. The most likely impact will be in the area of the Kaha Power Plant in the Waianae area where slight increases in particulates and sulfur oxide emissions can be expected.
5. Increased traffic generated by the project will increase carbon monoxide, hydrocarbons and nitrogen dioxide in the project area and along Kamehameha Highway. Except during periods of severe traffic congestion, however, predicted levels of these pollutants are expected to be within allowable State and Federal Ambient Air Quality Standards.
6. Adequate mitigative measures are available to control emissions of fugitive dust from construction activities and a large, densely landscaped buffer zone between the project and Kamehameha Highway can help to remove some vehicle-generated pollutants from the air, but no special mitigative measures seem necessary to ensure that air quality standards will be met by the project as proposed.

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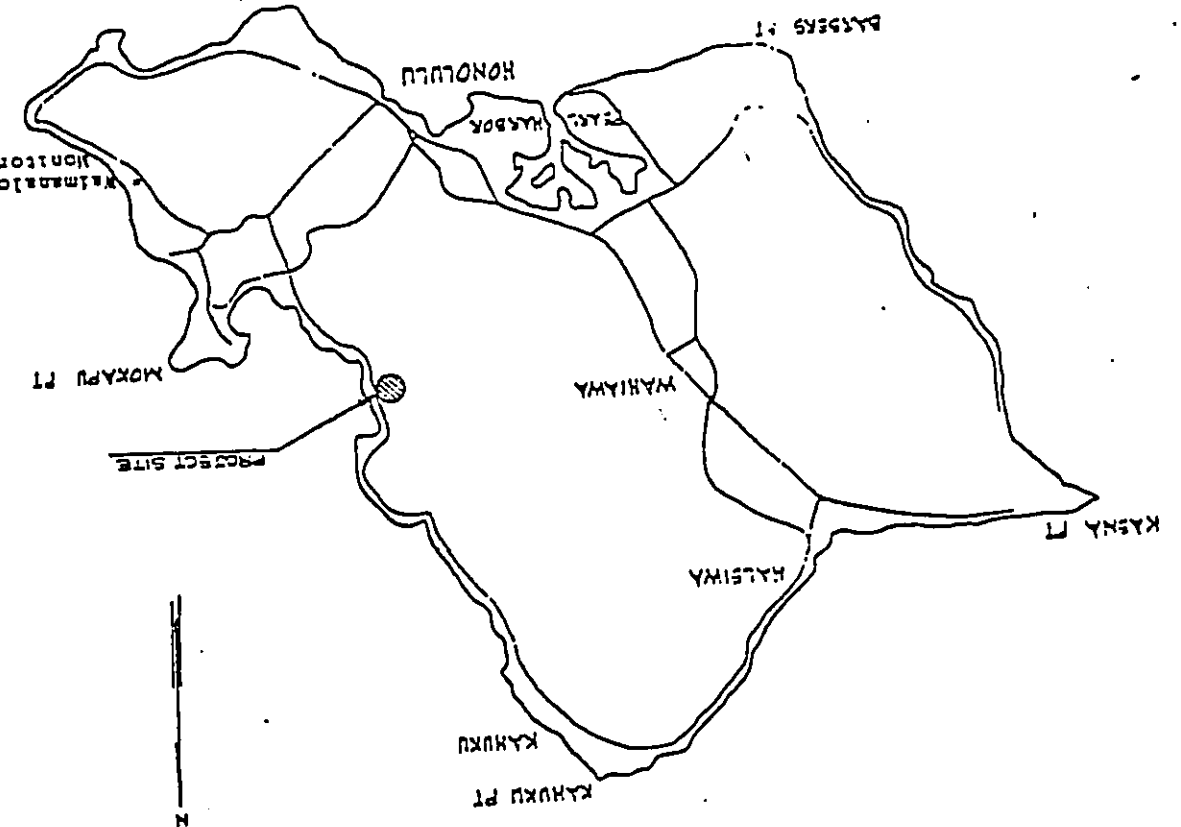
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FIGURE 1. GENERAL PIA DRAIN LOCATIONS OF SELECTED CARBON MONOXIDE RECEPTOR SITES



LOCATION MAP KOLAUPONO, OAHU, HAWAII

FIGURE 2. LOCATION MAP SHOWING NEAREST AIR POLLUTION MONITORING STATION





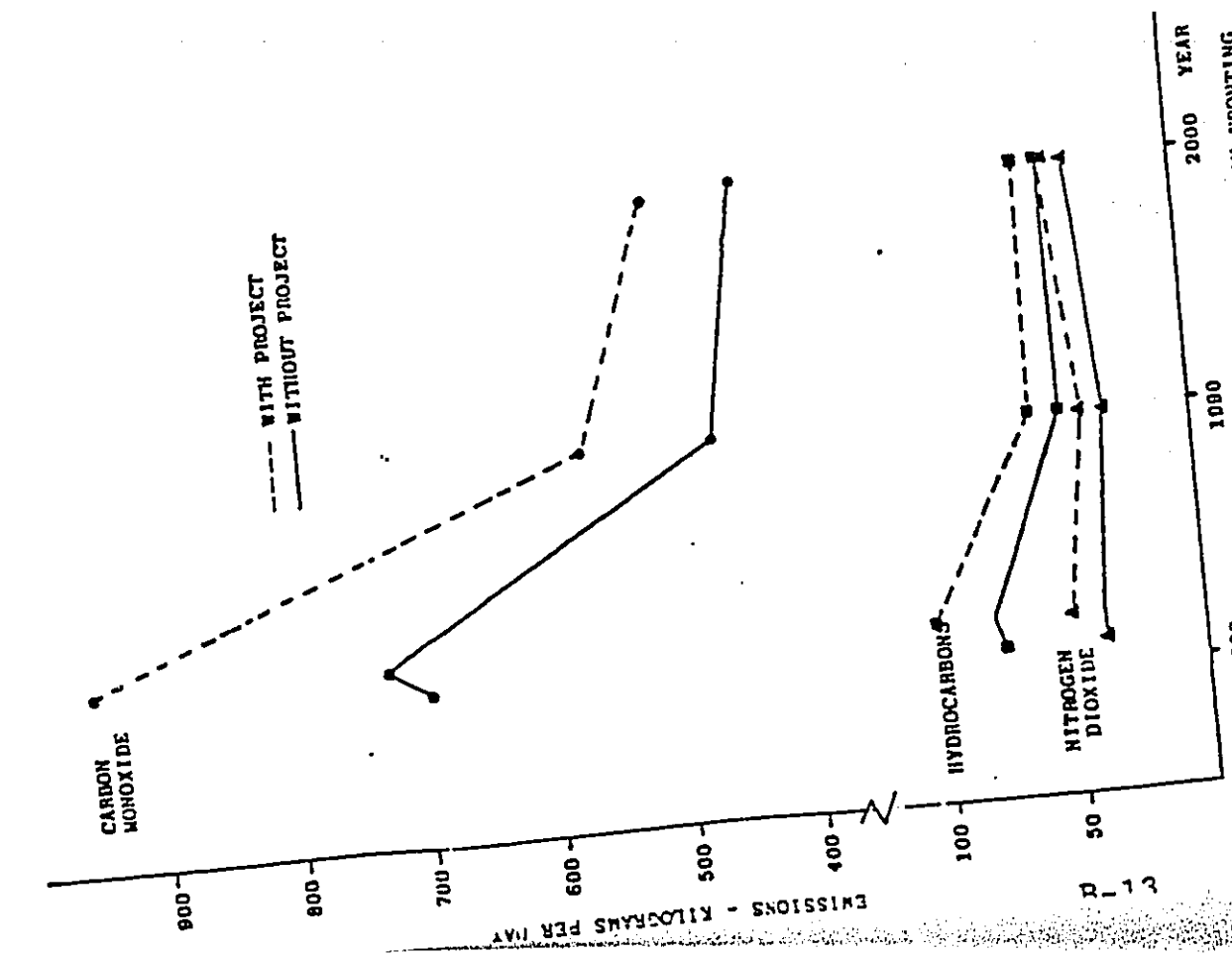


FIGURE 3. EMISSIONS ANALYSIS - KAMEHAMEHA HIGHWAY FRONTING PROJECT SITE

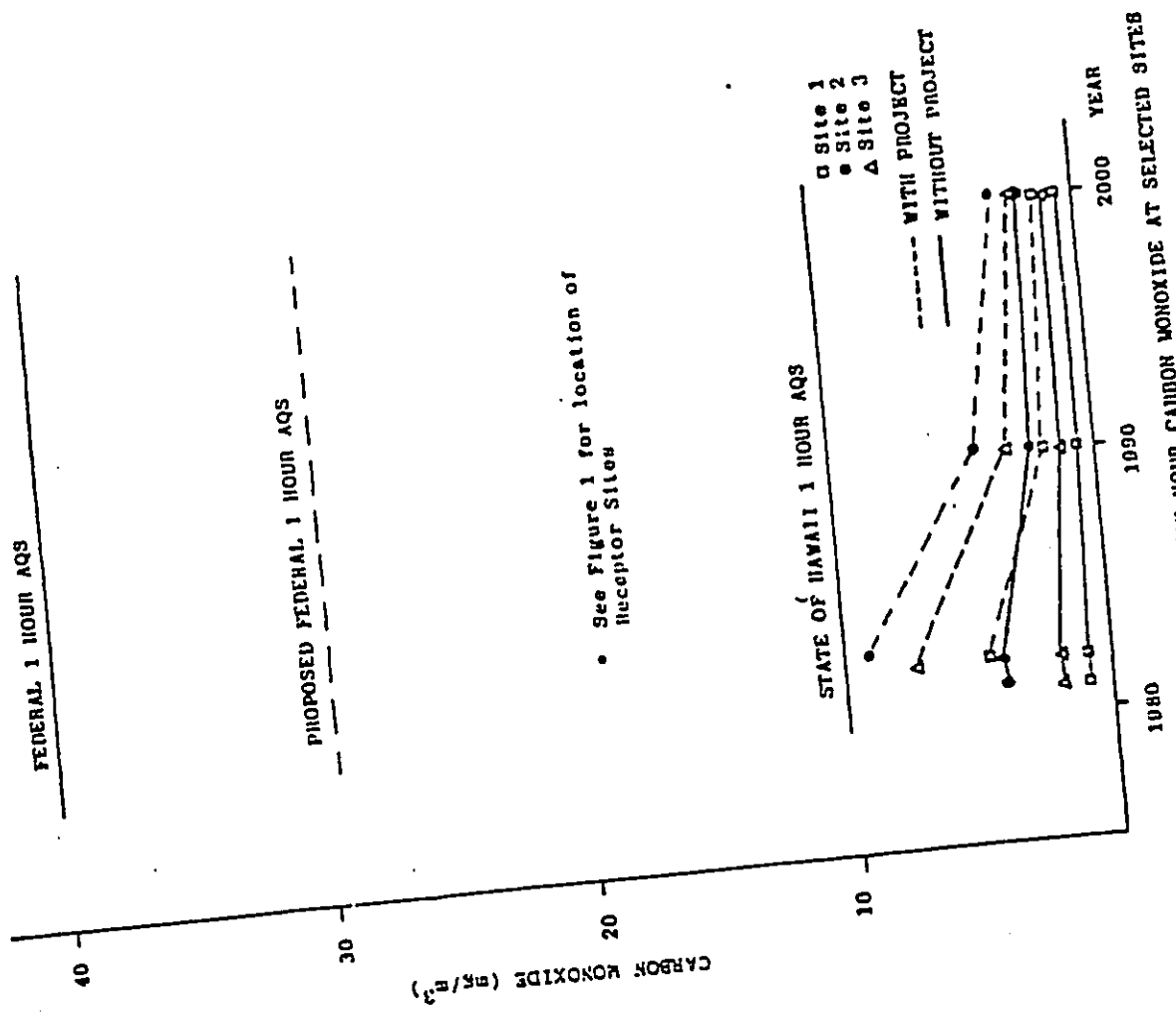


FIGURE 4. ESTIMATED PEAK HOUR CARBON MONOXIDE AT SELECTED SITES IN PROJECT AREA

TABLE 1  
SUMMARY OF  
STATE OF HAWAII AND FEDERAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	SAMPLING PERIOD	FEDERAL STANDARDS		STATE STANDARDS
		PRIMARY	SECONDARY	
1. Suspended particulate matter (micrograms per cubic meter)	Annual Geometric Mean	75	60	-
	Annual Arithmetic Mean	-	-	55
2. Sulfur Dioxide (micrograms per cubic meter)	Maximum Average in any 24 hours	260	150	100
	Annual Arithmetic Mean	80	-	20
3. Carbon Monoxide (milligrams per cubic meter)	Maximum Average in any 24 hours	365	-	80
	Maximum Average in any 3 hours	-	1300	400
4. Hydrocarbons Non-methane (micrograms per cubic meter)	Maximum Average in any 8 hours	-	10	5
	Maximum Average in any 1 hour	-	40	10
5. Ozone (micrograms per cubic meter)	Maximum Average in any 3 hours	-	140	100
	Maximum Average in any 1 hour	-	240	-
6. Nitrogen Dioxide (micrograms per cubic meter)	Annual Arithmetic Mean	-	100	70
	Maximum Average in any 24 hours	-	-	130
7. Airborne Lead (micrograms per cubic meter)	Average Over Calendar Quarter	-	1.5	-

Sources: 10 Code of Federal Regulations, Part 50 and State of Hawaii Public Health Rules and Regulations, Chapter 47.

See Figure 1 for location of Receptor Sites

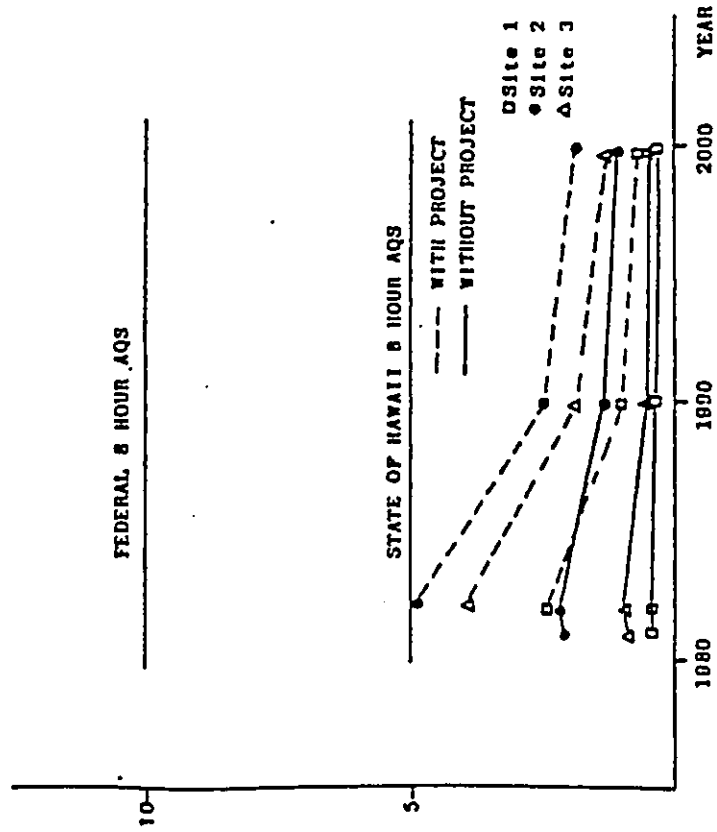


FIGURE 5. ESTIMATED EIGHT HOUR CARBON MONOXIDE AT SELECTED RECEPTOR SITES IN PROJECT AREA

TABLE 2

SUMMARY OF LONG-TERM PARTICULATE MEASUREMENTS AT WAIMANALO

(Micrograms Per Cubic Meter)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981*</u>
No. of Samples (24-hour)	86	71	51	60	59	57	15
Range	13-65	12-69	14-59	15-61	12-61	10-90	20-72
Acceage	29	25	31	29	10	29	33
No. of Times State AQS Exceeded	0	0	0	0	0	0	0

\* Data through March, 1981.

SOURCE: State of Hawaii Department of Health

APPENDIX F

BOTANICAL SURVEY

Botanical Survey of the Site for a Proposed Kahaluu Industrial  
Project

Prepared for Gray, Hong & Associates, Inc. Consulting Engineers  
116 South King St., Rm. 508  
Honolulu, Hawaii 96813

By Evangeline J. Funk, Botanist

A botanical survey of the vegetation of that portion of the Ahupuaa of Waihee in the district of Koolaupoko on the island of Oahu, State of Hawaii shown as parcels 1, 10, 11, 16, and 24 of Tax Key zone 4, section 7 plat 13 of the State of Hawaii Tax map system, containing approximately 22.3 acres, was carried out during September 4, 5 and 12, 1981 at the request of David Bills of Gray, Hong and Associates Inc. The field study included a survey of host plants of the endangered snails of the genus Achatinella (Hadfield 1981, Mountain 1981)

A species list was prepared and includes the scientific name and where possible the common names of all taxa. The following notations are included where appropriate:

"P"= Plants of known polynesian introduction

"E"= Exotic plants

"N"= Noxious weeds

"H"= Endemics - Plants known only to Hawaii

The list is arranged phylogenetically according to St. John (1973). The genera are arranged alphabetically within the families.

Most of the land in question is under water much of the time. At high tide the easterly portion (Makai) of this site is almost entirely submerged. Therefore, the flora was studied by making many short forays from Kamehameha Highway to the bay. Entry was obtained by walking over the Hibiscus tiliaceus (Hau) and along Rhizophora roots (Mangrove).

More than 75% of the westerly portion of this site is covered by surface water one to two feet deep. The area is accessible and was surveyed by walking the boundaries and several transects both east and west then north and south.

The flora of the site, except for a single plant of Psilotum nudum (Moa) is made up entirely of introduced plants. Along the shore is a dense stand of Rhizophora mangle L., American Mangrove. These trees are 8 to 10 m. in height and form a 100% canopy in

the area. Inland from the Rhizophora where the substrate is less saturated the canopy is made up of Hibiscus tiliaceus (Hau) and Leucaena leucocephala (Haole Koa) and mixed cultivars left over from a time when there were human dwellings in the area. The density of the canopy is intensified by the rampant growth of the weedy vine Paederia foetida (Maile Pilau).

The cover on the westerly or Mauka portion of this property is about equal parts Brachiaria mutica (Forsk.) Staph., California Grass, and Ludwigia octovalvis (Jacq.) Raven, one to two m. high. This noxious weed cover gives way to dense patches of the reeds Typa angustata Borg & Caubord and the Great Bulrush Scirpus californicus (C.A. Meyer) in the vicinity of Koalaea stream and along Kamehameha Highway.

No native Hawaiian plants, except the one mentioned earlier, were found on the site. There are no rare or threatened plants and no host plants for Achatinella. This parcel of land has been subjected to human activity (grazing) for a considerable period of time. The biota which is entirely introduced and mostly weedy will not be adversely affected by the proposed project.

Species List

<u>Family</u>	<u>Common Name</u>	<u>Designation</u>
<u>Psilotaceae</u>	Moa	Native
<u>Psilotum nudum</u> (L.) Griseb.		
<u>Salvineaceae</u>	Water fern	"p"
<u>Azolla filiculoides</u> Lam.		
<u>Cycadaceae</u>	Cycus Palm	"E"
<u>Cycas cirenalis</u> L.		
<u>Typhaceae</u>	Cat Tail	"E"
<u>Typha angustata</u> Berg & Chaubard		
<u>Alismataceae</u>	Arrowhead	"p"
<u>Sagittaria sagittaeifolia</u> L.		
<u>Gramineae</u>	Barnyard Grass	"N"
<u>Echinochloa crusgalli</u> (L.) Beauv.		
<u>Brachiaria mutica</u> (Forsk.) Stapf.	California Grass	"N"
<u>Chloris barbata</u> Swartz	Finger Grass	"N"
<u>Chloris divaricata</u> R. Br.	Star Grass	"N"
<u>Coix lacryma-jobi</u> L.	Jobs Tears	"N"
<u>Cynodon dactylon</u> (L.) Pers.	Bermuda Grass	"N"
<u>Digitaria pruriens</u> (Trin.) Buse	Slender Crab Grass	"N"
<u>Elysiine indica</u> (L.) Gaertn.	Wire Grass	"N"



Species List

<u>Family</u>	<u>Common Name</u>	<u>Designation</u>
<u>Eragrostis pectinacea</u> (Michx.) Nees	Love Grass	"N"
<u>Paspalum conjugatum</u> Berg.	Hilo Grass	"N"
<u>Paspalum orbiculare</u> Forst.	Rice Grass	"N"
<u>Paspalum vaginatum</u> Swartz.	Seashore Grass	"N"
<u>Setaria glauca</u> (L.) Beauv.	Yellow Foxtail Grass	"N"
<u>Sporobolus africanus</u> (Poir) Robyns & Tourney	Rattail Grass	"N"
<u>Cyperaceae</u>		
<u>Cyperus hypochlorus</u> Hilleb.	Cyperus	"N"
<u>Cyperus kyllingia</u> Endl.	White Kyllingia	"N"
<u>Fimbristylis diphylla</u> (Retz.) Vahl	Fimbristylis	"N"
<u>Seirpus californicus</u> (C.A. Meyer)	Great American Bulrush	"E"
<u>Palmae</u>		
<u>Cocos nucifera</u> L.	Coconut	"p"
<u>Araceae</u>		
<u>Colcasia esculenta</u> (L.) Schott	Taro	"p"
<u>Commelinaceae</u>		
<u>Commelina diffusa</u> Burm. f.	Hono Hono Grass	"N"

Species List

<u>Family</u>	<u>Common Name</u>	<u>Designation</u>
<u>Pontederiaceae</u>	Water Hyacinth	"E"
<u>Eichornia crassipes (Mart.) Solms</u>		
<u>Lilaceae</u>	Ti	"P"
<u>Cordyline terminalis (L.) Kunth</u>		
<u>Amaryllidaceae</u>	Queen Emma's Lily	"E"
<u>Crinum augustum Roxb.</u>		
<u>Museaceae</u>	Banana	"P"
<u>Musa paradisiaca</u>		
<u>Zingiberaceae</u>	Yellow Ginger	"E"
<u>Hedychum flavescens Carey in Roscoe</u>		
<u>Peperaceae</u>		
<u>Peperomia rotundifolia L.</u>		"E"
<u>Polygonaceae</u>		
<u>Rumex acetosella L.</u>	Sheep Sorrel	"E"
<u>Amaranthaceae</u>		
<u>Amaranthus spinosus L.</u>	Spiny Amaranth	"N"
<u>Portulacaceae</u>		
<u>Portulaca oleracea L.</u>	Pigweed	"N"

Species List

<u>Family</u>	<u>Common Name</u>	<u>Designation</u>
<u>Leguminosae</u>		
<u>Desmanthus virgatus (L.) Willd</u>	Beggar Weed	"E"
<u>Desmodium tortuosum (S.W.) D.C.</u>	Indigo	"N"
<u>Indigofera suffruticosa Mill.</u>	Haole Koa	"N"
<u>Leucaena leucocephala</u>	Sensitive Plant	"N"
<u>Mimosa pudica L.</u>	Clover	"E"
<u>Medicago sp.</u>		
<u>Rutaceae</u>		
<u>Murraya paniculata (L.) Jack</u>	Mock Orange	"E"
<u>Euphorbiaceae</u>		
<u>Euphorbia hirta L.</u>	Garden Spurge	"N"
<u>Euphorbia prostrata Ait.</u>	Prostrata Spurge	"N"
<u>Euphorbia glomerifera (Mill sp.) LC Wheeler</u>	Spurge	"N"
<u>Anacardiaceae</u>		
<u>Mangifera indica L.</u>	Mango	"E"
<u>Malvaceae</u>		
<u>Hibiscus tiliaceus L.</u>	Hau	"N"

Species List

<u>Family</u>	<u>Common Name</u>	<u>Designation</u>
<u>Malvastrum coromandelianum</u> (L.) Garcke	False Mallow	"N"
<u>Maivanicus arboreus</u> var. <u>arboreus</u>	Turk's Cap	"E"
<u>Lythraceae</u>	Tar Weed	"N"
<u>Cuphea carthagenensis</u> (Jacq.) McBride	American Mangrove	"N"
<u>Rhizophoraceae</u>		
<u>Rhizophora mangle</u> L.		
<u>Combretaceae</u>	False Kamani	"E"
<u>Terminalia catappa</u> L.		
<u>Myrtaceae</u>	Jana Plum	"E"
<u>Eugenia cumini</u> (L.) Duce	Guava	"E"
<u>Psidium guajava</u> L.		
<u>Onagraceae</u>	Primrose Willow	"N"
<u>Ludwigia octovalvis</u> (Jacq.) Raven		
<u>Araliaceae</u>	Octopus Tree	"E"
<u>Brassaia actinophylla</u> Endl.		
<u>Umbelliferae</u>	Asiatic Pennywort	"N"
<u>Centella asiatica</u> (L.) Urban		

Species List

<u>Family</u>	<u>Common Name</u>	<u>Designation</u>
<u>Convovulaceae</u>		
<u>Ipomoea congesta</u> R. Br.	Blue Morning Glory	"N"
<u>Ipomea obscura</u> (L.) Ker.	Morning Glory	"N"
<u>Bignoneaceae</u>		
<u>Spathodea campanulata</u> Beauv.	African Tulip	"E"
<u>Plantaginaceae</u>		
<u>Plantago lanceolata</u> L.	Narrow Leaved Plantain	"N"
<u>Plantago major</u> L.	Broad Leaved Plantain	"N"
<u>Rubeaceae</u>		
<u>Paederia foetida</u> L.	Maile Piñau	"N"
<u>Compositae</u>		
<u>Conyza canadensis</u> (L.) Crong.	Canada Fleabane	"N"
<u>Eclipta alba</u> (L.) Hassk.	False Daisy	"N"
<u>Pluchia indica</u> (L.) Less.	Indian Fleabane	"N"
<u>Siegesbeckia orientalis</u>	Small Yellow Crown Beard	"N"
<u>Veronia cunerea</u> (L.) Less.	Little Iron Weed	"N"
<u>Widelia triloba</u>		"E"

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APPENDIX G

FAUNA REPORT

Fauna Report for  
The Proposed Kahaluu Industrial Complex  
By Andrew J. Berger

This report was prepared on instructions received from David Bills of Gray, Hong & Associates, Inc., in a letter dated August 17, 1981, which also included maps and an Environmental Impact Statement Preparation Notice.

The study area mauka of Kamehameha Highway consists of a low lying area overgrown with several introduced grasses, bulrushes, shrubs, and vines, with a few scattered clumps of taro. Numerous introduced trees and herbaceous plants grow around the houses found mauka and south of the proposed construction area: for example, banana, mango, hibiscus, plumeria.

The study area makai of Kamehameha Highway is very different but also a depauperate habitat for most vertebrate animals. The area is covered by a dense hau (Hibiscus tiliaceus) jungle from the highway virtually to the shoreline, where mangrove (Rhizophora mangle and/or Bruguiera conjugata) replaces the hau. I saw only one bird species in this dense habitat during my field work. There is no beach and, at high tide, there is no suitable habitat for migrant shorebirds.

#### Historical Overview

The history of the Kahaluu-Waikane area of the windward coast of Oahu has been described by Handy and Handy (1972), Kuykendall (1974), McCandless (1936), Parker (1852), and others. According to these sources a large Hawaiian population occupied these valleys during the last century, growing taro, bananas, and other crops. Later, both rice and sugarcane were grown,



and pineapple was grown in Kahaluu Valley from about 1909 to 1926. As a result, virtually all of the native vegetation was destroyed in these windward valleys more than a century ago. Moreover, both domesticated and feral goats, pigs, and cattle also were abundant on Oahu during the last century and well into the present century. These grazing and rooting mammals contributed to the destruction of the native vegetation, especially in the upper reaches of the valleys and on ridges and slopes that were too steep for cultivation (Tomich, 1969). Severe erosion scars are visible today, and are especially conspicuous as one approaches the valleys by boat on Kaneohe Bay.

Because of the serious destruction of the native vegetation in the mountains on Oahu by cattle, goats, and pigs, the Hawaiian Government first appropriated money for tree planting in 1882. The first forest reserve was established in 1903. L. W. Bryan reported that 1,057 different species of exotic plants were tested in arboreta during the period of 1921-1946. The Waiahole Forest Reserve was established in 1918.

In addition to the many species of exotic plants introduced to the Hawaiian Islands by foresters, the residents imported many species of fruit trees (e.g. papaya, mango, lychee, citrus) and flowering plants to the islands. Don Francisco de Paula Marine introduced avocados and many other fruits and flowering trees to Oahu during the early 1800s. St. John (1973) lists 4,643 different species of exotic trees and shrubs that have been introduced to the Hawaiian Islands. As a result, very few native plants can be found in lowland areas where man and introduced mammals have had an influence.

The following list is a small sample of the many introduced plants found in the valley (mostly mauka of the proposed construction site: hau (Hibiscus tiliaceus), mangrove (Rhizophora mangle), tree heliotrope (Messerschmidia argentea), coconut palm (Cocos nucifera), false kamani (Terminalia meliacatappa), mango (Mangifera indica), koa haole (Leucaena glauca), casuarina (Casuarina sp.), coral hibiscus (Hibiscus schizopetalus), Christmas berry (Schinus terebinthifolius), guava (Psidium guajava), ti (Cordyline terminalis), Pandanus (Pandanus odoratissimus), Koster's curse (Clidemia hirta), Jamaica vervain (Stachytarpheta jamaicensis), uala (Ipomoea batatas), cassia (Cassia leschenaultiana), rattlebox (Crotalaria incana), Flora's paint brush (Emilia sonchifolia), and several species of passion flower (Passiflora spp.).

#### Fauna

There is no suitable habitat on the proposed construction sites for native snails or fishes.

#### A. Amphibians, Reptiles, and Mammals.

There are no native amphibians, land reptiles, or land mammals in Hawaii. All in the Kahaluu district, therefore have been introduced by man, and some are pests.

#### Amphibians

1. Giant Neotropical Toad (Bufo marinus). This toad was first introduced to the Hawaiian Islands in 1932, "when Dr. C. E. Pemberton brought 148 adult toads from Puerto Rico. Eighty of these were liberated in a taro patch near Waipio, Oahu, and 68 were released in a swampy part of Manoa Valley" (Oliver and

Shaw, 1953:77). The toads were successful, and "in a little over two years more than 100,000 descendents of the original stock were distributed through Dr. Pemberton's activities throughout the islands." Hunsaker and Breese (1967) wrote that Bufo marinus was "the commonest species of amphibian" in Hawaii. This toad is found throughout lowland areas on the windward coast and, in the past, I have seen them as high as 280 feet elevation in the nearby Waiahole forest reserve.

2. Gold and Black Poison Frog (Dendrobates adriatus). This frog, too, was introduced on Oahu to "assist in the control of insect pests." Oliver and Shaw state that the species was released in upper Manoa Valley in 1932. Hunsaker and Breese (1967) wrote that "additional plantings with subsequent establishment have been made in Waiahole Valley, and the population has been observed to fluctuate in size at this locality, again according to the amount of water available." Although said to be diurnal in habits, they are "most active in the morning after a rain." Although possible, it is doubtful that these small frogs have spread from their Waiahole release site to the lower elevations in the Kahaluu district.
3. American Bullfrog (Rana catesbeiana). "This was probably one of the first species of amphibians to be introduced into the Hawaiian Islands and may have been one of the frogs that was imported prior to 1867" (Oliver and Shaw, 1953). The frogs were abundant enough to be harvested commercially by 1900. Tinker (1941) wrote that "the University of Hawaii has organized 'frog clubs' to encourage

the production of frogs for food." The species is not nearly so abundant now, presumably because of the drainage of so many wetland areas and, perhaps also, because of the widespread use of pesticides during recent decades. I did not see or hear this frog in the project area.

#### Reptiles

1. Blind Snake (Typhlops braminus). "This small, secretive snake was apparently introduced from the Philippines in the dirt surrounding plants that were brought in for landscaping the campus of the Kamehameha Boys School in Honolulu. It was first found there in January of 1930" (Oliver and Shaw, 1953). By 1967, however, Hunsaker and Breese wrote that "it now appears to occupy the lowland area over the entire island." These blind, worm-like snakes are rarely seen until they are flooded from their underground burrows by heavy rain or unless one looks for them under branches and other debris on the ground. I did not search for these animals because they were of no special significance for this study.
2. Mourning Gecko (Lepidodactylus lugubris). This abundant gecko presumably was brought to Hawaii by the early Polynesians. The species is found in all habitats from mountain forests to urban Honolulu.
3. Fox Gecko (Hemidactylus garnoti). This is primarily a nocturnal species and I did not see it during my field trips in the valley. Oliver and Shaw (1953) wrote that "this species is found in more or less forested areas throughout the islands and seems to be equally abundant in the drier coastal regions and higher elevations

of more abundant rainfall. It is normally most active at night when it may be found foraging for food on the trunks of trees, on the sides of buildings and on fences or walls."

Mammals

1. The only native land mammal is the Hawaiian Bat (Lasiurus cinereus semotus). Kramer (1971) wrote that "to date, it appears that the Hawaiian bat occurs primarily on the island of Hawaii, and appears only irregularly on the islands of Maui, Oahu, and Kauai." For Maui, Oahu, and Kauai, "the bats seem to appear only during the months from August to December." I did not see any bats in the project area.
2. Roof Rat or Black Rat (Rattus rattus). The Roof Rat reached the Hawaiian Islands from sailing ships, presumably during the 18th century; three different color types occur in Hawaii. The Roof Rat is very common and is found from sea level well up into the mountains (as high as 9,800 feet on Haleakala). They are primarily nocturnal in habits, and I did not see any during my daytime studies. Roof Rats are presumed to be serious predators on the eggs and young of tree-nesting birds in Hawaii.
3. Polynesian or Hawaiian Rat (Rattus exulans). The early Polynesian settlers on Hawaii are presumed to have brought (inadvertently) this rat with them. No study of the distribution of this rat has been conducted on Oahu, but they are known to occur from sea level (and on Popoia Islet off the shore from Lanikai) into the mountains (Kramer, 1971; Tomich, 1969). It occurs in both native and introduced forests, grassy gulches, and shrub-grown areas.

This species, too, is said to be primarily nocturnal in habits, and I did not encounter it in my study, although it certainly occurs in the valley.

4. House Mouse (Mus musculus). The date of introduction of the House Mouse to Hawaii is unknown, but it is said to have been common by 1825. It "can be found inhabiting almost every biotic community that occurs from sea level up to at least 6,500 feet" (Kramer, 1971). It is ubiquitous around human habitation, and, in Hawaii, also is found in sugarcane fields, in fallow fields, and in forests and scrubland in fairly wet areas. I did not attempt to determine the abundance and distribution by trapping because of the general distribution of House Mouse and because its occurrence is not significant with regard to an environmental impact statement.
5. Small Indian Mongoose (Herpestes auropunctatus). The mongoose was first imported to the Hamakua Coast of Hawaii during September 1883, to combat rats in the sugarcane fields. They were imported to Oahu and other islands about 1888. The mongoose is an abundant pest on all of the islands today, and is found from sea level to the highest mountain peaks on Oahu. Being diurnal in habit, they are often seen crossing roads. I saw an adult female with a small young mongoose near the Hawaiian Telephone buildings on Waihee road.

B. Birds

1. There is no suitable habitat for any endemic or native bird in the proposed construction site.
2. Although some migratory Pacific Golden Plovers (Pluvialis dominica fulva) have returned to Hawaii for the winter season, there still are not large numbers here, and I did not see any during my field survey. This is one of the most common winter residents in Hawaii, being found from sea level to approximately 10,000 feet elevation on Maui and Hawaii. It inhabits pastures, golf courses, city lawns, cutover sugarcane fields, and other disturbed or weedy areas so long as the vegetation is low. The Golden Plover occurs along the beach and mudflats at low tides as well as in open, weedy areas at higher elevations. Because of the mangrove thickets along the shoreline, there is little, if any, suitable habitat for the plover or for any of the other wintering shorebirds even at low tide.

3. Introduced Birds

More than 170 different species of exotic birds have been introduced to the Hawaiian Islands since about 1796 (Berger, 1981). I saw only three species on the proposed construction sites but a number of others inhabit the yards and fields adjacent (mostly upslope) to the proposed construction site. Brief descriptions of these follow:

Family Ardeidae, Herons and Egrets

1. Cattle Egret (Bulbucus ibis). This species was imported to Hawaii from Florida to aid "in the battle to control house flies, horn flies, and other flies that damage hides and cause lower weight gains in cattle" (Breese, 1959). A number of Cattle Egrets were

released on Oahu in 1959, and 22 additional birds were released during July 1961. Thistle (1962) reported that the population of Cattle Egrets on Oahu exceeded 150 birds by July 1962; the population has increased greatly since that time. There is now a large rookery at the Kaneohe Marine Corps Air Station, and the birds spread out from this roost to feed during the daytime. It is not uncommon to see small flocks of these birds feeding in pasture and cutover land along Kamehameha Highway. I watched several fly low over the valley just upslope from the proposed construction site.

Family Columbidae, Pigeons and Doves

2. Spotted or Chinese Dove (Streptopelia chinensis). This Asian dove was introduced to the Hawaiian Islands many years ago; the exact date is unknown, but the birds were reported to be common by 1879. This species occurs where rainfall exceeds 100 inches per year, but the highest densities are found in drier areas where the introduced kiawe is one of the dominant plants. Schwartz and Schwartz (1949) found densities as great as 200 birds per square mile in dry areas on Molokai. This dove is found throughout the valley except in densely wooded areas at the higher elevations of the Koolau Range.

3. Barred Dove (Geopelia striata). This species also is called the Zebra Dove in its native habitat in the Orient and Australia. This species is said to have been introduced to Hawaii sometime after 1922 (Bryan, 1958). It is now one of the most common land birds in the Hawaiian Islands. Schwartz and Schwartz (1949)



reported densities as great as 400 to 800 birds per square mile in some areas on Oahu and Molokai in 1947. It was one of the three bird species that I actually saw on the proposed construction site.

Family Tytonidae, Barn Owls

4. The first Barn Owls (Tyto alba) were imported from California and released in Hawaii during 1958. Barn Owls were released at Hauula, Oahu, on two different occasions: seven birds were imported from the San Diego Zoo and released during September 1959; 11 birds were imported from the San Antonio Zoo and released during October 1960 (Tomich, 1962). As with the mongoose during the last century, the Barn Owls were introduced in the hope that they would prey upon the rats that are pests in sugarcane fields. All reports indicate that they have not been an important factor in controlling rats because their primary diet consists of house mice. No study of the spread of the Barn Owl from the Hauula region since 1960 has been conducted, but the birds have been seen or heard--and often found injured or dead--in both the windward and leeward parts of Oahu. The birds are nocturnal in habit and hence are not often seen. It is reasonable to assume that one or more pairs occupy the valley area.

Family Pycnonotidae, Bulbuls

5. Red-vented Bulbul (Pycnonotus cafer). Although all species of bulbuls were included in the list of "prohibited entry" birds to the Hawaiian Islands (because they are largely fruit eaters), two species are now well established on Oahu. The Red-vented Bulbul

was first reported on Oahu at Waipahu in 1966, and one bird was seen near Fort Shafter that same year. The Red-vented Bulbul is now common on windward Oahu and the birds occur around the houses on Waihee road less than 100 yards from the Hawaiian Telephone Company buildings.

Family Sturnidae, Starlings and Mynas

6. Common Indian Myna (Acridotheres t. tristis). The Common Myna, which is native to Ceylon, India, and Nepal, was introduced from India in 1865 to combat a plague of army worms that were infesting pasture lands. The Myna is common to abundant in all lowland areas in the Hawaiian Islands. It typically occurs around human habitation, both in urban and rural areas.

Family Zosteropidae, White-eyes and Silver-eyes

7. Japanese White-eye (Zosterops j. japonica). Caum (1933) wrote that the White-eye was first imported from Japan to Oahu by the Territorial Board of Agriculture and Forestry in 1929. Later importations were made by the Hui Manu and private individuals. The White-eye is now thought to be the most abundant land bird in the Hawaiian Islands (Berger, 1981). It occurs from sea level to tree line on Maui and Hawaii. There is no habitat on Oahu where this bird cannot be found, and it was the only species that I found in the hau thickets makai of the highway.

Family Ploceidae, Weaverbirds and Their Allies

8. House Finch (Carpodacus mexicanus frontalis). Also known as the Papayabird in Hawaii, the House Finch was introduced from California "prior to 1870" (Caum, 1933). The House Finch is now

an abundant species in both urban and rural areas. It may well be the second most common land bird in the islands. It occurs throughout the valley.

9. Ricebird or Spotted Munia (Lonchura punctulata). This Asian species was introduced to Hawaii by Dr. William Hillebrand about 1865 (Caum, 1933). The Ricebird is a very common species, and the birds occur wherever there are grass and weed seeds in open areas.

10. House Sparrow (Passer domesticus). The House Sparrow was first imported to Oahu in 1871, when nine birds were brought in from New Zealand (where the species had previously been introduced from England). House Sparrows are common around houses in the valley as well as the buildings of the Board of Water Supply and Hawaiian Telephone Company.

Family Fringillidae, Sparrows and Cardinals

11. Cardinal (Cardinalis cardinalis). The Cardinal was released several times between 1929 and 1931 (Caum, 1933). The species is fairly common in many lowland areas, and is a characteristic bird of the leeward parts of Oahu, finding the dry introduced vegetation (such as kiawe and koa haole) as suitable habitat as well as the wetter windward areas. It has a very wide distribution in the valley, being found from near sea level to the highest ridges of the area. It occurs in shrub-grown areas and around the houses just mauka of the construction site.

12. Red-crested Cardinal (Paroaria coronata). This species typically has been called the Brazilian Cardinal in Hawaii, but the native range includes a much greater part of South America. This species was released in Hawaii on several occasions between 1928 and 1931 (Caum, 1933). It occurs in open areas and around the houses in the lower parts of the valley.

Summary Statement

There is absolutely no way in which the proposed development can have a detrimental effect on any endemic plant or animal or on any endemic or native ecosystem. There are no endangered endemic plants in the area and there has not been any semblance of a native ecosystem in the lower reaches of the Kahaluu valley area for at least 100 years and probably much longer than that. A number of the introduced plant species are pest plants.

There are no native amphibians, reptiles, or mammals in the area. All have been introduced by man, and most of them are pests: for example, roof rat or black rat (Rattus rattus), Polynesian rat (Rattus exulans), house mouse (Mus musculus), and small Indian mongoose (Herpestes auropunctatus). These mammals prey on both ground-nesting and tree-nesting birds, and the rats and mouse cause great damage to agriculture as well as in homes and industrial plants.

There are no endemic birds in the area proposed for development nor in the valley above it. There is little, or no, habitat for the wintering shorebirds. All of the other bird species found at or above the construction site are exotic birds, introduced to the Hawaiian Islands by man. Some of these species (e.g., Ricebird, House Finch) have been serious pests on agricultural crops in Hawaii. Finally, neither habitat (mauka or makai of Kamehameha Highway) provide permanent habitat even for the introduced bird species.

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APPENDIX H

TRAFFIC STUDY

(This appendix has been included in whole as contained in the Kahaluu Commercial and Residential Development EIS as prepared by Henry Tuck Au. Portions of this study have been referenced in the text of this EIS.)



ILLUSTRATIONS

<u>Plate No.</u>	<u>Title</u>
1	Vicinity Map
2	Project Location Map
3	Existing And Future Highway Systems
<u>TABLES</u>	
1	Average Daily Traffic & Peak Hour Volumes Station J1-K, Kahakuli Highway At Kamehameha Highway & Aheolalo Road
2	Weekend Traffic Volumes, June 5, 6 & 7, 1981, Kamehameha Highway At Waihee Road
3	Traffic Volume & Turning Movement Counts, Friday, June 5, 1981, Kamehameha Highway At Waihee Road
4	Traffic Volume & Turning Movement Counts, Saturday, June 6, 1981, Kamehameha Highway At Waihee Road
5	Traffic Volume & Turning Movement Counts, Sunday, June 7, 1981, Kamehameha Highway At Waihee Road
6	Weekend Traffic Volumes, June 5, 6 & 7, 1981, Waihee Road At Kamehameha Highway
7	Traffic Volume & Turning Movement Counts, Friday, June 5, 1981, Waihee Road At Kamehameha Highway
8	Traffic Volume & Turning Movement Counts, Saturday, June 6, 1981, Waihee Road At Kamehameha Highway
9	Traffic Volume & Turning Movement Counts, Sunday, June 7, 1981, Waihee Road At Kamehameha Highway
10	Average Daily Traffic, Saturday & Sunday Traffic Volumes, Kamehameha Highway At Waihee Road
11	Average Daily Traffic, Saturday & Sunday Traffic Volumes, Kamehameha Highway At Waihee Road

TABLES

12	Trip Characteristics--All Modes, Residential Land Use
13	Household Characteristics
14	Trip Generation, Residential Land Use
15	Hourly Distribution Of Shopping Trips--Daytime Shopping
16	Hourly Distribution Of Shopping Trips--Evening Shopping

SUMMARY

1. The proposed Kahalaou Commercial & Residential Project is located in Kahalaou, Oahu on approximately 15.3 acres of land at the intersection of Wahee Road and Kamehameha Highway and is identified by Tax Map Key 4-7-12; 12 and 27.
2. The tentative proposal for the project is to construct a commercial retail complex of 4 single story buildings with street level parking on the B-2 Community Business District portion of the site and a 21-lot single family residential subdivision on the maka Residential District portion of the site.
3. Kahalaou Highway merges with Kamehameha Highway approximately 1,400 feet south of Wahee Road and consequently, is the only major arterial serving the project under the existing highway system.
4. Kamehameha Highway will remain as the only major arterial serving the project site under both the existing and future highway systems, except that Kamehameha Highway must be improved to higher standards and design for future traffic volumes. The future highway system will mitigate at a future time any possible undesirable traffic congestion.
5. In 1976, the traffic volume on Kamehameha Highway at Station 31-K was 12,700 vehicles. By 1979, the traffic volume increased to 15,123 vehicles. However, in 1981, the traffic volume showed a considerable reduction from the 1979 volume of 15,123 vehicles to 11,965 in 1981, a decrease of 3,158 vehicles or 20.88 per cent. The reduction in traffic volume may be attributed to the rising cost of transportation and to the decline in tourist travel.
6. For the weekend traffic on Kamehameha Highway at Wahee Road, the 12 hour volume from 6:00 a.m. to 6:00 p.m. is the highest on a Saturday and the lowest on a Friday, whereas on Wahee Road, the 12 hour volume is the highest on a Friday (a weekday) and the lowest on a Sunday.
7. The peak hour time intervals for the weekend traffic on Kamehameha Highway and Wahee Road occur on different hours of the day and there is not the conflict or overlap of peak hour volumes with those of either Wahee Road or Kamehameha Highway. The significant differences in peak hour characteristics result in an equalization and spacing of the traffic load on Kamehameha Highway and thus, will not substantially affect the capacity of Kamehameha Highway.
8. Wahee Road is a secondary street with a right of way width of 60 feet and pavement width of 40 feet. For a secondary street with a right of way width of 60 feet with no parking and at grade intersection, the capacity is approximately 850 vehicles per hour in one direction and 1,275 for both directions of travel at Level of Service C.
9. The highest peak hour volume on Wahee Road, the Friday peak hour volume from 7:00 a.m. to 8:00 a.m. is only 352 vehicles for both directions of travel, with 183 vehicles leaving and 169 vehicles entering the roadway. Wahee Road is adequate to meet not only present vehicular demands, but also future increases as well.
10. The traffic volumes generated by the proposed project have already been included into the projected future traffic volumes on Kamehameha Highway and need not again be counted. The inclusion in on the base of the projections of future traffic volumes wherein it was assumed that there will be continuation of a high level of activity and growth in the Kahalaou District and that other projects in the Kahalaou District will take place which will maintain the high level of increase in traffic volumes on Kamehameha Highway. Furthermore, all factors were considered in the projections of future traffic volumes along Kamehameha Highway, including vacant and agricultural land in the area and growth in the resort industry.
11. Kamehameha Highway under present conditions will have sufficient capacity to accommodate present as well as future vehicular demands to the year 1990. Beyond 1990, the future highway system will require the improvement of Kamehameha Highway to a 4-lane divided highway. This improved 4-lane divided highway should have a capacity of travel from 2,892 to 4,958 vehicles per hour for both directions of travel and be able to accommodate an average daily traffic volume within the range of 35,758 to 45,000 vehicles. The future highway system not only will be adequate but will have considerable excess capacity and mitigate at a future time any possible undesirable traffic congestion.
12. The 21 dwelling units of the residential subdivision will generate a 24 hour volume of 168 trips and a peak hour volume of 14 trips. The peak hour volume of 14 trips is at the rate of 1 trip per 4.29 minutes and is so negligible that its impact on the highway system will be disregarded.
13. Using the highest values of regional shopping center characteristics at 600 trips per acre, the traffic generated by the proposed commercial-retail complex will result in 4,214 trips per day. The peak hour volume generated by the complex will occur either before or after the peak commuting hours of the highway system. Since highways must be designed to meet peak hour commuting demands, the roadway system will be able to accommodate the traffic generated by the proposed commercial-retail complex at an acceptable level of service.
14. No reliance was made on public mass transportation to reduce the traffic impact of the project. Mass transportation was considered only as a possible mitigating factor which may mitigate in the future, the adverse consequences of traffic and improve the traffic flow on the highway and street systems.

15. Approximately 284 parking spaces will be provided for the commercial-retail complex, compared to 265 parking spaces required by the Comprehensive Zoning Code. To facilitate traffic movement and to minimize traffic congestion, entrances and exits will be located at both Kamehameha Highway and Vailhet Road.

16. Analyzing the various factors, it may be concluded the proposed project will not add substantially to the traffic problems to create an adverse impact. Although Kamehameha Highway under present conditions will have sufficient capacity to accommodate present as well as future traffic demands to the year 1990, the future highway system with Kamehameha Highway improved to a 4-lane divided highway will provide considerable excess capacity and further mitigate at a future time any possible undesirable traffic congestion.

A-4

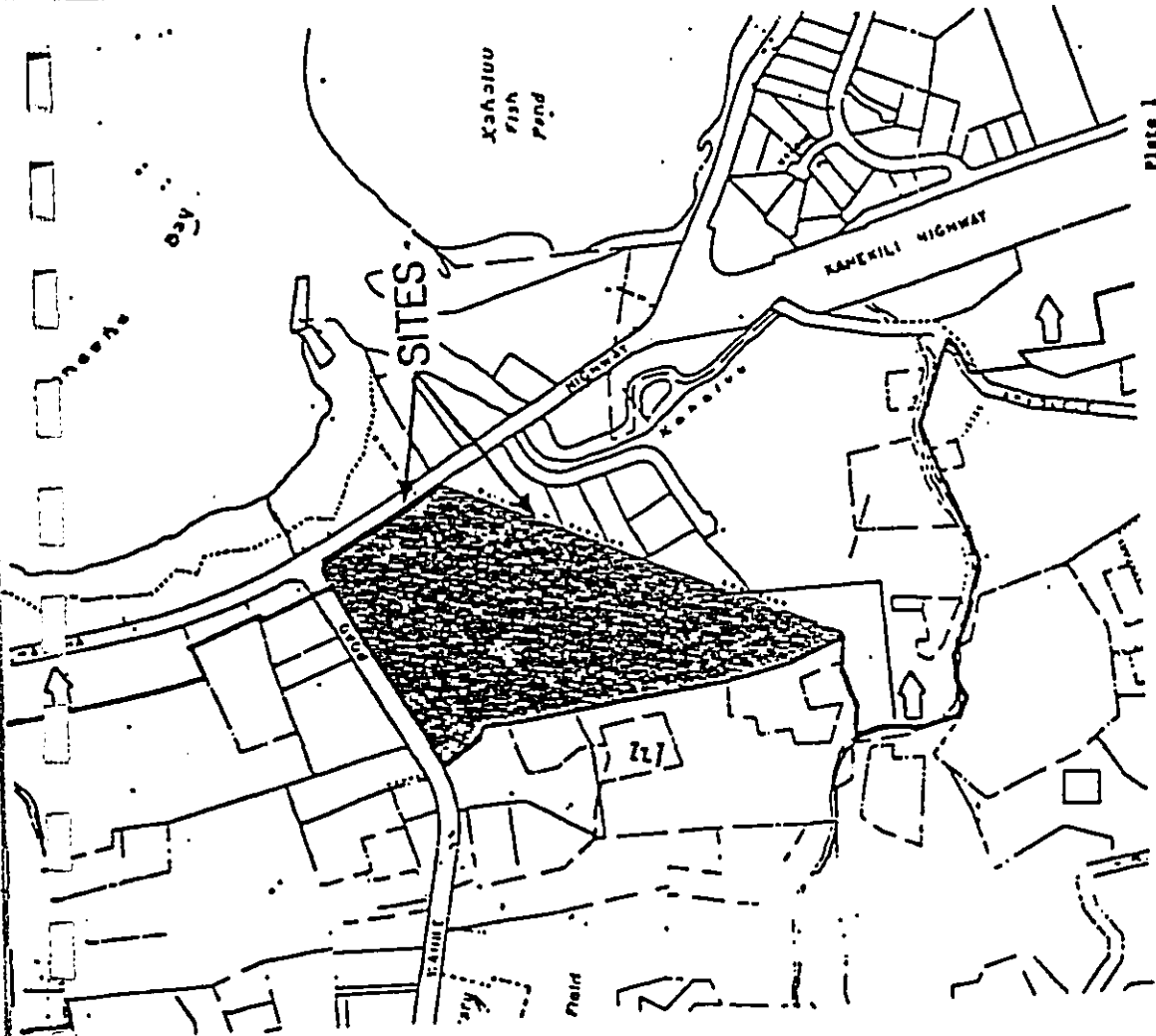


FIGURE 1  
VICINITY MAP

LEGEND  
SMA BOUNDARY LINE



SCALE 1" = 400'

TAX MAP KEYS: 4-7-12:12, 27.

T-4

T-3

**DESCRIPTION OF PROJECT**

The proposed Kahaluu Commercial & Residential Project is located in Kahaluu, Oahu on approximately 13.3 acres of land at the intersection of Wailehu Road and Kamehameha Highway and is identified by Tax Map Key 4-7-12; 12 and 27. Within the project site, there are three zoning designations: B-2 Community Business District (7.023 acres), R-3 Residential District (5,580 acres), and R-6 Residential District (2.675 acres). The project location map, Plate 1, outlines its relationship to the highway system and the neighborhood.

The tentative proposal for the project is to construct a commercial retail complex of 4 single story buildings with parking on the B-2 Community Business District portion of the site and a 21 lot single family residential subdivision on the mauka Residential District portion of the site.

The commercial-retail complex will provide a total building area of approximately 96,000 square feet, to include a food market, restaurants, general commercial and retail establishments. All four of the proposed buildings will be one-story in height and each will contain from approximately 5,000 square feet to 40,000 square feet of floor space. Three of the buildings will be located towards the mauka side of the B-2 Community Business District portion of the site and be grouped together to create a pedestrian arcade for shoppers. The fourth detached building will be constructed along the Kamehameha Highway and Wahee Road intersection and contain a fast food service establishment with drive through service.

To accommodate these uses, the complex will have street level parking for 284 automobiles. To facilitate traffic movement and to minimize traffic congestion, entrances and exits will be located at both Kamehameha Highway and Wailehu Road. A separate driveway for service vehicles and employee parking is proposed with access from Wailehu Road, away from the major highway, Kamehameha Highway.

Although the minimum lot size for a subdivision in an R-6 Residential District is only 5,000 square feet, all of the 21 single family residential lots will have a minimum lot area of 10,000 square feet and be sold in fee. As required by Park Dedication Rules and Regulations, one additional lot of approximately 13,200 square feet will be created and set aside for park and playground facilities for the subdivision. Wailehu Road will serve as access to the subdivision and will be improved to subdivision standards for dedication to the City and County of Honolulu.

To provide for the possibility of the future widening of Kamehameha Highway, a buffer strip using the residential zoned portion of the site adjacent to Kamehameha Highway will be landscaped and maintained between the proposed development and the highway. The depth of this buffer strip will be approximately 115 feet from the highway, considerably more than the 35 foot setback requested by the State Department of Transportation for highway widening.

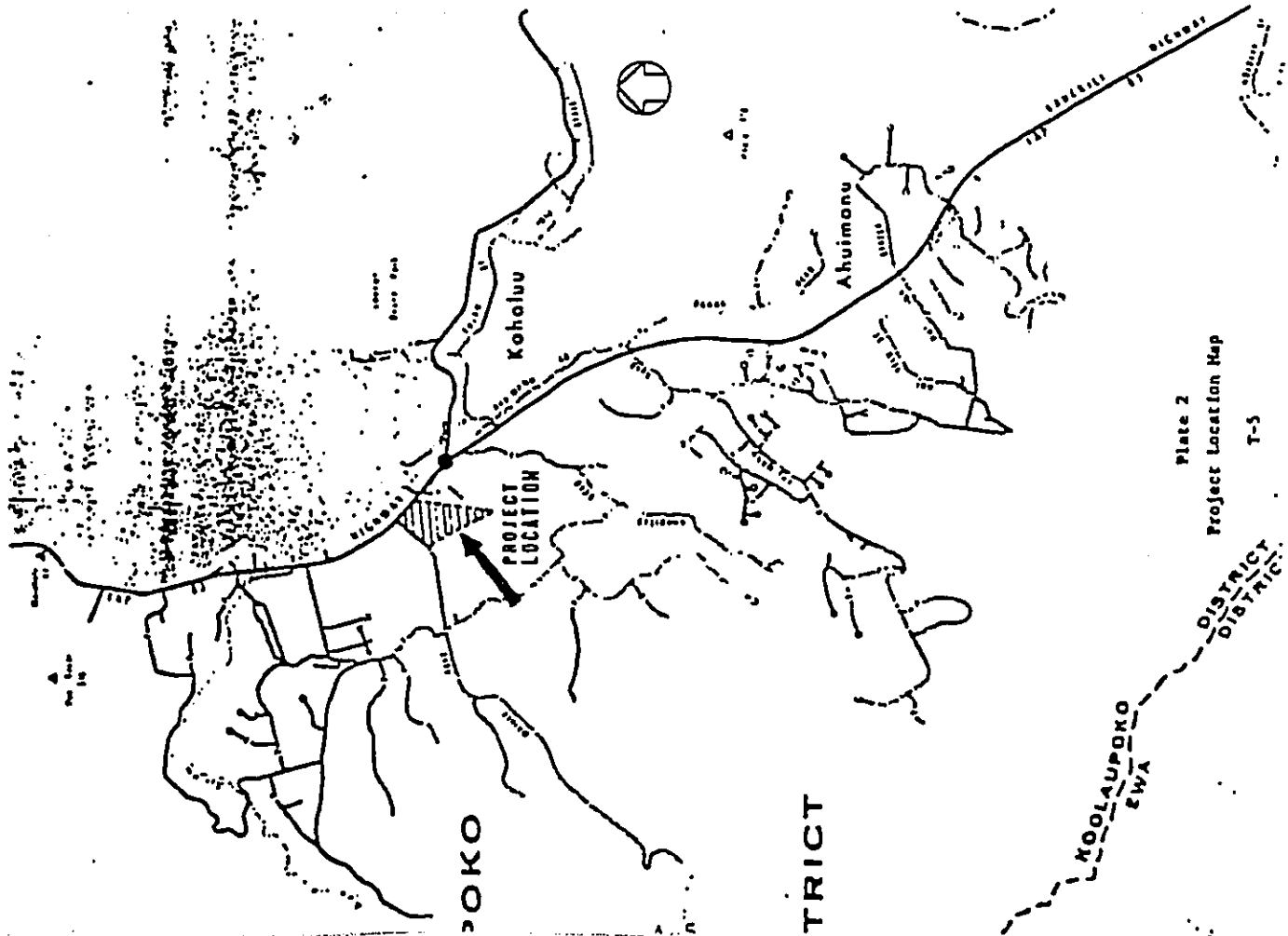


Plate 2  
Project Location Map

The project site is designated for highway right-of-way, commercial, low-density residential, and sewage treatment plant uses. However, the proposed "Development Plan for Koolauoko" delineates the project site for agricultural use. The entire site is also located within the Special Management Area (SMA).

#### INTRODUCTION

Any plan for community development must have sound social and economic objectives. Social, aesthetic and other values play a role in the pattern of development and the physical growth of a community must include improvements to the aesthetic, the general environment and to the social and economic welfare of the area affected by the project.

The impact of traffic on the environment can be severe and is one of the most controversial issues. However, appropriate land use and development patterns make it possible to minimize adverse environmental and traffic effects. With the aid of well-conceived plans, based on sound economic principles and with a high social purpose, a development can be made to enhance the aesthetic, environmental and economic aspects of the neighborhood and provide a service to the community with a minimum disruption of environmental activities.

This report is made to analyze and evaluate the traffic impact of the proposed development on the highway system, the neighborhood and the community.

A-6

#### EXISTING HIGHWAY SYSTEM

The existing highway system serving the project site is shown on Plate 3. The streets in light lines are local streets primarily for access to abutting properties and are intended for local traffic. The local streets have been included to relate its effect on the major highway system and its impact at the local level.

As shown on the plan, Kamehameha Highway merges with Kamehameha Highway approximately 1,400 feet south of Waiker Road. Consequently, Kamehameha Highway is the only major arterial serving the project. Kamehameha Highway is designated on the Federal-aid Primary System and will have an important role to accommodate large volumes of traffic.

T-7

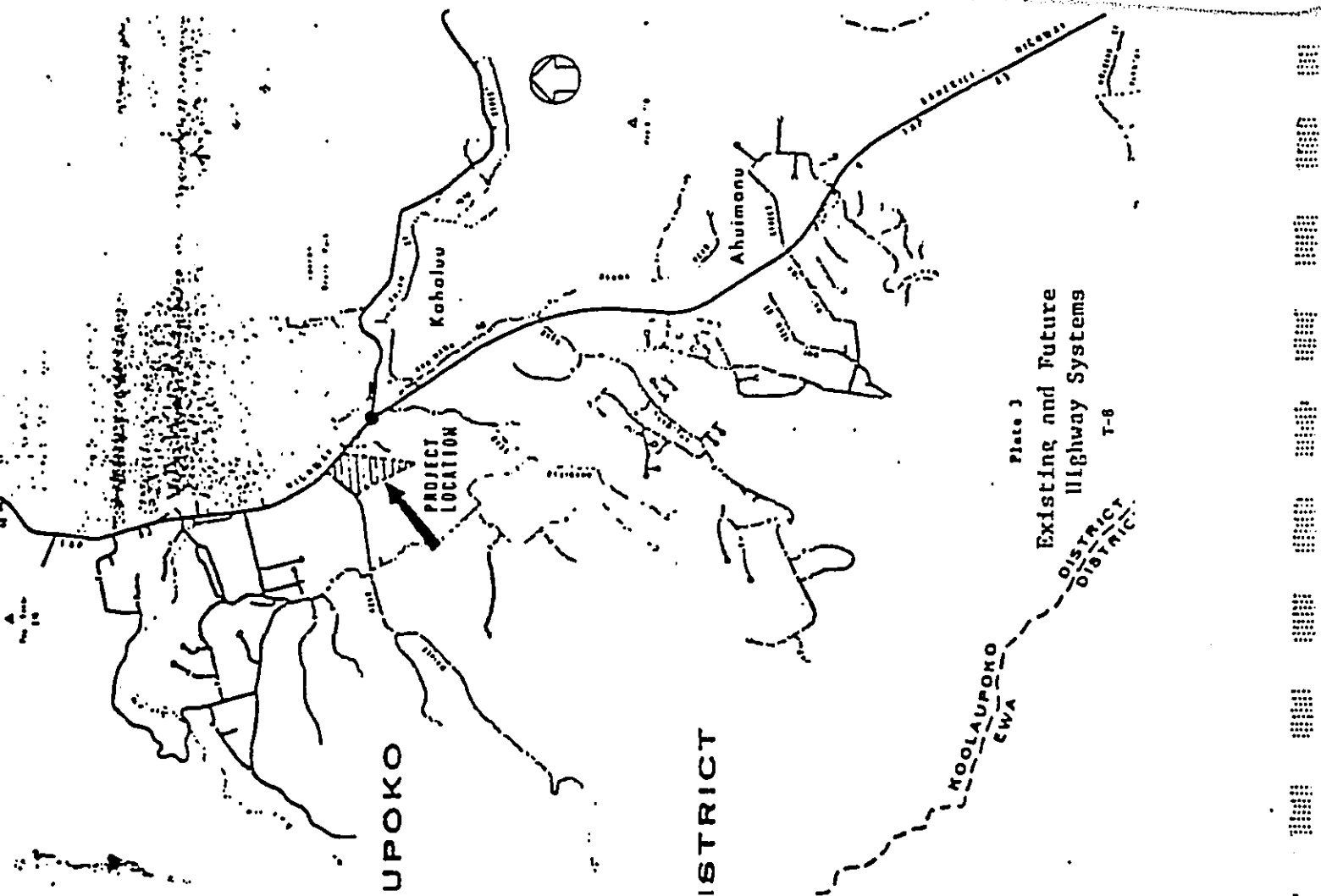


Plate 3  
Existing and Future  
Highway Systems  
T-8

FUTURE HIGHWAY SYSTEM

Under the existing General Plan of the City and County of Honolulu, the future highway system designates Kāhikū Highway and its extension at Kāhāmaha Highway as a major highway and proposes the improvement of many streets and the extension or construction of additional new facilities to serve the Kāhāmaha District. However, the proposed "Development Plan for Kōalaupoko" redesignates much of the Kāhāmaha District for agricultural use and the future highway system has not yet been developed.

Inasmuch as Kāhāmaha Highway is on the Federal-aid Primary System, Kāhāmaha Highway will remain as the only major arterial serving the project site under both the existing and future highway systems, except that Kāhāmaha Highway must be improved to higher standards and designs for future traffic volumes. The future highway system, therefore, will mitigate at a future time any possible undesirable traffic congestion.

TRAFFIC VOLUMES

Traffic volume information and data were obtained from the report "Traffic Summary, Island of Oahu, 1973" of the State Department of Transportation, from the latest traffic volume counts collected by the Department and from traffic volume counts collected by the Consultant at the intersection of Kāhāmaha Highway and Waihee Road.

The "Traffic Summary" is a digest of current and historical data relative to vehicular traffic and travel, and includes a tabulation of the average daily traffic counts at selected stations. Traffic volumes are collected annually, making it possible to compare and analyze the growth trends of traffic on the various sections of the highway system.

Table 1 shows the past and present traffic volumes on Kāhāmaha Highway and Kāhikū Highway at Station 31-K which is in close proximity to the project site and Waihee Road. Station 31-K is located at the junction of Kāhāmaha Highway and Kāhikū Highway and is approximately 1400 feet from the project site. The junction was created when the last portion of Kāhikū Highway was completed in 1972.

In 1976, the traffic volume on Kāhāmaha Highway was 12,706. By 1979, the traffic volume increased to 15,123. However, in 1981, the traffic volume showed a considerable reduction from the 1979 volume of 15,123 to 11,965 in 1981, a decrease of 3,158 vehicles or 20.88 per cent. The reduction in traffic volume may be attributed to the rising cost of transportation and to the decline in tourist travel.

Kāhāmaha Highway experienced a higher rate of growth of traffic between the years 1976 to 1979. As already stated, traffic increased from 12,706 in 1976 to 15,123 in 1979 or 7.97 per cent per year. For the one year

Table 1

Average Daily Traffic & Peak Hour Volumes  
Station 31-K

Kāhikū Highway At Kāhāmaha Highway & Ahaolele Road

Year	Kāhāmaha Highway		Kāhāmaha Highway North Leg	Ahaolele Road		Kāhikū Highway
	East Leg	West Leg		East Leg	West Leg	
2000	35,548 <sup>aa</sup>					
1990	25,821 <sup>aa</sup>					
1981	17,067 <sup>aa</sup>					
	11,965					
1980						13,996
1979	3,195		15,123	490		12,380
1978	4,717		14,285	674		13,460
1977						10,997
1976	2,078		12,706	583		11,061
1975						11,863
1974						11,468
1973 <sup>a</sup>						9,878

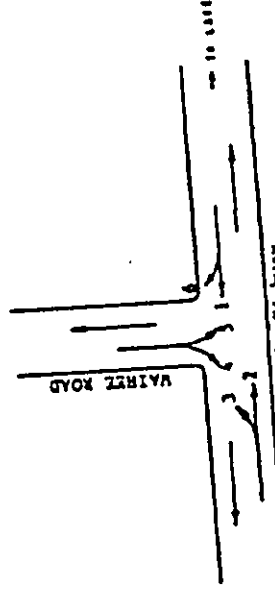
<sup>a</sup> Construction of last portion of Kāhikū Highway completed May, 1972.

<sup>aa</sup> Projected Volumes

Peak Hour Volumes

Year	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
1981			790	961
1978			934	1,134
1976	266	243	49	63
1979			791	1,024

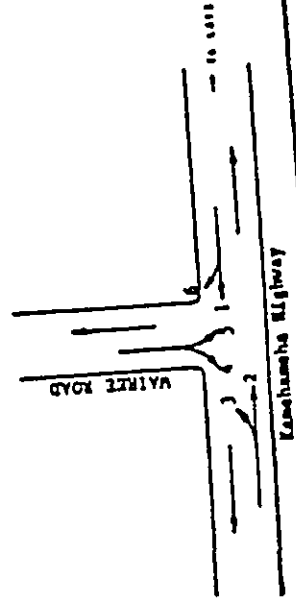
Table 2  
Weekend Traffic Volumes - June 5, 6 & 7, 1981  
Kanehamaha Highway At Wether Road



Time Period	Movements 1 & 4		Movements 2 & 3		Total - South Leg Movements 1 & 4, 2 & 3		12 Hour Volume	% of 12 Hour Volume
	Vol.	Sum.	Vol.	Sum.	Vol.	Sum.		
6:00 - 7:00 A.M.	178	122	127	178	345	266	511	1.63
7:00 - 8:00 A.M.	159	150	242	185	628	346	511	1.63
8:00 - 9:00 A.M.	148	242	165	155	608	317	465	1.45
9:00 - 10:00 A.M.	178	282	244	114	612	696	762	2.45
10:00 - 11:00 A.M.	177	397	154	153	623	724	762	2.45
11:00 - 12:00 P.M.	174	351	108	148	522	533	533	1.75
12:00 - 1:00 P.M.	166	167	145	145	465	465	465	1.52
1:00 - 2:00 P.M.	171	169	110	110	448	448	448	1.48
2:00 - 3:00 P.M.	153	172	154	128	437	376	376	1.25
3:00 - 4:00 P.M.	144	149	107	120	371	327	327	1.10
4:00 - 5:00 P.M.	110	117	110	110	330	330	330	1.10
5:00 - 6:00 P.M.	110	110	110	110	330	330	330	1.10
6:00 - 7:00 P.M.	110	110	110	110	330	330	330	1.10
7:00 - 8:00 P.M.	110	110	110	110	330	330	330	1.10
8:00 - 9:00 P.M.	110	110	110	110	330	330	330	1.10
9:00 - 10:00 P.M.	110	110	110	110	330	330	330	1.10
10:00 - 11:00 P.M.	110	110	110	110	330	330	330	1.10
11:00 - 12:00 A.M.	110	110	110	110	330	330	330	1.10
12:00 - 1:00 A.M.	110	110	110	110	330	330	330	1.10
1:00 - 2:00 A.M.	110	110	110	110	330	330	330	1.10
2:00 - 3:00 A.M.	110	110	110	110	330	330	330	1.10
3:00 - 4:00 A.M.	110	110	110	110	330	330	330	1.10
12 Hour Volume	1700	1710	1492	1432	4622	4622	4622	100.0
14 Hour Volume								

Peak Hour Volume

Traffic Volume & Turning Movement Counts  
Friday, June 5, 1981  
Kanehamaha Highway At Wether Road



Time Period	Movement 1		Movement 2		Movement 3		Total - South Leg Movements 1 & 4, 2 & 3	12 Hour Volume	% of 12 Hour Volume
	Vol.	Sum.	Vol.	Sum.	Vol.	Sum.			
6:00 - 7:00 A.M.	106	106	111	111	116	116	333	511	1.63
7:00 - 8:00 A.M.	151	151	124	124	145	145	420	511	1.63
8:00 - 9:00 A.M.	105	105	107	107	134	134	346	465	1.45
9:00 - 10:00 A.M.	71	71	310	310	153	153	633	762	2.45
10:00 - 11:00 A.M.	74	74	329	329	150	150	753	762	2.45
11:00 - 12:00 P.M.	69	69	317	317	154	154	740	762	2.45
12:00 - 1:00 P.M.	62	62	355	355	156	156	773	762	2.45
1:00 - 2:00 P.M.	59	59	350	350	140	140	749	762	2.45
2:00 - 3:00 P.M.	121	121	118	118	105	105	644	762	2.45
3:00 - 4:00 P.M.	96	96	153	153	108	108	657	762	2.45
4:00 - 5:00 P.M.	101	101	114	114	190	190	605	762	2.45
5:00 - 6:00 P.M.	72	72	110	110	129	129	531	762	2.45
6:00 - 7:00 P.M.									
7:00 - 8:00 P.M.									
8:00 - 9:00 P.M.									
9:00 - 10:00 P.M.									
10:00 - 11:00 P.M.									
11:00 - 12:00 A.M.									
12:00 - 1:00 A.M.									
1:00 - 2:00 A.M.									
2:00 - 3:00 A.M.									
3:00 - 4:00 A.M.									
12 Hour Volume	1107	1107	1490	1490	1608	1608	4205	4622	100.0
14 Hour Volume									

T-12

Table 3  
Traffic Volume & Turning Movement Counts  
Sunday, June 7, 1981  
Kanchameba Highway At Mathas Road

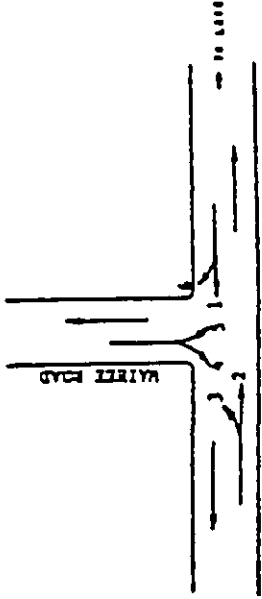
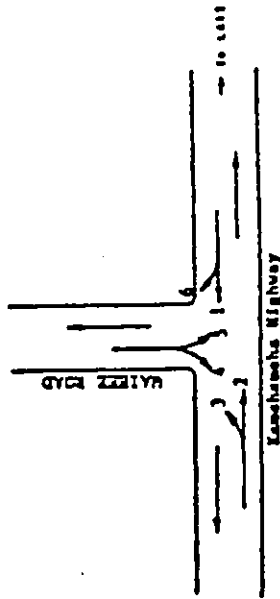


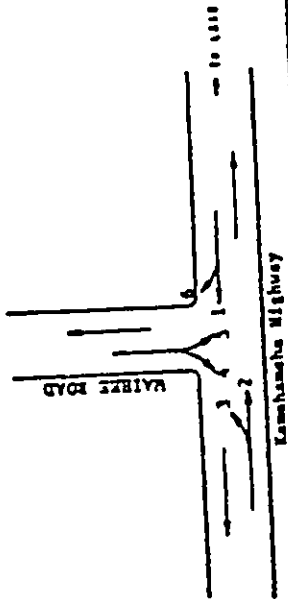
Table 4  
Traffic Volume & Turning Movement Counts  
Saturday, June 6, 1981  
Kanchameba Highway At Mathas Road



Time Period	Number of Vehicles			Total - South Leg Movements-1, 4, 2 & 3	2 of 12 Hour Volume	Number of Vehicles			Total - South Leg Movements-1, 4, 2 & 3	1 of 12 Hour Volume
	Movement					Movement				
	1	2	Total			1	2	Total		
5:00 - 6:00 A.M.										
6:00 - 7:00 A.M.	47	178	225	178	156	334	21	144	256	392
7:00 - 8:00 A.M.	59	218	277	218	210	428	40	186	316	370
8:00 - 9:00 A.M.	84	273	357	273	210	483	40	115	197	6.55
9:00 - 10:00 A.M.	88	317	405	317	247	564	86	114	695	7.57
10:00 - 11:00 A.M.	126	377	503	377	310	687	75	151	904	8.14
11:00 - 12:00 P.M.	194	494	688	494	420	914	84	151	904	9.97
12:00 - 1:00 P.M.	65	167	232	167	220	387	75	120	265	1.021
1:00 - 2:00 P.M.	77	171	248	171	220	391	70	110	298	1.085
2:00 - 3:00 P.M.	99	208	307	208	220	428	82	110	398	1.495
3:00 - 4:00 P.M.	112	271	383	271	220	491	66	127	594	1.695
4:00 - 5:00 P.M.	99	249	348	249	220	469	71	120	559	1.642
5:00 - 6:00 P.M.	145	317	462	317	220	537	80	120	657	1.920
6:00 - 7:00 P.M.										
7:00 - 8:00 P.M.										
8:00 - 9:00 P.M.										
9:00 - 10:00 P.M.										
10:00 - 11:00 P.M.										
11:00 - 12:00 A.M.										
12:00 - 1:00 A.M.										
1:00 - 2:00 A.M.										
2:00 - 3:00 A.M.										
3:00 - 4:00 A.M.										
4:00 - 5:00 A.M.										
12 Hour Volume	1586	4402	6088	4402	4017	8419	401	1625	917	
24 Hour Volume										

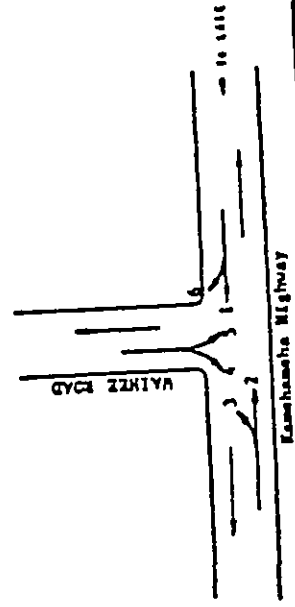


Table 6  
Weekend Traffic Volumes - June 5, 6 & 7, 1981  
Waihee Road At Kauhahamaha Highway



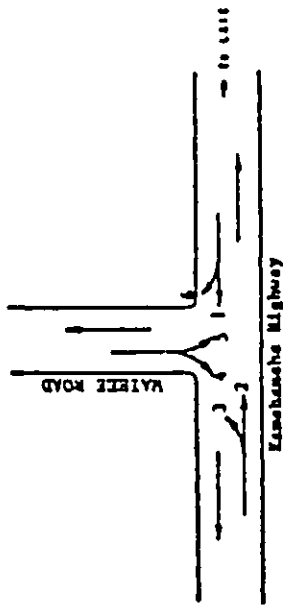
Time	Number of Vehicles Movements 4 & 5			Number of Vehicles Movements 7 & 8			Total-Both Directions Movements-4, 5, 7 & 8			Σ of 12 Hour Volume Fri.
	Fri.	Sat.	Sun.	Fri.	Sat.	Sun.	Fri.	Sat.	Sun.	
3:00 - 4:00 A.M.										6.22
4:00 - 5:00 A.M.										14.26
5:00 - 6:00 A.M.	113	52	30	48	45	29	151	07	68	8.74
6:00 - 7:00 A.M.	181	85	40	169	68	30	237	43	90	14.23
7:00 - 8:00 A.M.	124	98	59	77	124	45	201	202	104	8.74
8:00 - 9:00 A.M.	85	110	79	65	105	92	150	235	171	6.08
9:00 - 10:00 A.M.	83	142	91	67	142	87	150	284	176	6.08
10:00 - 11:00 A.M.	80	123	89	60	109	92	148	211	181	6.08
11:00 - 12:00 P.M.	73	76	80	81	91	83	144	167	163	6.24
12:00 - 1:00 P.M.	79	110	96	82	107	96	180	217	193	6.24
1:00 - 2:00 P.M.	47	116	76	76	111	89	222	214	165	11.02
2:00 - 3:00 P.M.	120	117	73	120	75	78	230	192	151	9.22
3:00 - 4:00 P.M.	112	109	104	135	79	91	247	187	155	10.01
4:00 - 5:00 P.M.	94	104	89	119	74	104	211	179	193	9.44
5:00 - 6:00 P.M.										
6:00 - 7:00 P.M.										
7:00 - 8:00 P.M.										
8:00 - 9:00 P.M.										
9:00 - 10:00 P.M.										
10:00 - 11:00 P.M.										
11:00 - 12:00 M.A.M.										
12:00 - 1:00 A.M.										
1:00 - 2:00 A.M.										
2:00 - 3:00 A.M.										
3:00 - 4:00 A.M.										
12 Hour Volume	1,286	1,342	917	1,182	1,105	932	2,368	2,147	1,844	
24 Hour Volume										

Table 7  
Traffic Volume & Turning Movement Counts  
Friday, June 5, 1981  
Waihee Road At Kauhahamaha Highway



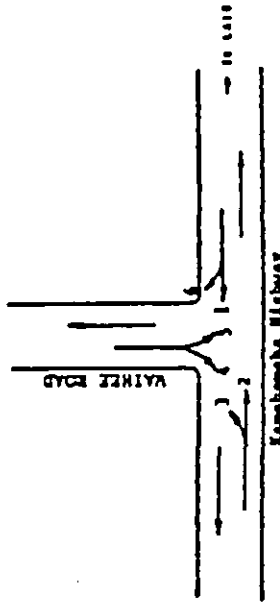
Time	Number of Vehicles Movements			Number of Vehicles Movements			Σ of 12 Hour Volume
	Fri.	Sat.	Sun.	Fri.	Sat.	Sun.	
3:00 - 4:00 A.M.							6.22
4:00 - 5:00 A.M.							14.26
5:00 - 6:00 A.M.	106	7	113	30	12	48	161
6:00 - 7:00 A.M.	161	22	183	145	24	169	332
7:00 - 8:00 A.M.	103	19	124	37	20	77	251
8:00 - 9:00 A.M.	71	14	85	51	12	65	150
9:00 - 10:00 A.M.	74	9	81	60	7	67	140
10:00 - 11:00 A.M.	69	11	80	61	7	68	134
11:00 - 12:00 P.M.	62	11	73	69	13	81	154
12:00 - 1:00 P.M.	69	9	78	75	7	82	160
1:00 - 2:00 P.M.	121	20	141	105	26	131	273
2:00 - 3:00 P.M.	96	24	120	102	18	120	240
3:00 - 4:00 P.M.	101	11	112	117	18	135	247
4:00 - 5:00 P.M.	72	22	94	129	10	139	233
5:00 - 6:00 P.M.							
6:00 - 7:00 P.M.							
7:00 - 8:00 P.M.							
8:00 - 9:00 P.M.							
9:00 - 10:00 P.M.							
10:00 - 11:00 P.M.							
11:00 - 12:00 M.A.M.							
12:00 - 1:00 A.M.							
1:00 - 2:00 A.M.							
2:00 - 3:00 A.M.							
3:00 - 4:00 A.M.							
12 Hour Volume	1,107	179	1,286	1,003	174	1,182	2,368
24 Hour Volume							

Table 8  
Traffic Volume & Turning Movement Counts  
Saturday, June 6, 1981  
Waihee Road At Kaneohe Highway



Time Period	Number of Vehicles Movements			Total-Both Directions Movements 4 & 5, 3 & 6	1 of 12 Hour Volume
	1	2	3		
5:00 - 6:00 A.M.					
6:00 - 7:00 A.M.	5	37	8	45	47
7:00 - 8:00 A.M.	69	85	15	169	153
8:00 - 9:00 A.M.	84	98	17	199	202
9:00 - 10:00 A.M.	88	110	21	219	225
10:00 - 11:00 A.M.	125	142	24	291	294
11:00 - 12:00 M.	95	123	14	232	237
12:00 - 1:00 P.M.	66	76	12	154	157
1:00 - 2:00 P.M.	94	110	18	222	227
2:00 - 3:00 P.M.	89	116	14	219	224
3:00 - 4:00 P.M.	18	117	65	192	192
4:00 - 5:00 P.M.	39	11	58	108	107
5:00 - 6:00 P.M.	92	12	104	104	108
6:00 - 7:00 P.M.					
7:00 - 8:00 P.M.					
8:00 - 9:00 P.M.					
9:00 - 10:00 P.M.					
10:00 - 11:00 P.M.					
11:00 - 12:00 A.M.					
12:00 - 1:00 A.M.					
1:00 - 2:00 A.M.					
2:00 - 3:00 A.M.					
3:00 - 4:00 A.M.					
12 Hour Volume	1047	1242	919	186	2347
24 Hour Volume					

Table 9  
Traffic Volume & Turning Movement Counts  
Sunday, June 7, 1981  
Waihee Road At Kaneohe Highway



Time Period	Number of Vehicles Movements			Total-Both Directions Movements 4 & 5, 3 & 6	1 of 12 Hour Value
	1	2	3		
5:00 - 6:00 A.M.					
6:00 - 7:00 A.M.	11	6	24	41	168
7:00 - 8:00 A.M.	35	5	40	80	487
8:00 - 9:00 A.M.	31	8	40	79	562
9:00 - 10:00 A.M.	67	12	79	158	935
10:00 - 11:00 A.M.	77	16	91	184	1032
11:00 - 12:00 M.	71	15	84	170	979
12:00 - 1:00 P.M.	77	1	80	158	881
1:00 - 2:00 P.M.	82	22	84	188	1038
2:00 - 3:00 P.M.	65	11	76	152	892
3:00 - 4:00 P.M.	69	15	73	157	817
4:00 - 5:00 P.M.	91	11	74	176	1015
5:00 - 6:00 P.M.	81	6	89	176	1044
6:00 - 7:00 P.M.					
7:00 - 8:00 P.M.					
8:00 - 9:00 P.M.					
9:00 - 10:00 P.M.					
10:00 - 11:00 P.M.					
11:00 - 12:00 A.M.					
12:00 - 1:00 A.M.					
1:00 - 2:00 A.M.					
2:00 - 3:00 A.M.					
3:00 - 4:00 A.M.					
12 Hour Volume	806	111	917	813	4819
24 Hour Volume					

Table 10  
Average Daily Traffic, Saturday & Sunday Traffic Volumes  
Kamehameha Highway At Waiehe Road

Year	Average Daily Traffic	Saturday Traffic Volume	Sunday Traffic Volume
2000	35,548 <sup>a</sup> 24,919 <sup>aa</sup>	38,833 <sup>a</sup> 27,222 <sup>aa</sup>	26,113 <sup>a</sup> 25,315 <sup>aa</sup>
1990	25,821 <sup>a</sup> 18,100 <sup>aa</sup>	28,206 <sup>a</sup> 19,772 <sup>aa</sup>	26,231 <sup>a</sup> 18,388 <sup>aa</sup>
1981	17,067 <sup>a</sup> 11,965	18,671 <sup>a</sup> 13,429	17,338 <sup>a</sup> 11,064
1980	-	-	-
1979	15,123	-	-
1978	14,285	-	-
1977	-	-	-
1976	12,204	-	-
1975	-	-	-

<sup>a</sup> Projected  
<sup>aa</sup> Probable actual volume

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Peak Hour Volumes

Year	Friday	Saturday	Sunday
2000	2,855 <sup>a</sup> 1,991 <sup>a</sup>	3,292 <sup>a</sup> 2,293 <sup>a</sup>	2,968 <sup>a</sup> 2,070 <sup>a</sup>
1990	2,074 <sup>a</sup> 1,446 <sup>aa</sup>	2,391 <sup>a</sup> 1,667 <sup>aa</sup>	2,155 <sup>a</sup> 1,503 <sup>aa</sup>
1981	1,378 <sup>a</sup> 961	1,589 <sup>a</sup> 1,108	1,432 <sup>a</sup> 999
1980	-	-	-
1979	-	-	-
1978	1,134	-	-
1977	-	-	-
1976	-	-	-
1975	-	-	-

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period from 1978 to 1979, the traffic volume increased at a slower rate from 14,285 in 1978 to 15,123 in 1979 or 5.87 per cent per year. Although traffic volumes have shown a considerable reduction in 1981 and since highway facilities are more permanent than the land uses, traffic projections should be high for sound planning so that the highway system will be able to accommodate changing requirements and unpredictable future land uses.

To assure that the traffic projections will still be valid for the future, the higher rate of growth of 7.97 per cent per year will be used. On the basis of the increase in traffic volume at the rate of 7.97 per cent per year from 1976, the projected future traffic volumes on Kamehameha Highway at Station 31-K should total 17,067 for 1981, 25,821 for 1990 and 35,548 for the year 2000. Station 31-K being in close proximity to the project site, the projected future traffic volume will be considered as representative of the traffic volume on Kamehameha Highway at Waiehe Road.

Since Kamehameha Highway is a popular tourist route and critical traffic conditions usually occur on weekends, the consultant conducted traffic volume and turning movement counts at the intersection of Kamehameha Highway and Waiehe Road for a 3 day weekend on June 5, 6 and 7, 1981 to determine the characteristics and variations in traffic flow on a Friday, Saturday and Sunday. These traffic volume and turning movement counts were taken for each 15 minute period from 6:00 a.m. to 6:00 p.m. (12 hours) and are shown on Tables 2 to 9.

Weekend traffic on Kamehameha Highway reflects recreational and social travel and is higher than the weekday traffic. The weekday traffic usually depicts a pattern of two distinct peak hours, one in the morning and another in the afternoon, whereas weekend traffic will exhibit one, usually pronounced peak in the afternoon.

Attention is also directed to the fact that a roadside survey was conducted by the Department of Transportation Services in the summer of 1971 to obtain information on tourist travel in the Windward area. The survey indicated that on Kamehameha Highway at Kahalo, the average daily traffic or 24 hour volume of tourist traffic was approximately 2,600 vehicles. The total 24 hour volume was 8,648 vehicles, so that the tourist traffic represented approximately 30.1 per cent of the total 24 hour volume. Thus, were it not for the tourist or recreational traffic, traffic volumes on Kamehameha Highway would be considerably less than it would otherwise be.

An analysis of Table 2 indicates that for the weekend traffic on Kamehameha Highway at Waiehe Road, the 12 hour volume from 6:00 a.m. to 6:00 p.m. is the highest on a Saturday and the lowest on a Friday. The 12 hour volume are 8,974 vehicles on Friday, 9,803 on Saturday and 9,117 on Sunday. The Sunday traffic volume, therefore, is 101.59 per cent of the Friday traffic volume and the Saturday traffic volume is 109.24 per cent of the Friday traffic volume. Using these factors, it is possible to convert the future weekday traffic volume to a Sunday or Saturday traffic volume.

From previous traffic volume surveys conducted in the Windward area, it has been determined that the 12 hour volumes are approximately 75 per

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Table 11  
Peak Hour Time Intervals - 1981  
Wahehe Road And Kamehameha Highway

		T H M	
		Saturday	Sunday
<u>A.M. Peak</u>			
Wahehe Road	7:00-8:00 A.M.	10:00-11:00 A.M.	11:00-12:00 A.M.
Kamehameha Highway	11:00-12:00 M.	11:00-12:00 M.	11:00-12:00 M.
<u>P.M. Peak</u>			
Wahehe Road	2:00-3:00 P.M.	1:00- 2:00 P.M.	4:00- 5:00 P.M.
Kamehameha Highway	5:00-6:00 P.M.	2:00- 3:00 P.M.	3:00- 4:00 P.M.

Table 10 shows the projected future traffic volumes on Kamehameha Highway at Wahehe Road with conversion of the average daily traffic to Saturday and Sunday traffic volumes. It will be noted that since the highest rate of growth was used for the traffic projections from the year 1976, the traffic projection for 1981 totals 17,067 vehicles, whereas the actual volume is only 11,965 vehicles. Accordingly, the probable actual volumes are also indicated in Table 10.

The traffic volumes generated by the project, however, have already been included into the projected future traffic volumes on Kamehameha Highway and Wahehe Road and need not again be counted. The inclusion is on the basis of the projections of future traffic volumes wherein it was assumed that there will be continuation of a high level of activity and growth in the Kahala District, and that other projects in the Kahala District will take place which will maintain the high level of increase in traffic volumes on Kamehameha Highway. Furthermore, all factors were considered in the projections of future traffic volumes along Kamehameha Highway, including vacant and agricultural land in the area and growth in the resort industry.

The capacity of Kamehameha Highway will determine whether or not these future traffic volumes can be accommodated by the highway network. As an explanation, the capacity of a highway is a measure of its ability to accommodate traffic and is represented by the maximum number of vehicles that can be carried under prevailing roadway and traffic conditions. It should be emphasized that the capacity of a highway is not directly comparable to the capacity of a container of enclosed space. The capacity is a rate instead of a quantity.

cent of the 24 hour volume on a Friday, 73.0 per cent on a Saturday and 82.4 per cent on a Sunday. Using these factors, the 24 hour volumes, as shown in Table 2 are as follows: 11,965 for Friday, 13,479 for Saturday and 11,966 for Sunday. The 24 hour volume of 11,965 vehicles on Friday indicates that traffic volumes on Kamehameha Highway have not been increasing as expected. As shown in Table 1, the projected 1981 traffic volume at Station 31-K is 17,067. Thus, the projected traffic volumes for 1981, 1990 and the year 2000 will be considerably higher than the actual traffic volume that will be on Kamehameha Highway during future years, so that the traffic projections will still be valid for the future.

The peak hour volumes on Kamehameha Highway follow the same pattern as the 12 hour volumes, being the highest on a Saturday and the lowest on a Friday. The peak hour volumes are 961 vehicles on Friday, 1,108 on Saturday and 999 vehicles on Sunday. The Saturday peak hour volume, therefore, is 115.30 per cent of the Friday peak hour volume and the Sunday peak hour volume is 103.95 per cent of the Friday peak hour volume. These factors will be used to convert the future weekday peak hour volumes to a Saturday or Sunday peak hour volume. It should be emphasized that the peak hour time intervals for the weekend traffic occur on different hours of the day on a Friday, Saturday and Sunday and are as follows: 5:00 p.m. to 6:00 p.m. on a Friday, 2:00 p.m. to 3:00 p.m. on a Saturday and 3:00 p.m. to 4:00 p.m. on a Sunday.

As shown in Table 6, the weekend traffic volumes, including the peak hour volumes on Wahehe Road do not exhibit the same pattern as the traffic volumes on Kamehameha Highway. On Wahehe Road, the 12 hour volume from 6:00 a.m. to 6:00 p.m. is the highest on a Friday and the lowest on a Saturday, whereas, on Kamehameha Highway the 12 hour volume is the highest on a Saturday and the lowest on a Friday. The peak hour volumes on Wahehe Road follow the same pattern as the 12 hour volumes, being the highest on a Friday and the lowest on a Saturday. The peak hour volume on Wahehe Road are very light, considering the fact that Wahehe Road is a secondary street with a right of way width of 60 feet and pavement width of 40 feet. For a secondary street with a right of way width of 60 feet with no parking and at grade intersection, the capacity is approximately 850 vehicles per hour in one direction and 1,275 for both directions of travel at Level of Service C. The highest peak hour volume, the Friday peak hour volume from 3:00 a.m. to 6:00 a.m. is only 352 vehicles for both directions of travel, with 183 vehicles leaving and 169 vehicles entering Wahehe Road. Wahehe Road, therefore, will be adequate to meet not only present vehicular demands, but also future increases as well.

With the proper spacing of the peak hour time intervals, there is not the conflict or overlap of peak hour volumes with those of either Wahehe Road or Kamehameha Highway. The peak hour time intervals on Wahehe Road and on Kamehameha Highway are shown in Table 11. The significant differences in peak hour characteristics result in an equalization and spacing of the traffic load on Kamehameha Highway and thus, will not substantially affect the capacity of Kamehameha Highway. The weekend traffic volumes, therefore, will be used to determine the traffic impact on the highways.

TRAFFIC GENERATION

Traffic generation data or the number of trips generated by the project will make it possible to determine whether significant adverse effects will be produced on the highway system, the neighborhood and the community. The data will also determine how many additional cars can be accommodated by the highway network.

Since each type of land use has its own distinctive traffic generation characteristics and differ in the amount and intensity of traffic generated, peak hour time interval, directional distribution of peak hour movement, hourly distribution of traffic, type and composition of traffic, time variation in traffic flow and other variables, the traffic generated by the two land uses and its impact on the street system will be considered separately. What should be emphasized, however, is that of all the traffic generation characteristics, the most important is the peak hour traffic at different hours of the day and its effect on the highway at the time of the highway's peak loading condition.

Residential Land Use

The traffic generated by the residential land use is directly related to the number of dwelling units in the project. Inasmuch as traffic generation for the same types of land uses is surprisingly similar, it would be proper and reasonably accurate to assume that the trip and household characteristics of a typical or average single family dwelling unit in Honolulu would be applicable to the dwelling units of this project.

Tables 12 and 13 show the trip and household characteristics that would be typical of dwelling units of the development. Each dwelling unit or household may be expected to own 1.8 automobiles and generate 8 trips per day. The number of trips made for the purpose of work is fairly constant throughout the week, and can be estimated with reasonable accuracy from employment. Using these various factors, it is possible to analyze traffic conditions that may be expected to occur on the highway system and thus measure the present and future demand for service.

Table 12  
TRIP CHARACTERISTICS - ALL MODES

Trips Per Person	2.1	Trips To Work Per Employed Person	0.7	Trips Per Dwelling Unit	6.
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Kahehaha Highway presently is a two-lane highway classified as a minor arterial and designated as a Federal-aid Primary highway. Being a higher type facility, its capacity is similar to that for uninterrupted flow conditions. Under ideal conditions, the capacity of a two-lane, two-way roadway is approximately 2,000 passenger vehicles per hour, total, regardless of distribution by direction. It is to be expected, however, that the actual capacity of Kahehaha Highway would vary substantially from the maximum capacity. For design purposes, the capacity based on at grade intersection will be applied since street capacity is generally controlled by the capacity at intersections.

Using approximate calculations, the capacity of a roadway with a pavement width of 22 feet with no parking and at grade intersection is approximately 600 vehicles per hour in one direction and 900 vehicles per hour for both directions of travel at Level of Service C. The calculated capacity figures, however, is conservative and the probable or actual capacity of Kahehaha Highway can be determined when comparison is made with the maximum observed traffic volumes recorded as early as 1961 on similar classifications of highways throughout the United States.

On two-lane two-way highways, the highest reported hourly volumes ranged from 1,605 to 1,871 for both directions of travel as compared to the capacity of 2,000 vehicles under ideal conditions and uninterrupted flow conditions and as compared to the calculated capacity of 900 vehicles per hour for both directions of travel. The average daily traffic reported for both directions ranged from 15,935 to 22,275. On four-lane two-way highways, the highest reported hourly volumes ranged from 2,892 to 4,958 vehicles per hour for both directions of travel. The average daily traffic reported for both directions ranged from 35,758 to 45,000. That the calculated capacity is very conservative and the actual capacity will be considerably higher is substantiated by past and present traffic volume counts.

There is, therefore, justification to expect that Kahehaha Highway under present conditions of a two-way two lane highway will have a capacity ranging from 1,605 to 1,871 vehicles per hour for both directions of travel at Level of Service C, inasmuch as the directional distribution of the peak hour volumes are nearly equal in either direction. The projected Saturday peak hour volumes are 2,391 vehicles per hour for the year 1990 and 2,292 vehicles per hour for the year 2000. The probable actual Saturday peak hour volumes, however, will be 1,667 vehicles per hour for the year 1990 and 2,295 vehicles per hour for the year 2000.

Kahehaha Highway under present conditions, therefore, will have sufficient capacity to accommodate present as well as future vehicular demands to the year 1990. Beyond 1990, the future highway system will require the improvement of Kahehaha Highway to a 4-lane divided highway. This improved 4-lane divided highway should have a capacity ranging from 2,892 to 4,958 vehicles per hour for both directions of travel and be able to accommodate an average daily traffic volume within the range of 35,758 to 45,000 vehicles. The future highway system not only will be adequate but will have considerable excess capacity and mitigate at a future time any possible undesirable traffic congestion.

Table 13  
HOUSEHOLD CHARACTERISTICS

Auto Per Dwelling Unit	1.8
Persons Per Dwelling Unit	4.1
Employed Persons Per Dwelling Unit	1.6

Table 14

TRIP GENERATION

No. of Units	No. of Auto	No. of Persons	Work Trips	24 Hour Volume	Peak Hour Volume
21	38	34	24	168	14

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On the basis of these factors, the 24 hour and peak hour volumes were developed as shown in Table 14. The 21 dwelling units will generate a 24 hour volume of 168 trips and a peak hour volume of 14 trips.

The trip volume so developed, including the 24 hour volume and peak hour volume will be higher than the actual volumes to be generated by the 21 dwelling units. The trip characteristics values actually refer to trips by all modes of travel from all origins to all destinations, including auto passenger trips and transit trips. Considering the mode of travel and car occupancy factors, a maximum of 84 per cent of the peak hour volume would actually constitute auto driver trips.

The peak hour volume of 14 trips is at the rate of one trip per 4.79 minutes and is so negligible that its impact on the highway system will be disregarded.

COMMERCIAL - RETAIL COMPLEX

As set forth in the description of the project, the commercial retail complex which will include a food market, restaurants, general commercial and retail establishments will have a total floor area of 96,000 square feet with supporting parking facilities for 284 parking spaces. The complex is not sufficiently large to be truly classified as a shopping center. However, to assure that a sufficient margin of safety is built into the analysis, higher than normal traffic generation figures will be used, so that the traffic projections will still be valid for the future. Accordingly, the highest values of shopping center characteristics will be used to provide a more realistic figure for traffic generation.

Due to its complementary traffic generation characteristics, the commercial-retail complex will cause only a mild traffic impact on the highway network during the peak commuting hours. The pattern of hourly activities at a shopping center is quite different from the peak commuting hours on a highway. Typically, the peak commuting hours on a highway are hours of subdued activity at a shopping center. The peak hours at a shopping center occur either during the weekends or evening hours, with the evening peak hours being a higher percentage than the daytime peak hours.

Research studies of shopping centers in the United States indicate that whether or not there is evening shopping, the percentage of all shopping center trips occurring during the normal peak highway hours from 4:00 P.M. to 6:00 P.M. is remarkably constant. For all centers, the average hourly volume of shopping center trips was only 6.6 per cent of the daily total. Their directional flow is opposite to that of the residential land uses so that there is not the competition for highway space and, therefore, less traffic congestion. The expected patterns of hourly distribution of shopping trips for daytime shopping and evening shopping are set forth in Tables 15 and 16.

Table 15  
Hourly Distribution of Shopping Trips  
Daytime Shopping

Time of Day	Percentage of Total Trips	No. of Trips
7:30 - 8:30 A.M.	1.2%	53
8:30 - 9:30 A.M.	10.2%	432
9:30 - 10:30 A.M.	15.0%	632
10:30 - 11:30 A.M.	9.2%	390
11:30 - 12:30 P.M.	8.5%	358
12:30 - 1:30 P.M.	8.7%	369
1:30 - 2:30 P.M.	12.0%	411
2:30 - 3:30 P.M.	9.7%	411
3:30 - 4:30 P.M.	5.5%	232
4:30 - 5:30 P.M.	4.0%	168
5:30 - 6:30 P.M.	5.0%	211
6:30 - 7:30 P.M.	1.0%	42
7:30 - 8:30 P.M.	-	-
8:30 - 9:30 P.M.	-	-

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HASS TRANSPORTATION

The project area is presently served by one (1) bus route, Route 52, Honolulu-Waialeale-Kaneohe. Average headway is approximately 30 minutes, peak and off-peak periods and service is available on Saturdays and Sundays.

Route 52 provides around-the-island coverage. Buses from Honolulu proceed along Kaneohe Highway and serve Aiea, Pearl City, Hilliani, Waialeale, the North Shore, Kalaheo and Kona and return to Honolulu via the Pali Highway. Service is also provided in the opposite direction. The travel time by public transportation from Honolulu (Ala Moana Center) to the project site is approximately 1 hour.

With such a long travel time by public mass transportation, no reliance was made on public mass transportation to reduce the traffic impact of the project. The traffic analysis was based entirely on the use of the automobile for maximum impact and the 24 hour volume and the peak hour volume reflect this assumption.

Hass transportation, therefore, was considered only as a possible mitigating factor which may mitigate in the future, the adverse consequences of traffic and improve the traffic flow on the highway and street systems.

PARKING

So as to create a minimum of adverse environmental impact and to minimize traffic congestion, more parking than is required by the Comprehensive Zoning Code will be provided. The parking facility will be designed to complement landscape and traffic control plans for the neighborhood and the community.

Approximately 284 parking spaces will be provided, compared to 263 parking spaces required by the Code. All of these spaces will be street level parking. To facilitate traffic movement and to minimize traffic congestion, entrances and exits will be located at both Kaneohe Highway and Waialeale Road. A separate driveway for service vehicles and employee parking is proposed with access from Waialeale Road, away from the major highway, Kaneohe Highway.

From the standpoint of commercial success, the provision of adequate parking, therefore, should not create a traffic congestion problem on any of the approach roads to the project.

CONCLUSION

Analyzing the various factors, it may be concluded the proposed project will not add substantially to the traffic problems to create an

Table 16

Hourly Distribution of Shopping Trips Evening Shopping

Time of Day	Percentage of Total Trips	No. of Trips
7:30 - 8:30 A.M.	0.25%	11
8:30 - 9:30 A.M.	3.25%	137
9:30 - 10:30 A.M.	9.50%	400
10:30 - 11:30 A.M.	11.75%	495
11:30 - 12:30 P.M.	2.50%	105
12:30 - 1:30 P.M.	8.75%	360
1:30 - 2:30 P.M.	10.75%	432
2:30 - 3:30 P.M.	6.50%	274
3:30 - 4:30 P.M.	6.75%	284
4:30 - 5:30 P.M.	8.25%	348
5:30 - 6:30 P.M.	7.25%	306
6:30 - 7:30 P.M.	18.75%	790
7:30 - 8:30 P.M.	6.00%	253
8:30 - 9:30 P.M.	0.50%	21
9:30 - 10:30 P.M.	-	-

Traffic Generation rates for shopping centers in the United States

range between 30 and 392 trips per acre of land area, with a mean of 160. At 160 trips per acre, the 7.023 acres of the project will generate approximately 1,124 trips per day during the hours that the shopping center is operating. The hours of operation of the shopping complex will be from 9:30 A.M. to 5:30 P.M. without evening shopping and from 9:30 A.M. to 9:00 P.M. with evening shopping. Using the highest value of 392 trips per acre, the project will generate 3,753 trips.

Traffic generation rates for regional shopping centers range between 400 to 700 trips per acre with a mean of 600. The generation rate of 600 trips per acre, therefore, will be used. At 600 trips per acre, the traffic generated by the project will result in 4,214 trips per day.

As shown in Tables 15 and 16, the peak hour volumes generated by the shopping complex for daytime shopping will occur in the morning between 9:30 to 10:30 A.M. and in the afternoon between 3:30 to 4:30 P.M., after the morning peak commuting hours and before the afternoon peak commuting hours. With evening shopping, the peak hour volumes generated by the shopping complex will occur in the morning between 10:30 to 11:30 A.M. and in the evening between 6:30 to 7:30 P.M., after both the morning and afternoon peak commuting hours. Thus, it will not be difficult to make a trip to the complex at any time. Free from hazards and traffic congestion. Since highways must be designed to meet peak hour commuting demands, the roadway network will be able to accommodate the traffic generated by the shopping complex at an acceptable level of service.

adverse impact. Although Kamehameha Highway under present conditions will have sufficient capacity to accommodate present as well as future traffic demands to the year 1990, the future highway system with Kamehameha highway improved to a 4-lane divided highway will provide considerable excess capacity and further mitigate at a future time any possible undesirable traffic congestion. The development will make possible the achievement of desirable social and economic improvements for the area.



APPENDIX I

MARKET STUDY

**COWELL & CO., INC.**  
REAL ESTATE CONSULTANTS  
1414 Hawaii Building 745 Fort Street  
Honolulu, Hawaii 96813  
(808) 524-5490 or 536-4988

Don R. Cowell, MAI, CRE  
Irmgard G. Patterson, MAI  
William J. Dornbush

October 16, 1981

Gray, Hong & Associates, Inc.  
116 South King Street, Room 508  
Honolulu, Hawaii 96813

Attention: Mr. David Bills, P.E.

Gentlemen:

Subject: Market Study Regarding Industrial Development and Potential Demand, Kahaluu, Kaneohe and Kailua Areas, Koolaupoko District, Windward Oahu

In response to your request, Cowell & Co., Inc. has completed a market study covering industrial development that has occurred on the lands zoned for industrial use in the areas of Kahaluu, Kaneohe and Kailua, Windward Oahu.

Alexander & Baldwin, Inc. owns approximately 26 acres of land situated on the makai and mauka sides of Kamehameha Highway, just north of Waihee Road in Kahaluu. This land is identified as Tax Map Key 4-7-13, Parcels 1, 10, 11, 12, 16 and 24. Approximately 13 acres of this land is zoned Industrial (I-1) and the balance of the land is zoned Residential (R-3 and R-6). Alexander & Baldwin, Inc. proposes to develop a light industrial subdivision containing 21 lots, averaging about a half acre per lot, on their lands that are zoned for industrial use.

The purpose of this market study has been to survey the lands that are zoned for industrial use that are located in the Kahaluu, Kaneohe and Kailua areas of Windward Oahu and, based upon this analysis and other investigations, determine if there is a demand for additional industrial lots in Windward Oahu. Details regarding our market investigations and analyses are summarized in this report. Further details regarding our investigations, as well as maps locating industrial zoned lands located in Windward Oahu and other maps, are contained in our files and are available for review upon request. We understand that this market study will be used in a draft EIS covering the proposed Kahaluu industrial subdivision. Readers of this market study should be aware that Cowell & Co., Inc. has been retained to serve as project manager for Alexander & Baldwin, Inc. with respect to the proposed Kahaluu industrial subdivision. However, the opinions and conclusions stated in this letter are based upon objective analysis of our market survey and investigations.

The first portion of our market study involved researching zoning maps at the Department of Land Utilization regarding all land parcels zoned for industrial use located in the Koolaupoko District and including the areas of Kailua, Kaneohe and Kahaluu, Windward Oahu. A summary of all parcels currently zoned for industrial use in these areas is contained in Exhibits 1 and 2. The total land area presently zoned for industrial use in this area approximates 253 acres. However, this figure includes the Kaneohe Sewage Treatment Plant (15.895 acres), Kapaa Quarry (22.236 acres) and Valley of the Temples Cemetery (120+ acres). Excluding these atypical industrial sites, land presently zoned for industrial use in the Koolaupoko District approximates 95 acres.

The next portion of the study involved conducting a field survey inspecting all of the parcels zoned for industrial use in the subject areas of Windward Oahu. The purpose of the field inspection was to determine the type of industrial improvements that have been developed in the subject areas, the type of occupants or tenants that have located on these sites and to determine the amount of industrial zoned land that remains vacant. Tables summarizing the results of our field inspections are attached to this letter. A summary of pertinent data revealed by our research and field inspections is summarized below.

<u>Location</u>	<u>Land Area<sup>1/</sup> (Acres) Zoned Industrial</u>	<u>Land Area<sup>1/</sup> (Acres) Improved</u>	<u>Land Area<sup>1/</sup> (Acres) Vacant</u>
WYCO Subdivision, Kailua	18.42	18.42	0
Heeia Industrial Park (Kahuhipa Street, Kaneohe)	23.11	23.11	0
Kaneohe Industrial Area (Kamehameha Highway)	18.90	18.36	0.54
Kahaluu Industrial Area (North of Kaneohe Town)	<u>34.87</u>	<u>12.45</u>	<u>22.42</u>
TOTALS	95.30	72.34	22.96

Analysis of the data summarized in this report indicates that there are virtually no industrial zoned parcels remaining vacant in the Kailua industrial area and that there is only a very limited amount of industrial zoned land remaining vacant in Kaneohe Town. The total land area zoned for industrial use located in Kailua and Kaneohe Town totals about 60 acres, of which only less than one acre remains vacant and available for development.

Our research revealed that approximately 35 acres of land are currently zoned for industrial use in the Kahaluu area. However, approximately 12 acres of this land are presently improved with commercial/industrial structures and/or older residential units. About 3 acres of industrial zoned land in Kahaluu is owned by the government and planned for park use. As shown on the tables attached to this letter, about 8 acres of land situated on the makai side of Kamehameha Highway and located north of the junction of Kamehameha Highway and Wailehua Road are substantially improved with older residential units. This land has been subdivided into smaller lots, many of which are served by unpaved roads. Due to the dispersed ownership of these small parcels, as well as the fact that they are improved with older residential units and have poor access, in many instances, the potential for industrial utilization of these parcels is limited. Our research indicates that there are only about 20 acres of industrial zoned land in the Kahaluu area that are available for future industrial development.

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<sup>1/</sup> Excludes Kapaa Quarry, Kaneohe Sewage Treatment Plant and Valley of the Temples Cemetery.

Our investigations revealed that there are only two land "parcels" that are of significant size and of a land tenure that would permit orderly development of an industrial subdivision in the subject areas covered in our study. These land parcels include approximately 13 acres of industrial zoned land owned by Alexander & Baldwin, Inc. at Kahaluu and another parcel identified as Tax Map Key 4-7-58-1 owned by Ocean View Cemetery, Ltd. and Market City, Ltd. The land owned by Alexander & Baldwin, Inc. is situated on the southerly side of North Waihee Stream, while the land owned by Ocean View Cemetery, Ltd. and Market City, Ltd. is situated on the northerly side of North Waihee Stream and contains about 6 acres zoned for industrial use. With the exception of these parcels, most of the other land parcels located in the subject areas that are zoned for industrial use offer only modest potential for future industrial development in the near future due to the fact that most of the other industrial zoned parcels are improved or are of modest size and are owned by dispersed entities.

In order to form opinions regarding availability of land and potential demand for future industrial development in the subject areas of Windward Oahu, we have analyzed the amount of land designated for industrial use on the proposed Development Plan within various areas of Oahu and compared it to the number of residents in each of these areas. Details regarding these statistics are included in Exhibit 4 attached to this letter. The overall ratio of the 1980 resident population to acres of industrial designated land per the proposed Development Plans for the Island of Oahu approximates 191 persons per industrial acre. The corresponding ratio for districts on Oahu is shown below:

<u>District</u> <sup>1/</sup>	<u>1980 Census Resident Population</u>	<u>Potential Industrial Land Per Development Plan (Acres)</u>	<u>Ratio - Population to Industrial Land (Persons/Acre)</u>
Island of Oahu	762,874	4,001.84	191
Primary Urban Center	418,190	1,773.62	236
Ewa	36,255	1,752.86	21
Central Oahu	99,939	311.07	321
East Honolulu	42,263	0	-
Koolaupoko (subject)	109,373	93.79	1,166
Koolauloa	14,195	0	-
North Shore	9,849	36.29	271
Waianae	32,810	34.20	959

<sup>1/</sup> Further details regarding the above statistics are contained in the attached table as Exhibit 4.

It is noted that the Koolaupoko District had a 1980 census resident population of 109,373 persons, representing about 14.3 percent of Oahu's resident population. It is further noted that although the Koolaupoko District contains a significant portion of the island's resident population, it contains only about 2.3 percent of Oahu's industrial designated land per the proposed Development Plan. Assuming that the Development Plans are adopted as proposed would result in a relatively high ratio of 1,166 persons per industrial designated acre compared to the significantly lower ratios for other Oahu districts. In fact, it would be the highest ratio of any district. Based upon an analysis of population size and industrial acreage, we believe that the population in the Koolaupoko District would support demand for additional industrial acreage.

It is recognized that the above comparisons between population and land areas are based upon proposed Development Plans for Oahu. However, with respect to the Koolaupoko District, as discussed previously in our survey, only about 95 acres are currently zoned for industrial use in the Koolaupoko District excluding the Kaneohe Sewage Treatment Plant site, the Kapaa Quarry and portions of the Valley of the Temples Cemetery. Thus, even in the event that the proposed Development Plans are not adopted as currently envisioned, there is a very limited amount of industrial land to serve the resident population of the Koolaupoko District.

Several major developments are currently under way in Windward Oahu. In addition to numerous residential developments, such as the Puu Alii condominium apartment project in Kaneohe, Haiku Knolls subdivision in Heeia, the recently completed Windward Estates condominium apartment project situated along Kahekili Highway at Lilipuna Road and other residential projects, the Windward Mall Regional Shopping Center is currently under construction in Kaneohe Town fronting Kamehameha Highway and Lilipuna Road. This shopping center will contain a total gross leasable area of about 600,000 square feet and will include Sears, Penneys and Liberty House as the major anchor tenants. This shopping center is presently anticipated for completion in May 1982.

During the course of this market study we interviewed Mr. Russ Campbell, Manager, Norris, Beggs & Simpson, Ltd., who is the leasing agent for Windward Mall Shopping Center. According to Mr. Campbell, there has been an excellent response to retail space in Windward Mall. To date, about 63 percent of the space has been leased and several other spaces are in various stages of lease negotiations. It is expected that this mall will be substantially leased by the time it opens in May 1982. Mr. Campbell reported that he expects that retailers in this shopping center will require off-site warehousing space for their operations. He also believes that many of the industrial-oriented structures located in the adjacent Kaneohe industrial area will be utilized for more commercial-oriented uses in the coming years after the Windward Mall Shopping Center opens. This potential change in use in the Kaneohe industrial area may create an additional demand for industrial-oriented space in surrounding areas such as the proposed Alexander & Baldwin industrial subdivision in Kahaluu.

Gray, Hong & Associates, Inc.  
October 16, 1981  
Page 5

Interviews with officials of Alexander & Baldwin, Inc. revealed that several entities have made inquiries to Alexander & Baldwin about acquiring industrial sites on their property in Kahaluu. Among the entities that requested the possibility to acquire industrial land from Alexander & Baldwin, Inc. in Kahaluu are Union Oil, First Hawaiian Bank and other industrial/commercial users. These unsolicited inquiries indicate there is a demand for more industrial lots in the subject area of Windward Oahu.

In addition to completing the above-described market study, we were also requested by Gray, Hong & Associates, Inc. to estimate the approximate number of employees that may be expected to eventually work in the proposed Kahaluu industrial subdivision. Until the types of tenants to be located in this subdivision are determined, it is not possible to accurately predict the number of potential employees. However, according to a survey conducted by the Urban Land Institute and included as Exhibit 5, intermediate extensive industrial areas on the mainland have approximately 10 employees per acre of land. Based upon this information, we believe it is reasonable to expect employment in the proposed Kahaluu industrial subdivision to be in the range of about 100 to 150 employees. This estimate is based upon the fact that the proposed Kahaluu industrial subdivision includes a net area of about 11 acres devoted to industrial use and a total gross area of about 14 acres, including land areas within setbacks, devoted to the industrial subdivision.

As discussed previously in this letter, there is a very limited amount of land zoned for industrial use and available for development in Windward Oahu. With the exception of about 20 acres of vacant land in Kahaluu that is zoned for industrial use, there is only a nominal amount of vacant industrial zoned land in the Koolaupoko District (including Kaneohe and Kailua) available for future industrial development. As the Kaneohe area continues to expand, the demand for light industrial oriented space located on sites in or near Kaneohe is expected to increase significantly. The subject property in Kahaluu enjoys a convenient location with respect to Kaneohe Town, about 4 miles to the south. Based upon the investigations and analyses conducted, we believe that there will be a good to excellent demand for the proposed industrial lots to be developed by Alexander & Baldwin, Inc. on their Kahaluu land.

We trust this market study will assist you in your planning for the proposed Kahaluu industrial subdivision. This study assumes that information provided to us by various individuals, government agencies and other entities is reliable. If you have any questions or need further information, please contact us.

Sincerely,  
COWELL & CO., INC.

William J. Dornbush  
Vice President

Jan R. Medusky  
Staff Appraiser

Attachments

## EXHIBIT 1

SUMMARY OF INDUSTRIAL ZONED SITES  
Windward Oahu, State of Hawaii

	<u>Improved Land (Acres)</u>	<u>Vacant Land (Acres)</u>	<u>Total Area (Acres)</u>
WYCO Industrial Park (Kailua)	18.42	0	18.42
Heeia Industrial Park (Kaneohe)	23.11	0	23.11
Kam Hwy. Industrial Sites (Kaneohe)	18.36	0.54	18.90
Industrial Sites North of Kaneohe	12.45	9.42	21.87
Subject Property	<u>0</u>	<u>13±</u> <sup>1/</sup>	<u>13±</u>
	72.34	22.96	95.30

Miscellaneous

Kapaa Quarry (Kailua)	22.236 acres
Kaneohe Sewage Treatment Plant	15.895 acres
Valley of the Temples Cemetary	<u>120.00+</u> acres
	158.00+ acres

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<sup>1/</sup> Approximate; tax map parcels are split zoned.

Source: Cowell & Co., Inc. field survey, October 1981.

**SUMMARY OF INDUSTRIAL ZONED SITES  
Vicinity of Kaneohe, Oahu, State of Hawaii**

Tax Map Key	Land Area (Sq. Ft.) <sup>1/</sup>	Status	Major Tenants/Occupants
<b>Heeia Industrial Area</b>			
4-6-30-03	17,679	Improved	Eggs'n Things, Kaneohe Auto Parts and others
4-6-30-04	17,404	Improved	Love's Bakery
4-6-30-05	14,100	Improved	Koa Interiors and others
4-6-30-06	14,100	Improved	John's Furniture, Suzuki Kaneohe, Bayside Marine Service
4-6-30-07	14,100	Improved	Anna's Kitchen, Consumer Tire, Lawnmower Repair Shop and others
4-6-30-08	14,100	Improved	
4-6-30-09	14,100	Improved	Self Storage, Hale Nani Florist
4-6-30-10	14,100	Improved	Spa Health and Fitness Center
4-6-30-12	28,200	Improved	Goodwill and others
4-6-30-13	14,100	Improved	Garment Factory and others
4-6-30-14	14,100	Improved	Windward Craft Center, Hawaiian Woodworks and others
4-6-30-15	52,221	Improved	Dodge City
4-6-30-19	20,205	Improved	Adair Travel, Heeia Clay Works and others
4-6-30-20	20,205	Improved	Sun Press
4-6-30-21	30,982	Improved	Rainbow Appliances, TV Repair
4-6-30-22	34,591	Improved	Foreign Auto Service, Habilitat and others
4-6-30-27	58,452	Improved	Menehune Closet, All American Skate
4-6-30-29	34,600	Improved	Nanko Fishing Supplies, Ron's Performance Center and others
4-6-30-31	53,283	Improved	Windward Datsun
4-6-30-35	19,846	Improved	Model Home Interiors
4-6-30-36	21,106	Improved	Aloha Glass, Furukawa Body Shop
4-6-30-37	28,884	Improved	Pacific Yacht Repairs, Refrigerator A/C Maintenance and others
4-6-30-40	14,594	Improved	Ahuna's Windward Interiors and others
4-6-30-41	15,683	Improved	Furniture Warehouse
4-6-30-42	13,738	Improved	Bear Machinery, XYZ Glass and Metal and others
4-6-30-43	13,632	Improved	Inamisu Welding
4-6-30-44	14,492	Improved	Windward Cabinets, Kaimuki Plumbing
4-6-30-45	16,258	Improved	GASCO
4-6-30-46	19,343	Improved	GASCO
4-6-31-01	14,100	Improved	United Rent All
4-6-31-02	14,100	Improved	Walls, Windows & Floors, Colony West and others
4-6-31-03	14,100	Improved	Jimmy's Auto Parts
4-6-31-04	14,100	Improved	Ocean Adventures, Prestige Gold & Silver Exchange
4-6-31-12	103,744	Improved	Hatsuka Brothers and others
4-6-31-13	94,103	Improved	City Mill
4-6-31-14	94,371	Improved	Factory Shirts, Masa Heats and Appliances
	1,006,816 (23.11 acres)		

<sup>1/</sup> Land areas based on areas shown on official State Tax Maps.

Note: All parcels in this exhibit are zoned (I-1) Industrial unless otherwise noted.



**SUMMARY OF INDUSTRIAL ZONED SITES**  
**Vicinity of Kaneohe, Oahu, State of Hawaii**

Tax Map Key	Land Area <sup>1/</sup> (Sq. Ft.)	Status	Major Tenants/Occupants
<b>Industrial Sites Along Kamehameha Highway in Kaneohe Town</b>			
4-5-39-14	10,524	Vacant	---
4-5-39-16	13,017	Vacant	---
4-5-39-18	11,783	Bldg. Under Construction <sup>2/</sup>	Windward Liquors
4-5-39-19	11,201	Office Bldg. Under Construction	---
4-5-39-21	10,620	Improved With Older House	Resident
4-5-39-37	51,357	Improved	Snap-in Tools, Island Seed
4-5-39-25	34,892	Improved	Pizza Hut
4-5-39-05	114,668*	Improved	Kaiser Foundation
4-5-39-27	44,433	Improved	Shell Oil
4-5-76-41	73,311	Improved	Flavors of Hawaii
4-5-76-42	27,824	Improved	Koolau Farmers
4-5-76-43	32,660	Improved	Chevron Service Station
4-5-76-44	20,000	Improved	Tire Warehouse
4-5-76-45	52,683	Improved	Action Auto and others
4-5-76-47	74,132	Improved	T. Ida Contractors and others
4-5-76-48	6,752	Improved	Kobashigawa Land Investment Corp.
4-5-76-49	6,400	Improved	Azama's Auto Body
4-5-76-50	7,514	Improved	State Farm Insurance and others
4-5-76-52	6,000	Improved	Ho's Auto Repair
4-5-76-53	7,952	Improved	J & J Sheet Metal
4-5-77-58 (western portion)	80,000+ <hr/>	Improved	Yamashiro Building Supplies and others
	697,723 (16.02 ac.)		
<b>Miscellaneous</b>			
4-5-30-36 (portion)	15.895 ac.	Portion of Kaneohe Sewage Treatment Plant	City & County of Honolulu
4-5-39-01	2.880 ac.	Improved	Na Pali Garden Apartments

<sup>1/</sup> Land areas based on areas shown on official State Tax Maps.

<sup>2/</sup> The site is currently improved with a one-story commercial building. A second structure is under construction.

\*Note: Small portion zoned Residential, R-4.

**SUMMARY OF INDUSTRIAL ZONED SITES**  
**North of Kaneohe Town, Oahu, State of Hawaii**

Tax Map Key	Land Area <sup>1/</sup> (Sq. Ft.)	Status	Major Tenants/Occupants
<b>Industrial Sites North of Kaneohe</b>			
4-7-11-05	10,890	Vacant	---
4-7-11-03	13,591	Vacant	---
4-7-11-09 (portion)	7,000+	Vacant	---
4-7-11-04 (portion)	21,800+	Vacant	---
4-7-14-04*	61,202	Improved w/House	Resident
4-7-14-08*	17,903	Improved w/House	Resident
4-7-14-09*	20,299	Improved w/House	Resident
4-7-14-10*	30,274	Improved w/House	Resident
4-7-14-05*	21,475	Improved	Feed Supply Store
4-7-14-14	7,905	Improved	USA Oil Company
4-7-14-15*	9,768	Improved w/House	Resident
4-7-14-16	5,016	Improved w/House	Resident
4-7-14-17	5,305	Improved w/House	Resident
4-7-14-18	6,215	Vacant	---
4-7-17-02	2,860	Improved w/House	Resident
4-7-17-03	3,330	Improved w/House	Resident
4-7-17-04	2,567	Improved w/House	Resident
4-7-17-05	2,226	Vacant	---
4-7-17-06	734	Vacant	---
4-7-17-07	2,456	Improved w/House	Resident
4-7-17-08*	6,094	Improved w/House	Resident
4-7-17-09	3,400	Improved w/House	Resident
4-7-17-10	2,890	Improved w/House	Resident
4-7-17-11	2,545	Improved w/House	Resident
4-7-17-12	2,410	Vacant	---
4-7-17-13	2,360	Improved w/House	Resident
4-7-17-14	4,491	Improved w/House	Resident
4-7-17-15 (portion)	2,000+	Improved w/House	Resident
4-7-17-19	5,419	Improved w/House	Resident
4-7-17-20	5,030	Improved w/Vacant House	---
4-7-17-21	5,019	Vacant	---
4-7-17-23 (portion)	3,000+	Improved w/House	Resident
4-7-17-24 (portion)	1,000+	Improved w/House	Resident
4-7-17-25	5,249	Improved w/House	Resident
4-7-17-26	5,846	Improved w/House	Resident
4-7-17-27	6,400	Improved w/House	Resident
4-7-17-28	11,279	Improved	The Country Shop
4-7-41-01	5,845	Improved	Homes Consultant Exteriors
4-7-41-02	6,162	Improved	Kahaluu Medical Center
4-7-41-03	5,616	Improved w/House	Resident
4-7-41-04	5,200	Improved w/House	Resident
4-7-41-05	8,352	Improved w/House	Resident
4-7-41-06	5,222	Improved w/House	Resident
4-7-41-07	6,328	Improved w/House	Resident
4-7-41-08	7,825	Improved	Antiques & Objects D'art

<sup>1/</sup> Land areas based on areas shown on official State Tax Maps.

\*Note: Small portions zoned Residential, R-6.

**SUMMARY OF INDUSTRIAL ZONED SITES**  
**North of Kaneohe Town, Oahu, State of Hawaii**

Tax Map Key	Land Area (Sq. Ft.) <sup>1/</sup>	Status	Major Tenants/Occupants
<b>Industrial Sites North of Kaneohe (Continued)</b>			
4-7-41-09	7,190	Improved w/House	Resident
4-7-41-10	6,512	Improved w/House	Resident
4-7-41-11	6,024	Improved w/House	Resident
4-7-41-12 (portion)	4,000+	Improved	Young Sil's Korean Food
4-7-41-13 (portion)	5,227	Vacant	---
4-7-58-01 (portion)	247,000+ <sup>4/</sup>	Vacant	---
4-7-58-03	9,158	Improved	Honda, Outboards, Boat Repair & Welding
4-7-58-04	9,424	Vacant (Bus Storage)	---
4-7-58-05	9,505	Vacant (Bus Storage)	---
4-7-58-06	9,000	Vacant (Bus Storage)	---
4-7-58-07	9,000	Vacant (Bus Storage)	---
4-7-58-08	8,520	Improved	Apartment building
4-7-58-09	9,000	Bldg. Under Construction	---
4-7-58-10	9,000	Improved	Steel frame storage shed
4-7-58-11	9,000	Improved	Concrete tile storage structure
4-7-12-13 (portion)	109,000+	Vacant	Proposed park
4-7-13-15	12,000+	Electric Substation	Hawaiian Electric Company
4-7-13-14	16,901	Waihee Booster Station	City & County of Honolulu
4-7-13-18	79,366	Improved	Hawaiian Telephone
	952,565 (21.87 acres)		
<b>Subject Property<sup>3/</sup></b>			
4-7-13-01 <sup>2/</sup>	5,304 ac.	Vacant	---
4-7-13-12 <sup>2/</sup>	1,657 ac.	Vacant	---
4-7-13-24 <sup>2/</sup>	8,356 ac. <sup>4/</sup>	Vacant	---
	15,317 ac. <sup>2/</sup>		
<b>Miscellaneous</b>			
4-7-51-02 (portion) <sup>5/</sup>	120+ ac. <sup>5/</sup>	Cemetery	Valley of the Temples

- <sup>1/</sup> Land areas based on areas shown on official State Tax Maps.  
<sup>2/</sup> Strip of land along Kamehameha Highway zoned R-6, Residential.  
<sup>3/</sup> Small portions of TMK 4-7-13-11 and 16 are also zoned Industrial, I-1.  
<sup>4/</sup> Approximate area zoned Industrial, I-1.  
<sup>5/</sup> Portions zoned I-1 and I-2.

SUMMARY OF INDUSTRIAL ZONED SITES  
Vicinity of Kailua, Oahu, State of Hawaii

Tax Map Key	Land Area (Sq. Ft.) <sup>1/</sup>	Status	Major Tenants/Occupants
<b>Wyco Industrial Park</b>			
4-2-38-01	30,600	Improved	Hawaiian Telephone
4-2-38-02	31,287	Improved	HonFed, Avco Financial, various others
4-2-38-04	19,732	Improved	Kailua Auto Parts
4-2-38-05	45,000	Improved	The Associates Finance, Ole Mexican Restaurant, various others
4-2-38-08	15,000	Improved	C & P Hardware and Lumber
4-2-38-09	15,000	Improved	Island Steel & Welding
4-2-38-10	15,257	Improved	Care Animal Clinic, Especially For You, various others
4-2-38-47	7,519	Improved	Correa & Son Plumbing
4-2-38-46	7,738	Improved	Midas
4-2-38-48	15,000	Improved	Island Steel & Welding
4-2-38-49	15,000	Improved	C & P Home Center
4-2-38-50	9,000	Improved	Kailua Fender Shop, Harry's Antiques
4-2-38-51	18,000	Improved	Dave's German Car, Windsurfing Shop, various others
4-2-38-52	18,000	Improved	Menehune Closet, Windward Wholesale Meats, various others
4-2-38-54	9,500	Parking Lot	---
4-2-38-53	16,465	Improved	State Farm Insurance, space available for lease
4-2-38-55	9,874	Improved	Kailua Auto Service, Carpets of Kailua, various others
4-2-38-56	12,835	Improved	Barbershop, Abbey's Carpet, various others
4-2-38-57	9,530	Improved	Kailua Transmission Service, Old Volks Home, various others
4-2-38-58	9,295	Improved	
4-2-38-59	8,760	Improved	Franklin Press, Upholstery shop
4-2-38-60	8,760	Improved	Vacant 2-story office building
4-2-38-23*	100,475	Improved	Enjay's and Pay'N Save
4-2-38-22	87,157	Improved	Kailua Center, Appliance Parts Co., Alexander's Pizza, various others
4-2-38-21*	6,168	Improved	
4-2-38-20*	72,653	Improved	Pali Lanes, Pali Inn, Parking lot
4-2-38-34	112,680	Parking Lot	Parking for Kailua Shopping Center
4-2-38-37	7,000	Parking Lot	
4-2-38-40	6,182	Parking Lot	
4-2-38-42	17,807	Parking Lot	
4-2-38-39	7,500	Parking Lot	
4-2-38-38	8,500	Parking Lot	Mr. Sub, Hawaiian Island Creations, various others
4-2-38-14*	14,372	Improved	
4-2-38-15*	14,520	Improved	Alfred's Pool Supplies
	802,166 (18.42 acres)		
<b>Miscellaneous</b>			
4-2-15-08	22.236 acres	Kapaa Quarry	Ameron HC&D

<sup>1/</sup> Land areas based on areas shown on official State Tax Maps.

\*Note: Portions of these lots are zoned Residential, R-6.

## EXHIBIT 3

INDUSTRIAL LAND SUPPLY  
Island of Oahu

<u>Development Plan Area</u>	<u>Based Upon 1978 Survey (Acres)</u>			<u>Total</u>
	<u>In-Use</u>	<u>Usable</u>	<u>Misused</u>	
Primary Urban Center	509.39	177.92	375.22	1,062.53
Ewa	669.12	726.87	110.97	1,506.96
Central Oahu	53.55	74.01	41.16	168.72
East Honolulu	0	0	0	0
Koolaupoko	29.70	1.40	28.42	59.52 <sup>1/</sup>
Koolauloa	0	0	0	0
North Shore	0	4.39	0	4.39
Waianae	25.00	0	7.60	32.60
Non-Primary Urban Center	<u>777.37</u>	<u>806.67</u>	<u>188.15</u>	<u>1,772.19</u>
TOTALS	1,286.76	984.59	563.37	2,834.72

<sup>1/</sup> Based upon our field survey, we estimated that the total acreage designated for industrial use on the Koolaupoko Development Plan approximates 60 acres, excluding the Kapaa Quarry site containing about 22 acres.

Source: Table 51, Development Plan Land Use Analysis, Department of General Planning, City & County of Honolulu, April 1980.

Note: The land areas in the above table do not correspond with land areas shown in Appendix B, Development Plan Use Analysis, Department of General Planning, City & County of Honolulu, April 1980.

**SUMMARY AND COMPARISON OF INDUSTRIAL LAND AREAS**  
Covering the Development Plan Districts, Island of Oahu

District	1980 Census Resident Population <u>1/</u>	Industrial Land Supply Per 1978 Survey (Acres) <u>2/</u>	Industrial Land Supply Based Upon Proposed Development Plans (Acres) <u>3/</u>	Industrial Zoned Land in District (Acres) <u>3/</u>
Primary Urban Center	418,190	1,062.53	1,773.62	3,237.02
Ewa	36,255	1,506.96	1,752.86	2,126.65
Central Oahu	99,939	168.72	311.07	317.81
East Honolulu	42,263	0	0	0
Koolaupoko (Subject)	109,373	59.52	93.79	375.00 <u>4/</u>
Koolauloa	14,195	0	0	0
North Shore	9,849	4.39	36.29	0
Waianae	32,810	32.60	34.20	66.60
<b>TOTALS</b>	<b>762,874</b>	<b>2,834.72</b>	<b>4,001.84</b>	<b>6,123.08</b>

1/ Statistical Report 143, March 18, 1981, The Population of Hawaii 1980, Final Census Results, Department of Planning and Economic Development, State of Hawaii.

2/ Per Table 51, Development Plan Land Use Analysis, Department of General Planning, City and County of Honolulu, April 1980.

3/ Per Appendix B, Development Plan Land Use Analysis, Department of General Planning, City and County of Honolulu, April 1980.

4/ With respect to Koolaupoko, the amount of industrial zoned land (375 acres) is substantially distorted due to the fact that about 120 acres of industrial zoned land in the Valley of the Temples Cemetery is included. Further, about 46 acres of industrial zoned land in Ahuimanu Valley was rezoned to residential in 1980. Our recent survey (October 1981) revealed that there are about 95 acres of industrial zoned land in Koolaupoko, excluding the Kapaa Quarry, the Kaneohe Sewage Treatment Plant and the Valley of the Temples Cemetery.

5-4

**INDUSTRIAL EMPLOYEE DENSITIES AND PROJECTED DEMAND  
FOR INDUSTRIAL LAND METROPOLITAN AREA (000)**

Industry Use Group	Type of Major Industry Group	1970 Annual Employment	Employees Per Gross Acre—1970	1980 Annual Employment	Employees Per Gross Acre—1980	Decade Employment Increase	Additional Demand for Industrial Land	Percent Distribution
<b>1 — Intensive</b>		88,663	26*	87,889	24	19,226	801	14.06
	Electrical Equipment and Supplies	19,178						
	Transportation Equipment	17,992						
	Instruments and Related Products	6,631						
	Apparel and Other Textile Products	13,659						
	Printing and Publishing	11,203						
<b>2 — Intermediate Extensive</b>		112,468	12*	137,211	10	24,743	2,474	43.43
	Ordinance and Accessories	2,420						
	Lumber and Wood Products	3,612						
	Furniture and Fixtures	4,657						
	Primary Metal Industries	13,165						
	Fabricated Metal Products	13,800						
	Machinery, Except Electrical	19,823						
	Miscellaneous Manufacturing Industries	4,267						
	Food and Kindred Products	17,803						
	Textile Mill Products	9,566						
	Paper and Allied Products	7,060						
	Chemicals and Allied Products	10,495						
	Rubber and Plastic Products	5,800						
<b>3 — Extensive</b>		161,395	6*	180,762	8	19,367	2,421	42.50
	Stone, Clay and Glass Products	6,413						
	Tobacco Products	392						
	Petroleum and Coal Products	2,077						
	Leather and Leather Products	3,477						
	Wholesale Trade	149,036						
	<b>Totals</b>	342,526		405,862		63,336	5,696	100.00

\* The net acre density has been adjusted to a gross acre density different from that indicated in the graph.

Source: Industrial Development Handbook, 1975, Page 168, Urban Land Institute.

QUALIFICATIONS OF WILLIAM J. DORNBUSH  
REAL ESTATE CONSULTANT AND APPRAISER

Vice President and Senior Appraiser, Cowell & Co., Inc., Real Estate Consultants  
1414 Hawaii Building, 745 Fort Street, Honolulu, Hawaii

Licensed Real Estate Broker, State of Hawaii  
M.A.I. Candidate, American Institute of Real Estate Appraisers  
Associate Member, Society of Real Estate Appraisers

PREVIOUS PROFESSIONAL BACKGROUND

Senior Appraiser (1971-1975), Don R. Cowell & Associates, Urban Land Economists  
Project Manager (residential condominium and neighbor island resort development)  
during 1974 and 1975 at Blackfield Hawaii Corporation (the parent company of  
Don R. Cowell & Associates)

EDUCATION

B.A., University of Illinois, 1968 (Finance, Major; Mathematics, Minor)  
Real Estate Courses: Property Valuation, Real Estate Development and Finance,  
Urban Land Problems.

SPECIAL COURSES

Investment Analysis Seminar presented by the American Institute of Real Estate  
Appraisers, 1973, Honolulu. Dr. James A. Graaskamp of the University of  
Wisconsin served as instructor.

American Institute of Real Estate Appraisers Course VI, Investment Analysis  
(Ellwood Course), 1975, Honolulu.

Construction Management Seminar, presented by AMR International, Inc., 1974,  
San Francisco.

GRI Course VI, Investment Real Estate, Small Business Management Program,  
University of Hawaii, 1975.

FAA Rated Commercial Pilot.

MILITARY

U.S. Navy Reserve, 1969-1971. Graduated from Aviation Officer Candidate School,  
Pensacola, Florida. Designated Naval Flight Officer.

PROFESSIONAL EXPERIENCE

Engaged in real estate valuation since 1971 including ten months at the Guam  
office of Don R. Cowell & Associates.

State of Hawaii assignments include appraisals, feasibility analyses, market  
studies and counseling regarding office buildings, industrial properties,  
residential condominiums, restaurants, shopping centers, hotels, resort areas  
and large scale land developments. Geographical areas covered include the  
Islands of Oahu, Maui, Hawaii, Kauai and Lanai.

Territory of Guam assignments include the valuation of private land parcels for  
tax assessment purposes on the Island of Guam for the Department of Revenue  
and Taxation, Government of Guam; valuation studies regarding resort hotels,  
industrial properties, rental apartments, condominium apartments, commercial  
developments including office buildings and restaurants, and residential  
tract projects.

Other experience includes assignments and research in American Samoa, Fiji,  
Ponape, Truk and the Island of Saipan, Marianas Islands.



QUALIFICATIONS OF JAN R. MEDUSKY  
STAFF APPRAISER

Staff Appraiser, Cowell & Co., Inc., Real Estate Consultants  
1414 Hawaii Building, 745 Fort Street, Honolulu, Hawaii

Licensed Real Estate Salesperson, State of Hawaii

M.A.I. Candidate, American Institute of Real Estate Appraisers

EDUCATION

Culver Military Academy, Culver, Indiana. Graduated with honors, 1964-1968.

Bachelor of Science Degree, U.S. Military Academy, West Point, New York,  
1968-1972.

University of Hawaii, Graduate courses in Business and Economics, 1975-1976.

Master of Business Administration Degree, Chaminade University of Honolulu,  
1980.

SPECIAL COURSES

Graduate Real Estate Institute, Courses I and II, Honolulu, 1979.

Stapleton School of Real Estate, Sales Licensing Course, Honolulu, 1979.

Credit for American Institute of Real Estate Appraisers Course 1A - Real Estate  
Appraisal Principles and Course 1B - Basic Valuation Procedures, 1981.

MILITARY

Captain, U.S. Army, 1972-1978. Held various positions including Commander, Air  
Defense Artillery Battery and Special Staff Officer, 25th Infantry Division  
General Staff, Schofield Barracks, Hawaii.

EXPERIENCE

Engaged in real estate consultation and valuation with Cowell & Co., Inc.  
Geographical areas covered include the four counties of the State of Hawaii  
and the Territory of Guam.

APPENDIX J

KAHALUU INDUSTRIAL PROJECT  
AGRICULTURAL FEASIBILITY STUDY

DR. FRANK S. SCOTT, JR.  
Agricultural Economist  
275 Kaelepuku Drive  
Kailua, Hawaii 96734

December 3, 1981

Cowell & Co., Inc.  
Real Estate Consultants  
1414 Hawaii Building  
745 Fort Street  
Honolulu, Hawaii 96813

Attention: Mr. William J. Dornbush  
Vice President

Gentlemen:

Subject: Agricultural Feasibility, Kahaluu Industrial Project,  
Tax Map Key 4-7-13-01, 02, 10, 11, 12, 16 and 24,  
Koolaupoko District, Island of Oahu, State of Hawaii

This report investigates the feasibility of agricultural production on the 26.3 acres of land constituting the subject parcel. The land is owned by Alexander & Baldwin, Inc.

#### Soil Classifications

Most of the soils in the 21 acres mauka of Kamehameha Highway are classified by the U.S. Soil Conservation Service as Tropaquepts (TR). A very small area at the southeast corner of the property consists of Lolekaa silty clay (LoE), which has been extended by the addition of fill. The 5-acre parcel on the makai side of the highway is classified as Fill Land. Descriptions and soil capability classifications of the three soil types are as follows:

#### Tropaquepts (TR)

This series consists of nearly level flood plains. The topsoil is about 10 inches thick and consists of dark gray, soft, mucky silt loam. The subsoil, which is 5 to 10 inches thick, consists of firm to compact silty clay loam mottled with gray, yellow and brown. The mottled clay overlies friable alluvium. The soils are always wet and workability is poor under natural conditions. Low permeability and a high water table make drainage for agricultural production extremely difficult. The soils can be utilized only for crops that grow in water and have previously been used for taro, rice and watercress. The capability classification is IV w, with or without irrigation.

#### Lolekaa Silty Clay, 25 to 40% Slopes (LoE)

The small area of land in this series consists of a fan with steep slopes. The topsoil consists of dark brown silty clay about 10 inches thick. The subsoil is 46 to more than 70 inches thick, with the upper part consisting of dark brown silty clay with subangular blocky structure and the lower part consisting of dark yellowish-brown loam, also with subangular blocky structure. The substratum is strongly weathered gravel. The topsoil is strongly acid and the subsoil is extremely acid. Permeability is moderate, runoff is medium to rapid and the erosion hazard is moderate to severe. Workability is difficult because of the slope. The capability classification is VI e, and the soil is generally used only for pasture.

#### Fill Land, Mixed (FL)

This consists of land filled with material dredged from the ocean or garbage or other material hauled in from other sources. These areas are not classified according to capability. The fill land at the site is wooded with mangrove and hau trees and is subject to flooding, both from freshwater overflow and from the ocean.

The University of Hawaii Land Study Bureau gives most of the project area a low capability classification of D.

#### Agricultural Feasibility Under Existing Conditions

The approximately 19 acres mauka of the highway classified as Tropaquepts are under water much of the time and cannot be used for crop production, except for pasture and crops which grow in water such as rice, watercress and taro. The 5-acre segment of fill land makai of the highway does not have topsoil usable for agricultural production and is subject to flooding, both from runoff and from the ocean. Thus it is unusable for any type of agricultural production.

#### Rice

Paddy rice production in the mauka area would be highly labor-intensive and uneconomic under current labor costs, before considering the cost of land. Even under the best of conditions, rice yields a low net income per acre. For several decades, Hawaii has been unable to compete in rice production with areas of low labor costs and/or conditions which permit mechanization.

### Watercress

The market for watercress is extremely limited and the entire Oahu market is being supplied by the output from a few acres. Runoff and drainage conditions in the project area would pose serious production problems even if an adequate market existed.

### Taro

Although taro could be grown in the project area, there are several potential areas along non-polluted streams between Kaneohe and Hauula which are better adapted to taro production than mauka lands in the subject parcel. Even these areas have serious disease problems, which are transmitted from one taro patch to another by surface irrigation water. An excessive requirement of 77,000 gallons of water per acre per day is required to keep the water temperature under 78° for partial control of pythium (fungus) disease.

Recent budget analyses by the writer indicate a very low net return for taro of about \$900 per acre annually, not including water and land costs. This poses two serious limitations for the project area. First, a large taro farm of not less than 20 acres would be required to provide an adequate family living. This would constitute the entire acreage of the project mauka of the highway. This leads to the second and most critical limitation of unreasonable water requirements of 1,540,000 gallons of water per day at a rate of 77,000 gallons per acre per day for 20 acres. A very costly canal and canal maintenance system could reduce the total water requirement by an unspecified amount through re-use of surface irrigation water by converting it from one patch to another.

The above conditions lead to the conclusion that taro production would not be feasible for the following reasons. Taro production in this area would not be able to compete costwise with production under better ecological conditions in other areas. Fungus disease would be difficult or impossible to control. The crop makes very inefficient use of irrigation water and this is compounded by the fact that adequate irrigation water is not available. Net returns in taro production are low, even without considering land and water costs and would undoubtedly be negative in this project area after imposing realistic land and water costs.

### Pasture

The 21-acre mauka parcel of the project area is currently being used to pasture about 50 head of cattle, which are also provided supplemental feed consisting of cull pineapple. The owner of the cattle reportedly pays \$200 lease rent annually for the 21 acres or \$9.52 per acre.

Cattle grazing on marginal land, such as in the project area, is an extensive operation and yields a low net return per acre. A detailed budget analysis has not been made of the existing cattle grazing operation, but based on current data from other cattle grazing operations on Oahu, it is estimated that the net value for grazing would not exceed \$150 per acre annually, even at a lease cost of less than \$10 per acre. Thus, the cattle grazing operation constitutes little more than a holding procedure until a greater use value for the land can be realized. Use of the land for cattle grazing is not only uneconomic for the land owners, but constitutes a source of pollution for Kaneohe Bay.

### Agricultural Feasibility Under Site Improvement

Adequate drainage and a source of disease-free piped water are essential to the production of all crops in the project area other than crops which are water tolerant. Intensive crops for which sales potentials exist and which would be adaptable to the project area under conditions of adequate drainage are bananas, some truck crops and potted flowers and foliage.

Gray, Hong & Associates, Inc. have determined that adequate drainage for agriculture would require 2.0+ feet of fill over the entire 21-acre area mauka of the highway (except for the small area of Lolekaa silty clay) plus appropriate drainage swales in order to make the land feasible for crop production (see attached). The fill is necessary because of the low permeability of the existing soils and because of the drainage barrier imposed by Kamehameha Highway. This improvement, plus an unpaved access road, would cost an estimated \$533,000 or \$25,380 per acre. Water poses another limitation. Crop production would require an estimated 5,000 gallons per acre per day or 105,000 gallons per acre per day for the 21 acres. Unless sufficient water can be obtained through the pumping of North Waihee Stream water into a system for sprinkler irrigation, it will be necessary to apply for City and County water at an agricultural rate of 69 cents per 1,000 gallons in excess of 13,000 gallons. Assuming that

supplemental irrigation would be required for a 6-month period each year, water cost for most crops would amount to \$628 per acre annually.

Even with proper drainage, the soil is of poor quality for the production of crops such as bananas and vegetables which meet all agricultural feasibility criteria other than ecology, with a U.S. Soil Conservation Service classification of IV and a University of Hawaii overall rating of D.

Shadehouse production of potted flowers and foliage plants would require additional fill land as a foundation, but would not be limited by soil conditions since the plants would be grown in medium obtained elsewhere. Proximity to the ocean would pose a problem of salt air from the prevailing winds. This area would thus be less desirable for potted flower and foliage production than certain other areas on Oahu and fixed production costs would be higher because of the required fill.

#### Conclusions

The project site is infeasible for agricultural production, both with respect to ecology and economic feasibility.

Sincerely,

*Frank S. Scott, Jr.*  
Frank S. Scott, Jr.  
Agricultural Economist

#### Attachments:

Kahaluu Industrial Project -- Agricultural Feasibility,  
Gray, Hong & Associates, Inc., November 30, 1981.

Curriculum Vitae -- Dr. Frank S. Scott, Jr.

GRAY, HONG & ASSOCIATES, INC.  
CONSULTING ENGINEERS

November 30, 1981

BRIAN L. GRAY, PE  
DANIEL S.C. HONG, PE  
DAVID B. BILLS, PE  
RAYMOND M. SANTO, PE  
GARY K. WATANABE, PE

Dr. Frank S. Scott, Jr.  
c/o Cowell & Co., Inc.  
Hawaii Building  
745 Fort Street Mall, Suite 1414  
Honolulu, Hawaii 96813

SUBJECT: Agricultural Feasibility  
Alexander & Baldwin, Inc. Property  
Kahaluu Industrial Project

Dear Dr. Scott:

We are forwarding the following information regarding improvements to the property which are considered necessary to enhance agricultural use. The following cost estimates are based on the following assumptions:

1. Approximately 2.0± feet of fill is required over the 21.0± acre site mauka of Kamehameha Highway to create usable agricultural land with surface swales for drainage.
2. One main access road connecting to Kamehameha Highway can be created which will provide access to four (4) 5.0± acre agricultural lots. This roadway would essentially be minimally improved (unpaved - crushed coral or equivalent) and elevated approximately 1-foot above the finished grade. The cost of the roadway would be incidental to the mass grading.
3. Water for irrigation purposes, if not available from existing sources, i.e. the inactive suwai or North Waihee Stream, could be supplied via connection to the Board of Water Supply water transmission system. Based on an average water requirement of 4,000 gallons per acre applied over an eight hour day, the average daily water requirement would be 84,000 gpd and the flow rate would be 175 gpm. One 4-inch main running in the shoulder of the access road would be required to provide flow. One 3-inch water meter would be necessary at the connection to the Board's system and one 1-1/2-inch private individual meter would be necessary at each agricultural plot.

Should you have any questions, please contact our office.

Very truly yours,

Gray, Hong & Associates, Inc.

  
\_\_\_\_\_  
Brian L. Gray

DB:mp  
988



AGRICULTURAL DEVELOPMENT  
COST ESTIMATE

<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
Embankment/Drainage (Including fill and unpaved road)	68,000 C.Y.	\$ 6.50/C.Y.	\$ 442,000.00
4-inch Transmission Main	500 L.F.	30.00/L.F.	15,000.00
3-inch Water Meter	1 each	5,000.00/each	5,000.00
1-1/2-inch Private Meter	4 each	500.00/each	<u>2,000.00</u>
		SUBTOTAL:	\$ 464,000.00
Miscellaneous and Contingency at 15%±			69,000.00
		TOTAL:	\$ 533,000.00

## CURRICULUM VITAE

Frank S. Scott, Jr.

Business Address: Department of Agricultural and Resource Economics, University of Hawaii, Bilger 210, 2545 The Mall, Honolulu, Hawaii 96822.  
Telephone: (808) 948-8420

Home Address: 275 Kaelepuku Drive, Kailua, Hawaii, 96734

Citizenship: USA      Date of Birth: 3/5/21

### Education

- University of Illinois, Urbana, 1948-51, Ph.D. 1953.  
Major: Resource Economics
- University of Missouri, Columbia, 1946-47, M.A. 1947.  
Major: Marketing of Agricultural Products
- Oregon State University, Corvallis, 1942-43, B.S. 1944.  
Major: Animal Science, Minor: Agricultural Economics
- University of Wyoming, Laramie, 1939-41.  
Major: Animal Science

### Language Proficiency

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>	<u>Understanding</u>
English	Excellent	Excellent	Excellent	Excellent
Spanish	Good	Good	Good	Good
Portuguese	--	Fair	--	Fair
French	--	Fair	Fair	Fair
German	--	Fair	Fair	Fair

### Special Areas of Competence

1. Market potentials and market development
2. Feasibility of resource development
3. Agricultural economic development
4. Economic feasibility of tropical crops

### Employment, University

Professor, Department of Agricultural and Resource Economics, University of Hawaii, 1959 to date (Chairman of Department, 1960, 1964, 1971-1980)  
(Chairman of Graduate Field in Agricultural Economics, 1959-60, 1962-67, 1970 to date).

Associate Professor, Department of Agricultural and Resource Economics, University of Hawaii, 1954-59.

Assistant Professor, Department of Agricultural Economics, University of Nevada, Reno, 1951-54.

Employment, University (continued)

Research Assistant, Department of Agricultural Economics, University of Illinois, 1950-51.

Assistant Professor of Agricultural Economics, Stephen F. Austin State University, 1948-50.

Foreign Assignments

Economist, Taleghani-Doftary Engineering Company, Tehran, Iran (Economic Feasibility, Mond-Shespir Reclamation Project), February-March, 1978.

Economist, FAO, Turrialba, Costa Rica (Economic Feasibility of a Macadamia Nut Industry in Costa Rica), June-August, 1975.

Research Economist, Hawaiian Agronomics, Moghan Regional Economic Development Project, Iran, February-May, 1971.

Marketing Advisor to Argentina, Texas A & M University-AID, Buenos Aires (Advisor to Instituto Nacional Technologica Agropecuaria in Buenos Aires and at provincial institutes, taught graduate courses in marketing and chaired M.S. committees as a member of the graduate faculty of Texas A & M University), September, 1967 - December, 1969.

Research Economist, Hawaiian Agronomics-AID (Mechanization and Modernization of the Sugar Industry in N.E. Brazil, Acting Chief of Party and co-author of report with Ernest Smith), November, 1965 - May, 1966.

Marketing Advisor to Argentina, FAO (taught graduate courses in marketing, advised researchers and established research and extension plans in marketing for 10 regional stations of Instituto Nacional Technologica Agropecuaria), December 1960-January, 1962.

Consulting Assignments

Agricultural Economic Feasibility for Kaluanui Ventures, Oahu, Hawaii, report submitted November, 1980.

Crop Feasibility - Mokuleia Homesteads, reports submitted in March and April, 1980.

Agricultural Feasibility and Environmental Impact - Waiahole Valley Agricultural Park, MSE Pacific, Honolulu, report submitted May, 1980.

Agricultural Feasibility and Environmental Impact, Keahole Agricultural Park, MSE Pacific, Honolulu, report submitted July, 1977.

Agricultural Feasibility, Waiahole Valley, Architects Hawaii, Honolulu, report submitted October, 1977.

Agricultural Economic Potential-Kona, Hawaii, Donald Wolbrink and Associates,  
Honolulu, report submitted in October, 1974.

Economic Feasibility - Honomalino Macadamia Nut Project (with Edmund  
Barnettler), Associated Economic Research, Honolulu, 1964.

Present Base Salary (at University of Hawaii)

\$43,452.00

Publications

See attached list.

References

Will be provided upon request.

FRANK S. SCOTT, JR.

Publications:

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