Waialee Livestock Research Center

UNIVERSITY OF HAWAII
COLLEGE OF TROPICAL AGRICULTURE & HUMAN RESOURCES

ENVIRONMENTAL IMPACT STATEMENT

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING & GENERAL SERVICES

ENVIRONMENTAL IMPACT STATEMENT

FOR

WAIALEE LIVESTOCK RESEARCH CENTER

Ko'olauloa, Island of O'ahu, Hawaii

Prepared for

STATE OF HAWAII

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

HIDEO MURAKAMI COMPTROLLER

JUL 24 1980
DATE

Prepared by

H. MOGI PLANNING AND RESEARCH, INC.

July 1980

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GLOSSARY

CES	County Extension Service
CTAHR	College of Tropical Agriculture and Human Resources
EIS	Environmental Impact Statement
Expansion	Enlarging the area of the Waialee Livestock Research Center (WLRC) by increasing its acreage to include adjacent lands around the existing site.
HAES	Hawaii Agricultural Experiment Stations
HITAHR	Hawaii Institute of Tropical Agriculture and Human Resources
Kane Stone	(Pohaku O Kane) Stone that is an embodiment of the Hawaiian god Kane Kawaiola (Kane of the Waters of Life). Used by taro planters as a place of worship to Kane for the waters of Life and his continued beneficence.
Konohiki	Headman of an ahupuaa land division under the chief.
Kuleana	A small piece of property, as within an ahupuaa, which is a larger land division under the old Hawaiian system of land classification.
Makai	Directional word meaning towards the sea or on the ocean side.
Mauka	Directional word meaning towards the mountain or on the mountain side.
MGD	Million gallons per day.
Program Units	Research divisions of the Department of Animal Science utilizing the existing or planned facilities of the WLRC.
Proposed Action	The redevelopment and expansion of the WLRC to upgrade its facilities and increase its research capability.
Redevelopment	Upgrading the existing WLRC facilities and constructing new facilities to enable more efficient and continued use of the Center.

GLOSSARY (cont.)

Renovation	Improving and upgrading existing facilities to fit the facilities to current needs.
Site	The area bounded by the existing WLRC boundaries plus areas considered for possible expansion of the center.
SMA	Special Management Area
UBC	Uniform Building Code
WLRC	Waialee Livestock Research Center
UH	University of Hawaii
UHM	University of Hawaii Manoa Campus

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SUMMARY

PROPOSED ACTION

The University of Hawaii is proposing the redevelopment and expansion of its Waialee Livestock Research Center (WLRC). The Center is the College's only experimental station covering the research needs of Hawaii's livestock industries. The proposed action will involve the renovation of existing facilities, construction of new facilities, and expansion into and use of marginal vacant and private lands around the existing site. Included in the expansion will be a new aquaculture unit with all attendant facilities; ponds, laboratories, and offices. A separate health management unit will also be added to the existing program units. The result of the proposed action will be an improved and expanded research facility capable of basic and applied research to promote the State's diversified agricultural industries and tropical agriculture in general.

DESCRIPTION OF SITE

The WLRC is located in Oahu's Koolauloa district along the island's north shore. The site includes a narrow band of land between the sea cliffs of the Koolau range and the shoreline. The makai section of the site is mainly coastal plain while the mauka portion is more talus slopes and cliff areas. Much of the makai area is within the Special Management Area (SMA). The land uses and zoning is predominantly agriculture. Major developments in the area are the proposed expansion of the Kuilima Resort complex and the establishment of the State's Kahuku Agricultural Park. Aquaculture is a growing industry in the region. The site is located on the edge of the Koolau dike zone and water resources are plentiful. Kalou Fishpond which is located on the site was formerly listed in the State register of Historic Places. Adjacent to the WLRC is Crawford Convalescent Home, a private medium care facility for the aged. Several kuleana and private residences are scattered within the site. Climate is fairly uniform throughout the year and is characteristic of much of the north shore. The site is accessed by Kamehameha Highway which divides the site into mauka and makai sections. Traveling time from the Manoa Campus is about 70 minutes.

MAJOR IMPACTS AND MITIGATION MEASURES

Short term impacts will be related to construction activity which will result in temporary traffic disruption, noise, dust and some soil erosion. Mitigating measures will be implemented to minimize the adverse construction impacts.

Long term impacts will be in a variety of areas. The expanded facility will result in appropriate drainage and clearing of lands in and around the present WLRC boundaries. This impact will be largely beneficial. Drainage will be altered with the clearing and construction of access roads, and swales. The implementation of improved drainage systems for the boggy makai lands will enable continuous use of these lands and also eliminate breeding areas for

mosquitoes and other vectors detrimental to public health. The addition of the aquaculture units will expand the research capabilities of the WLRC and increase the water use on the site. Ultimate designs for the ponds call for a demand capacity of approximately one (1) million gallons per day (MGD). The most likely means of meeting this increased water demand will be the uncapping of existing old wells or the drilling of a new well.

The proposed action will improve the health and well-being of the public. Besides the benefits of draining the makai boggy lands, upgrading facilities will improve sanitation on the site. The addition of an improved waste disposal system will eliminate the potential problems associated with seepage pit failures. There may be condemnation of private lands and leases in the later phases of the proposed action. Finally, the visual character of the site will be altered. Vacant lands presently covered with wild grasses, bushes, and koa haole will be replaced by aquaculture ponds and pastures. Old buildings on the site will be renovated or torn down and new facilities constructed.

Labor, fuel, materials, State lands and funds will be utilized in the implementation of the proposed action.

ALTERNATIVES INCLUDING PROPOSED ACTION

Alternatives included: no action, relocation and redevelopment. The no-action alternative was rejected, because it would not meet the College of Tropical Agriculture and Human Resources' goals and objectives and the State's Commitment to support aquaculture. Also, the no-action alternative would result in the continued deterioration of facilities that are already old and inadequate and in a decrease in the research capability of the College.

The relocation alternative was rejected for the following reasons: (a) the high cost of acquiring and developing a new site, (b) the time delays associated with the acquisition and development of a new site, and (c) operational problems due to facilities being split between two different locations during the interim when the existing facilities are being phased out and new facilities constructed.

Within the redevelopment option there are two major alternatives; redevelopment without expansion and redevelopment with expansion. Redevelopment without expansion creates severe design constraints and would have resulted in many trade-offs for space as the addition of the aquaculture and health management units would force reductions and constraints on the existing programs. The redevelopment with expansion alternative best suits the purposes of the College by allowing upgrading of existing program units and facilities and the inclusion of new programs and facilities resulting in an improved and expanded research capability for the WLRC.

The expanded uses of the site will be consistent with the prevailing land uses in the area and conform to the zoning for the area.

The proposed action is consistent with many of the goals and intents of the Hawaii State Plan and the City and County of Honolulu's General Plan. The increased research capability of the WLRC will assist in the continued development of diversified agriculture in the State. The addition of the aquaculture

unit will be helpful to this rapidly growing industry and a stronger diversified agriculture sector means a wider base for the State's economy. The expanded research facilitiy will aid the College of Tropical Agriculture in its goal of becoming a regional research center for tropical agriculture by increasing its capability in this field and enchancing its prestige.

ENVIRONMENTAL IMPACT STATEMENT

for

Waialee Livestock Research Center

I. Introduction

The Waialee Livestock Research Center (WLRC) is part of the University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR) and has served as the college's primary animal research facility for over 20 years. Located in the Waialee area of Oahu's Koolauloa District, the WLRC occupies 135 acres between the cliffs of the Koolau Range and the Pacific Ocean, (See Figures 1 and 2).

The WLRC is one of 15 branch stations located throughout the State that compose the Hawaii Agricultural Experiment Stations (HAES), the research arm of the College of Tropical Agriculture. The WLRC is one of three stations on Oahu and is the only one in the State covering the research needs of Hawaii's livestock industries.

The primary function of the facility is basic and applied research in the fields of nutrition, physiology, breeding, and genetics as related to dairy, beef, swine and poultry. A major objective is to aid the dairy, beef, swine and poultry industries in efficiently producing quality livestock products with high consumer satisfaction.

The Waialee Livestock Research Center is also used for the teaching and training of students in the Department of Animal Science program. A summer training program is conducted at the center annually to give students practical experience in the management of the various species of livestock and to observe and participate in research "trials" that are underway on problems confronting the industry.

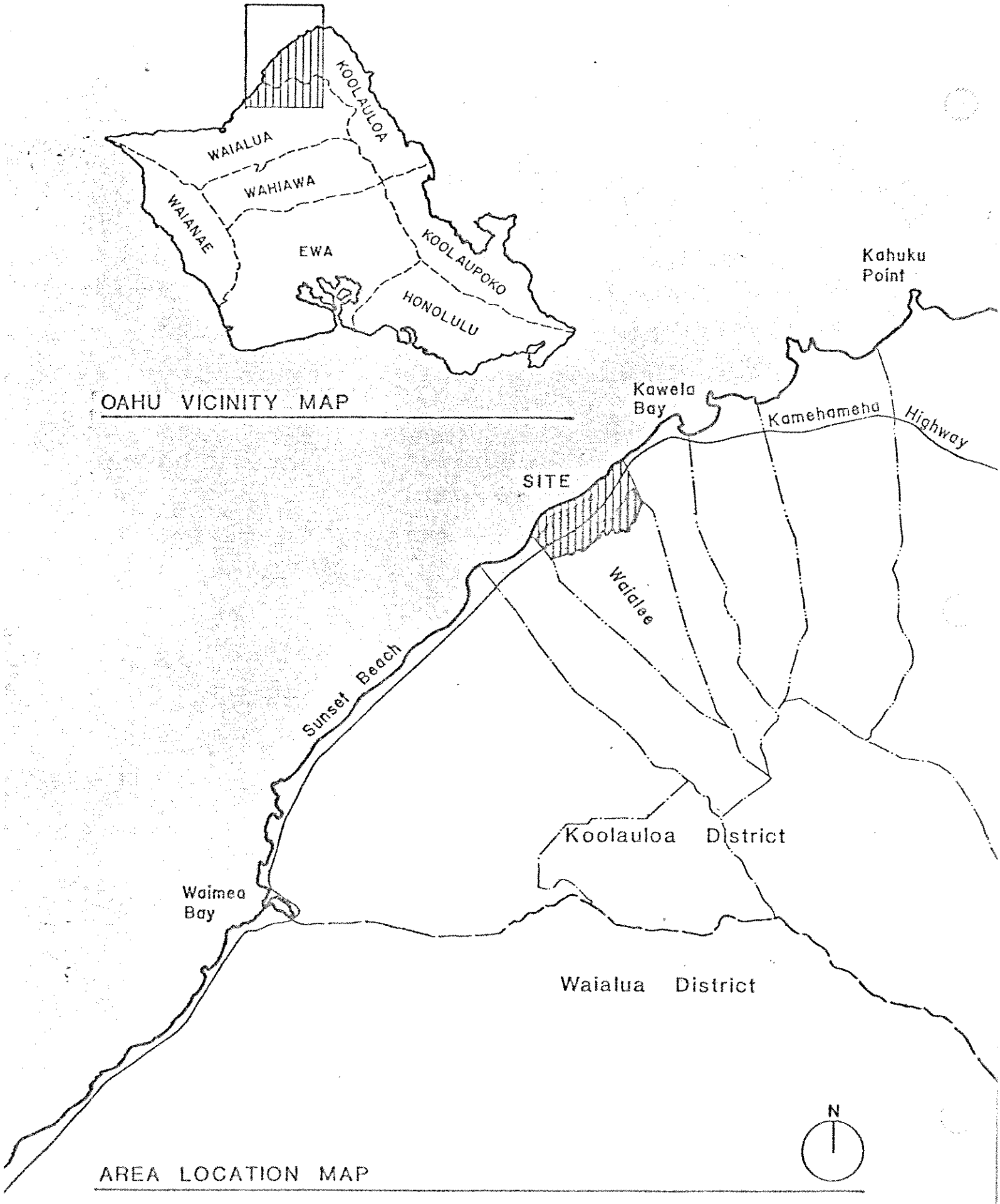

KOOLAULOA
WAIALUA
WAHIAWA
WAIANAE
EWA
KOOLAUPOKO
HONOLULU
OAHU VICINITY MAP
Kahuku Point
Kawela Bay
Kamehameha Highway
SITE
Waialee
Sunset Beach
Koolauloa District
Waimea Bay
Waialua District
N
AREA LOCATION MAP

Figure 1

EXISTING SITE PLAN Not to scale

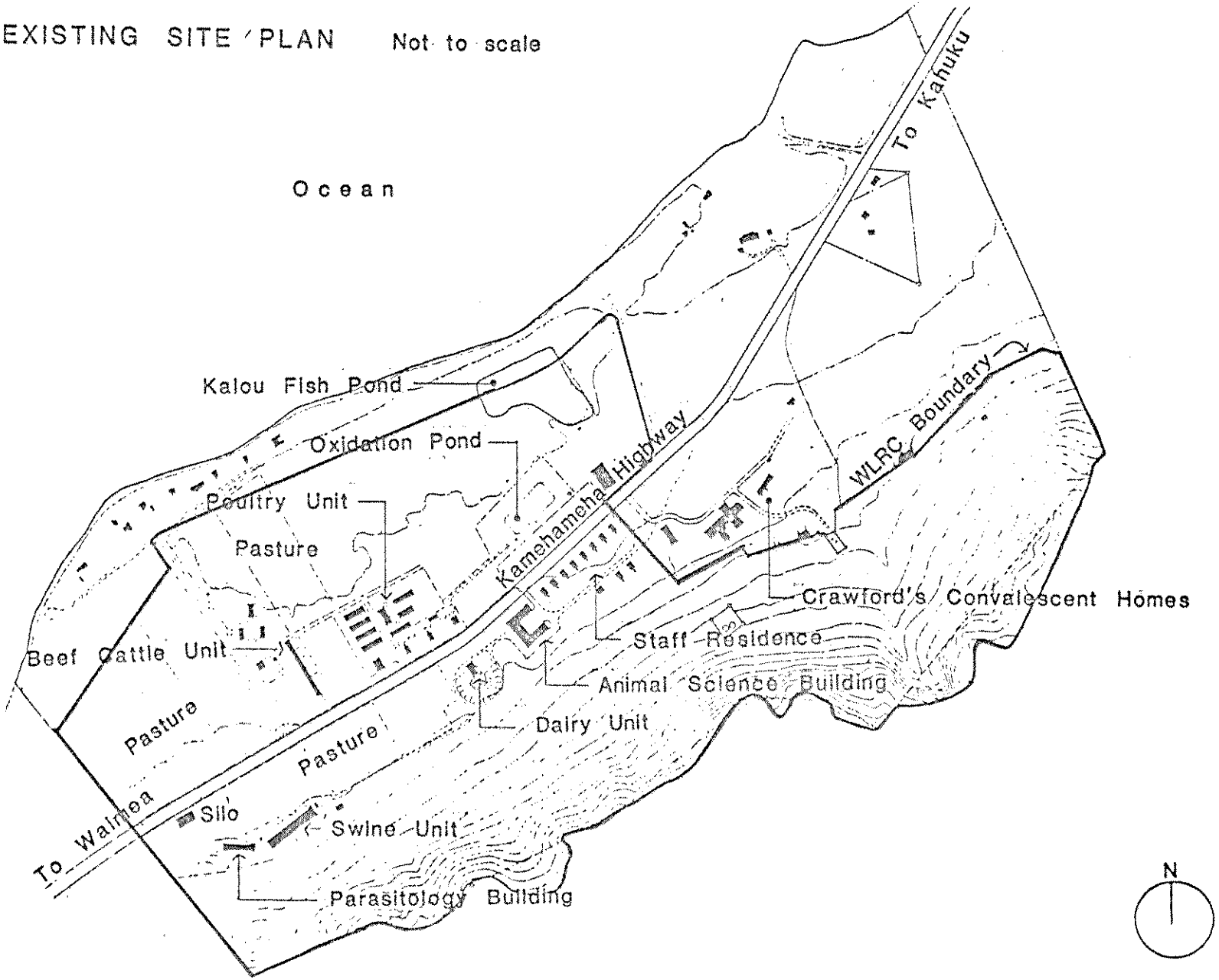


Figure 2

In addition, the Center provides animals and facilities for training graduate students at the Master's level for the Animal Science Department. It would be impossible to carry out the graduate program without this or similar facilities. At present, seventy undergraduate and eighteen graduate students are enrolled in Animal Science. Total students enrolled in Animal Science courses number 255. Personnel from other departments working in interdepartmental research programs also utilize the WLRC to investigate such problems as animal waste handling, utilization of high fibrous feeds, etc.

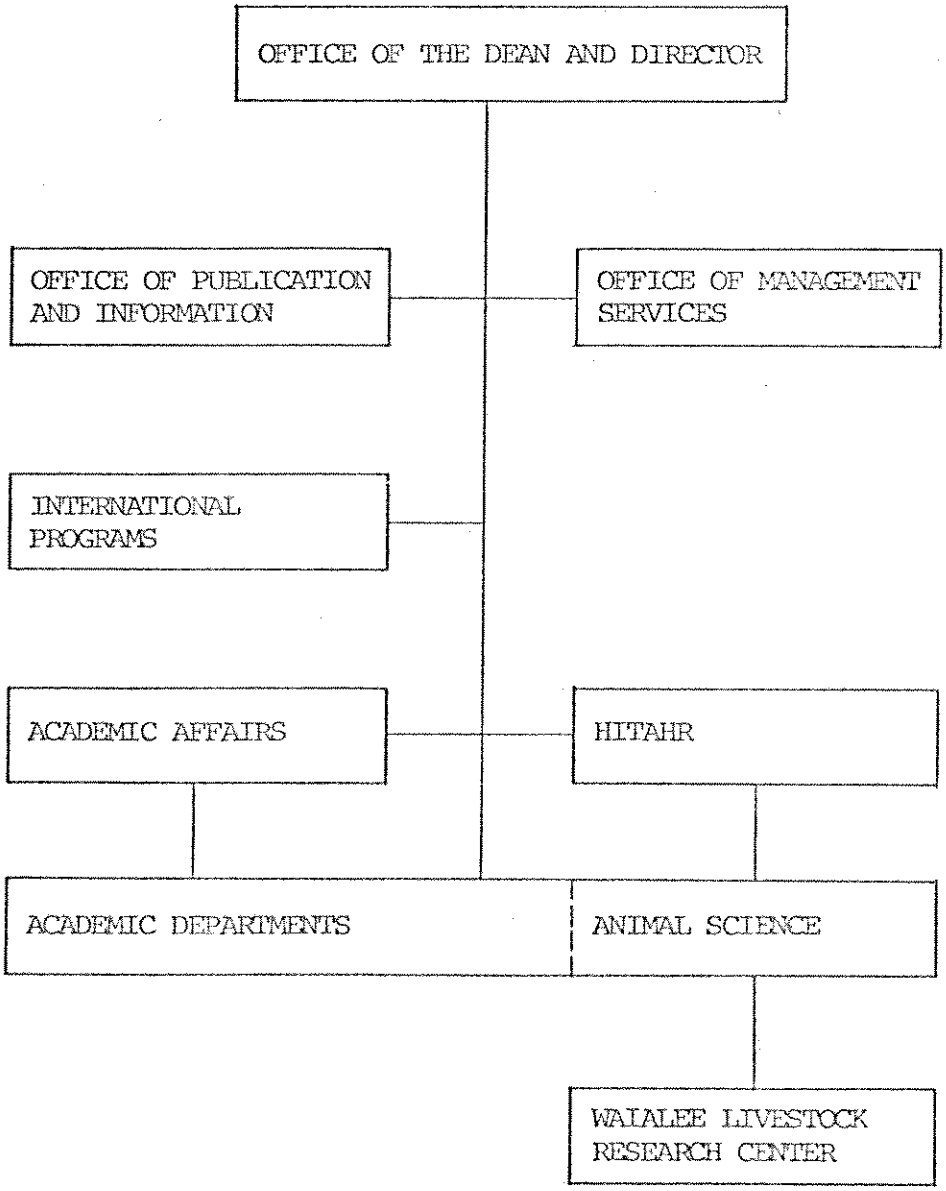
As part of the College of Tropical Agriculture and Human Resources, the WLRC shares the colleges goals:

> To contribute to the advancement of knowledge and the improvement of family and community life in the State by conducting research, development and educational programs in the areas of agricultural technology and products, and the development and effective use of natural and human resources.
>
> To meet the needs of the State and society for highly trained professionals and technologists in the fields of agriculture and human resources development by conducting quality instructional programs at the undergraduate and graduate levels.
>
> To contribute to meeting regional, national and international needs in the fields of tropical agriculture and human resources developments by exploiting the College's designation as a Federal-State center for research and training in tropical agriculture and human resources focussing on the problems of developing countries in the Pacific Asian region.

The College of Tropical Agriculture is undergoing reorganization and as part of this process the HAES will become part of the Hawaii Institute for Tropical Agriculture and Human Resources (HITAHR). (See Figure 3). HITAHR will include all the branch experimental stations, County Extension Services (CES) and the Agricultural Diagnostic Services Center. The combination of the research and extension function is meant to facilitate: 1) coordination between research and extension activities,

Figure 3

ORGANIZATIONAL STRUCTURE OF THE COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES



2) identification of problems and priorities and, 3) mobilization and management of interdepartmental efforts required for interdisciplinary research.

HITAHR will contribute to the College's role as the Federal/State center for tropical agriculture. The College is the nation's only land grant college in tropical agriculture. Recent federal legislation has given support to development of tropical agriculture through the 1966 Food for Peace Act and more recently the 1975 Title XII Foreign Assistance Act. Research programs conducted at Waialee will then emphasize interdisciplinary tropical agriculture development projects as well as basic discipline oriented research. The goals of the HITAHR are as follows:

> To promote discipline-oriented research to advance basic knowledge in the agricultural and applied behavioral sciences.
>
> To conduct interdisciplinary problem-oriented research and development programs to develop the agricultural industries and the natural and human resources of the State and, as a Federal/State center for tropical agriculture and human resources contribute to the development of the agricultural, natural and human resources of the developing countries in the tropics, particularly those in the Pacific Asian region.
>
> To provide State-wide programs as well as County-based educational, problem-solving and advisory services designed to promote the socio-economic well-being and the quality of life of the residents of Hawaii.

Animal Science Department

Currently the WLRC is under the administration of the Animal Science Department. The Department has as its major objectives: 1) to conduct integrated instruction, research and extension programs that contribute to the education of the people of Hawaii and, 2) promote the growth and efficiency of Hawaii's animal production industry, thus aiding the development of self-sufficiency in high quality food products. Waialee is an important part of the Department of Animal Science's overall

program. Its research is important to the development of livestock systems suitable to local conditions and maximizing the use of available resources so that Hawaiian agriculture can remain competitive.

Program Units

The WLRC currently has four (4) major program units as follows: beef cattle, dairy, swine and poultry. These four program units are further aided by support units in feed storage and mixing, maintenance and central administration. Proposed to be added to the existing units are an aquaculture unit and a health management unit.

Program Priorities

Program priorities for the WLRC have been developed by the College of Tropical Agriculture. The priorities are based on a study of the current and future needs of the various animal industries in Hawaii. The priorities are as follows:

1. Beef Cattle
2. Aquaculture
3. Dairy
4. Swine
5. Poultry
6. Other Ruminants
7. Health Management

II. Purpose of this Environmental Impact Statement

This Environmental Impact Statement has been prepared to accomplish the following:

1. To comply with Chapter 343, Hawaii Revised Statutes;

2. To inform the public of the redevelopment and expansion plans for the Waialee Livestock Research Center and to obtain responses to the proposed actions;

3. To assess the environmental setting of the project site and the surrounding area;

4. To outline the possible environmental impacts of the proposed actions; and

5. To outline mitigating actions for the proposed actions.

Comments received during the consultation period will be addressed and, where applicable, incorported into the Revised Environmental Impact Statement.

III. Proposed Action

The proposed action will be the renovation and expansion of the Waialee Livestock Research Center as indicated on the master plan for the WLRC. The master plan, which is shown on Figure 4, is based on the space requirements contained in Table 1. These space requirements were developed through investigation and review of the programs and functions of the WLRC to best meet the needs of the WLRC.

Pertinent items regarding the master plan are as follows:

1. The present site of 135 acres will be expanded to 199 acres.

2. Approximately 54 acres of State land and 10 acres of private land will be added to the WLRC.

3. Of the State land to be added to the WLRC, 12.9 acres are leased to Crawford's Convalescent Home, a private care home, under General Lease No. S3983, which terminates on June 26, 2021. The remaining 41 acres, which are shown on Figure 5, are unencumbered; and the Department of Land and Natural Resources have indicated that these areas can be made available to the UH for the expansion of the WLRC.

4. Of the private parcels to be added to the WLRC, two parcels, Tax Map Key: 5-8-01:03 (2.88 acres) and Tax Map Key: 5-8-01:35 (0.809 acres) are occupied. The remaining private parcels are unoccupied.

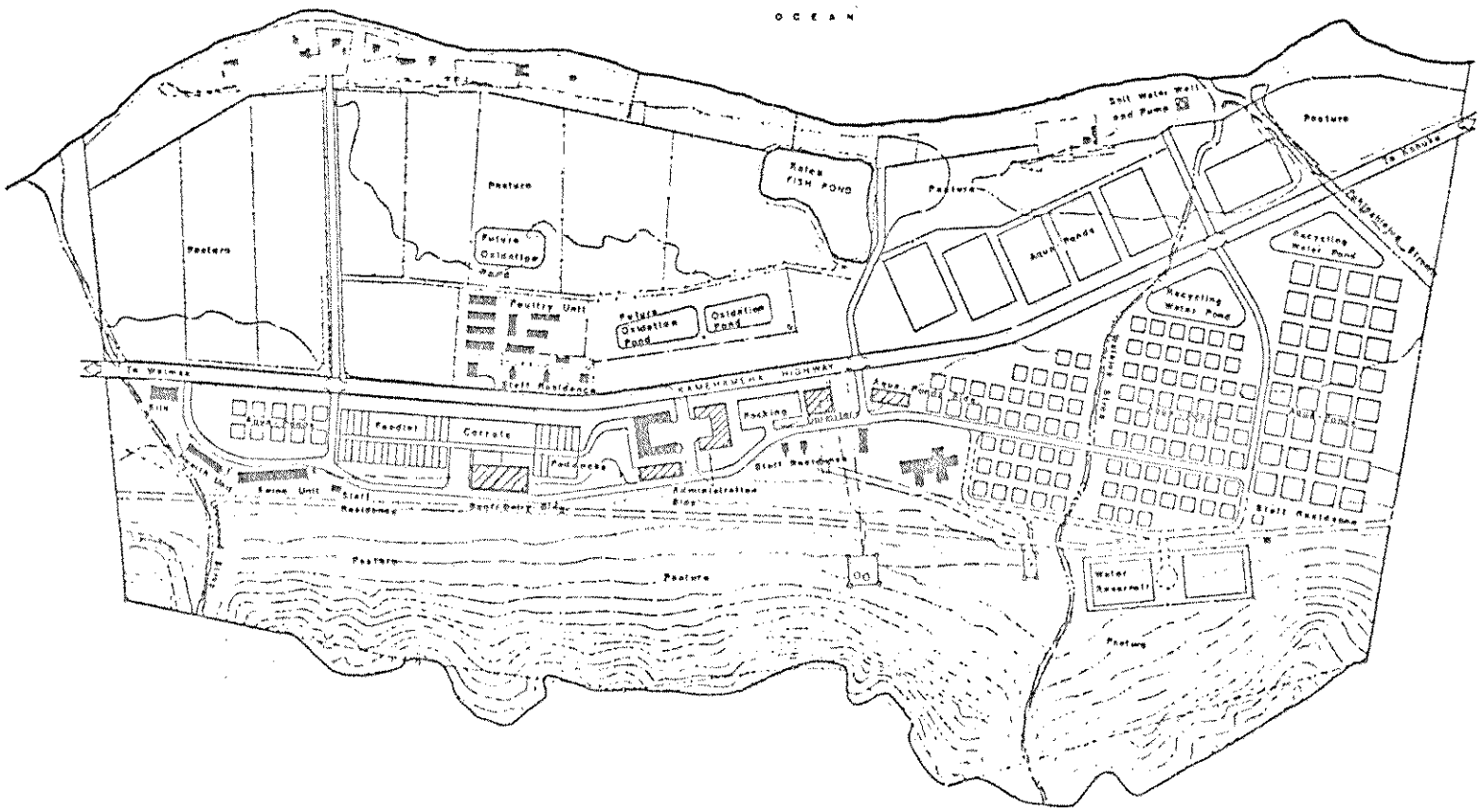
5. An aquaculture unit and a health management unit will be added to the existing program units (beef cattle, dairy cattle, swine, poultry and other ruminants).

6. No habitable structures are proposed to be constructed within the tsunami inundation zone, which encompasses most of the area makai of Kamehameha Highway.

7. Except for the poultry unit, facilities for the various units are located mauka of Kamehameha Highway. The locating of most of the buildings mauka of the highway provides for:

    a. An open expanse that provides views toward the ocean from the highway.
    b. The opportunity to view "over" the WLRC from any of the program units.
    c. Reduced risks of damage due to tsunami inundation.

8. All permanent improvements are located at least 50 feet from the present Kamehameha Highway right-of-way.



MAKAI

MAUKA

SCALE

LEGEND

- Existing Bldg to Remain
- New Bldgs
- Improved Roads
- Unimproved Roads
- Easements
- Streams
- Property Lines
- Drainage Outlet
- Fences

MASTER SITE PLAN

Waialee Livestock Research Center

DAGS JOB # 82-31-3388

Prepared For: Department of Accounting and General Services

Prepared By: H. Hagi Planning and Research, Inc.

Figure 4

TABLE 1

FACILITY/AREA REQUIREMENT SUMMARY

Program Unit/Facilities	Net Space Required (1)	Gross Bldg Area (2)	Total Area (3)	Total Area (ac)
Administration				
Office/Feed/Storage	23550 s.f.	29438 s.f.	98127 s.f.	2.25 ac
Employee Housing	6000	7500	24975	.57
Dormitory	6000	7500	24975	.57
Beef Unit				
Beef Barn	5260	6575	21895	.50
Feedlot	48000	68500	68500	1.57
Corrals/Pens/Chutes	15000	15000	49950	1.15
Sheep/Goat Barn	550	688	2298	.05
Pasture	3615480	3615480	3615480	83.00
Aquaculture				
Building	8550	10688	35589	.82
Ponds	640272	640272	2132106	48.95
Tank Pad Area	22000	22000	73260	1.68
Dairy Unit				
Dairy Barn	3050	3813	12696	.29
Paddocks	15000	15000	50000	1.15
Corrals/Pens/Chutes	7000	7000	23310	.54
Pasture	2178000	2178000	2178000	50.00
Calf Barn (4)	1800	2250	7493	.17
Swine Unit	12210	15263	50824	1.17
Poultry Unit	24816	31020	103297	2.37
Health Management Unit				
Building	2840	3550	11822	.27
Ponds	21530	21530	71695	1.65
Quarantine Areas	1530	1530	1530	.04
	6656638	6700347	8650329	198.59

(1) Net space required = total net space required

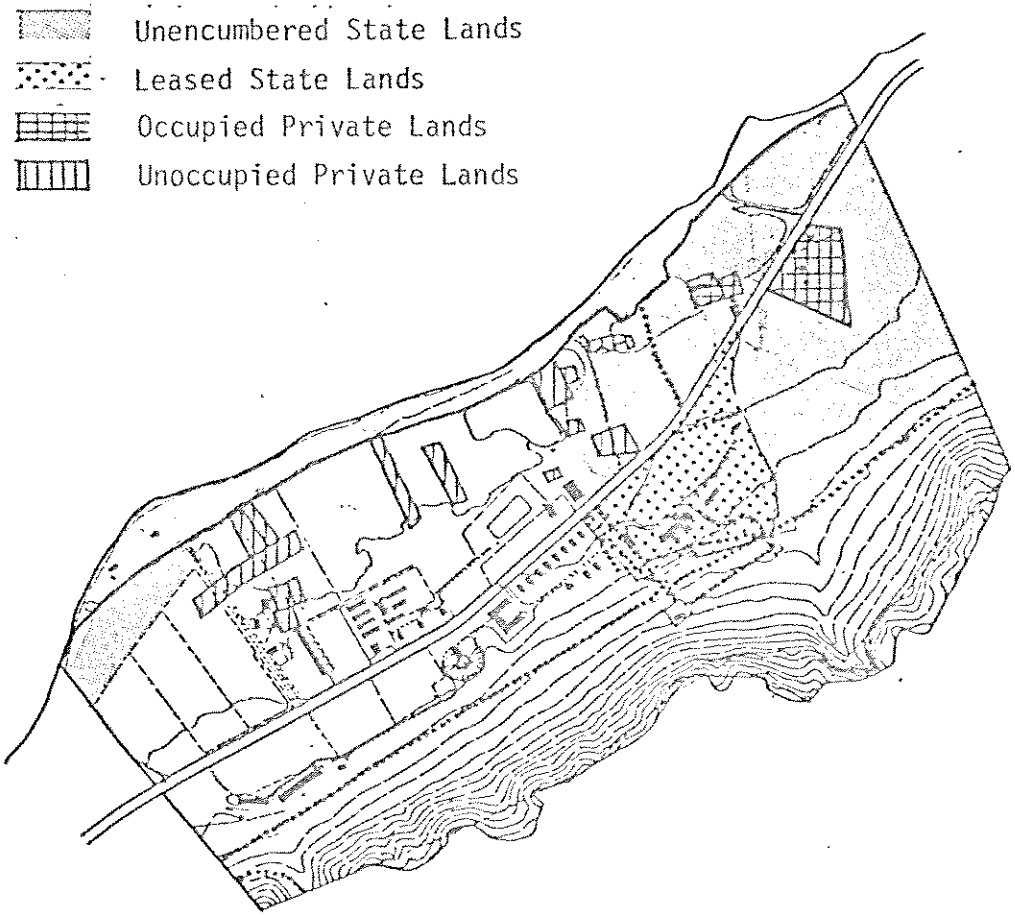
(2) Gross Bldg. Area = Net space required x 1.25 where the gross building area equals estimate of building pad size

(3) Total Area = Gross building area x 3.33, where multiplier factor equals allowance for open space, circulation and landscaping.

(4) Calf barn area required included in beef barn calculations.

Figure 5

AREAS TO BE ADDED TO WLRC



9. The beef and dairy units have been consolidated to provide for joint usage and to eliminate duplication of facilities.

Existing and future program emphasis for the major units at the WLRC are summarized in the following paragraphs.

Administrative Unit

There will be an administrative support unit for the expanded WLRC. The proposed action will include a new building, a dormitory, and possible renovation of the existing animal science building. This facility will house conference rooms, equipment storage areas, work rooms, administrative spaces and dormitory facilities which are to be shared among the various program units. There will also be a parking area to accommodate staff, visitor, and equipment needs.

Beef Cattle Program Unit

The existing beef facilities cover approximately seven (7) acres in the area makai of Kamehameha Highway and is access by an unimproved road. The existing facilities include: a feedlot, corrals, work chutes, utility barn, a holding barn for new born animals, a sheep facility, and goat pens.

The main pastures for beef cattle are located across the access road and comprise about 12.5 acres. Eight (8) acres below the barn area is also used for cattle, but are not fully usable due to swampy conditions especially during the wet winter season.

The proposed action will result in increased pasture for the beef program (75 acres) and the sheep/goat program (8 acres), which is housed with the beef unit. The new beef facilities will be built mauka of Kamehameha Highway, and combined with the dairy facilities. Facilities are to be designed to handle 240 head of cattle. Crops areas to produce corn or sorghum and high moisture corn or other cereals will be provided. Total net acreage provided for the beef program is approximately 85 acres.

Future research programs on beef at WLRC will continue to study the nurtitional effects of local feeds and forages, methods of perserving, storing and processing feedstuffs and continued evaluation of management systems for efficient beef production including confinement management systems for production of feeder calves. Livestock slaughtering and carcass evaluation will be conducted in conjunction with University instructional programs on meat evaluation and carcass study as well as for research.

Aquaculture Program Unit

Research efforts proposed for the WLRC are in aquatic species production and management systems. Aquaculture systems will initially concentrate on fresh or brackish slow-flowing water ponds. Research areas will be in: 1) feeding, pond ecology and pond husbandry, 2) health, 3) engineering, 4) genetics, 5) food processing and 6) marketing.

Basic facilities include nursery replication ponds, grow out ponds, industry size production ponds, indoor laboratory, feed storage and office space. Some facilities may be shared with other farm programs such as classrooms, meeting room, dormitory and machine shop. The objectives of this program are - to develop several efficient systems that are specifically adapted to Hawaiian conditions by examining:

- management systems
- pond conservation, farm design and equipment
- disease and health control
- post harvesting and marketing technology
- stock evaluation and genetic selections of aquatic species.

The proposed action will include the construction of approximately 15 acres of ponds, an aquaculture building housing offices and research

facilities and ancillary facilities such as tanks, pumps and wells. Ancillary facilities include: tanks, salt water well, pumps, water reservoirs and recycling water ponds. The aquaculture program unit will be developed in conjunction with the establishment of the Hawaii Tropical Aquaculture Center a consortium between the University of Hawaii, Department of Land and Natural Resources and the Department of Planning and Economic Development.

Dairy Cattle Program Unit

The existing facilities consist of a dairy building or milking barn; 12 paddocks arranged in a semi-circle around the barn and pastures for the dairy cattle. The barn and paddocks are 20 years old and in need of extensive repairs. The milking barn is approximately 1,600 square feet and the paddocks cover an area of 24,180 square feet.

About seven (7) acres of pasture are located across the driveway from the milk barn. These pastures are primarily for "dry" cows. There are 100 animals; 50 lactating and 50 replacement cows.

The proposed action calls for the construction of new paddocks and joint facilities with the beef unit in a new building and facilities mauka of Kamehameha Highway. Herd size will be increased and pasturage will be expanded. Existing facilities for the dairy unit are currently scattered and the proposed action will centralize the unit in one area. Future research in the dairy program will concentrate on development of total feeding and management systems for dairy cattle in a tropical climate.

Swine Program Unit

Existing swine facilities include the main piggery building and a portion of the adjacent parisitology building. The piggery is a partially

exposed building of approximately 12,200 square feet with office and feed storage areas. The building was built in 1961 and is considered out-of-date for demonstrating modern production systems. About 1,500 square feet of the parisitology building is also used by the swine program. Presently, 30-40 sow breeding herd produces approximately 500 pigs per year.

The present facilities are inadequate and new facilities are needed to enable research programs in baby pig management and segregation of brood animals and production groups. Future studies will include research on; 1) the effect of diet, 2) environmental factors, and 3) weaning age on performance and carcass quality.

The proposed action will result in the near total renovation of the existing building. The breeding herd will be increased to 55 animals and all operations will be unified under one roof within the modified building.

Poultry Program Unit

The existing program occupies an area of four (4) acres makai of Kamehameha Highway. The facilities form a tight complex containing nine (9) buildings and four (4) large cagehouses of approximately 3,200 square feet each. Depending on experiments, cages may be hung above the floor or placed in ground level cage areas. There are three (3) smaller cagehouses, one is used for environmental control experiments and another is used to house several hundred Japanese quails. The third cagehouse is divided in use, 2/3rds to house layers and 1/3rd for office space.

Central to the complex is the poultry feed storage building, covering about 2,800 square feet and is used for feed and equipment storage. Bice Hall is part of the poultry facilities but is only partially used.

Originally built at a poultry laboratory it is currently used for egg hatching and processing. One acre of open space is used for spreading and drying chicken manure for use as fertilizer on the pastures.

The proposed action retains the poultry unit in its present complex but calls for renovation of the structures and upgrading of systems and equipment. The action will result in a more efficient and usable facility.

Future research will continue nutritional studies on reproduction and egg laying. New emphasis will be placed on instructional and training experiences for students. The instruction will be in commerical-industrial operations and this will require a new facility for broiler and layer operations.

Health Management

A Health Management Unit will be developed to provide integrated research related to introduced or induced disease studies. Facilities will include a necropsy laboratory, quarantine areas for pigs and cattle, and ponds to research disease in aquatic species.

The proposed action calls for the renovation of the existing parasitology building to house the health management unit. The modified building will house all the units operations. In addition, there will be 10 aquaculture isolation ponds; each pond will be 200 square meters (2,153 s.f.) in size.

Associated Developments

The proposed action will also involve several activities and construction projects not specifically related to any individual program unit.

First there will be new and improved secondary roads throughout the site providing better access within program areas as well as between the different areas of the farm. Roadways will be mostly 24' to 30' wide and surfaced with asphalt concrete or compacted gravel.

Drainage will be improved on the site. Swales will be constructed along the new roadways and any other potentially troublesome areas and old swales will be repaired and upgraded. Existing culverts will be improved.

Adequate sewage and waste disposal systems will be developed. Existing cesspools will be abandoned and filled. Sewer service will be provided to all facilities. Also, wastewater from facility and animal washdowns will be collected by the sewer system. The oxidation pond system will be expanded.

Finally, the site will be fenced for security purposes as well as for separating different program areas from each other.

Use of Public Funds and Lands

State funds will be used in the expansion and redevelopment of the WLRC. Depending on their availability, Federal funds may also be used.

The 135 acres, presently occupied by the WLRC, is State land which has been set aside under Executive Order (E.O.) 1848 to the UH for the WLRC. Of the 64 acres proposed to be added to the WLRC, 54 acres are owned by the State.

Phasing and Timing

The first increment of the expansion and redevelopment of the WLRC, which will occur on State owned lands, is shown on Figure 6 and is proposed to consist of the following facilities:

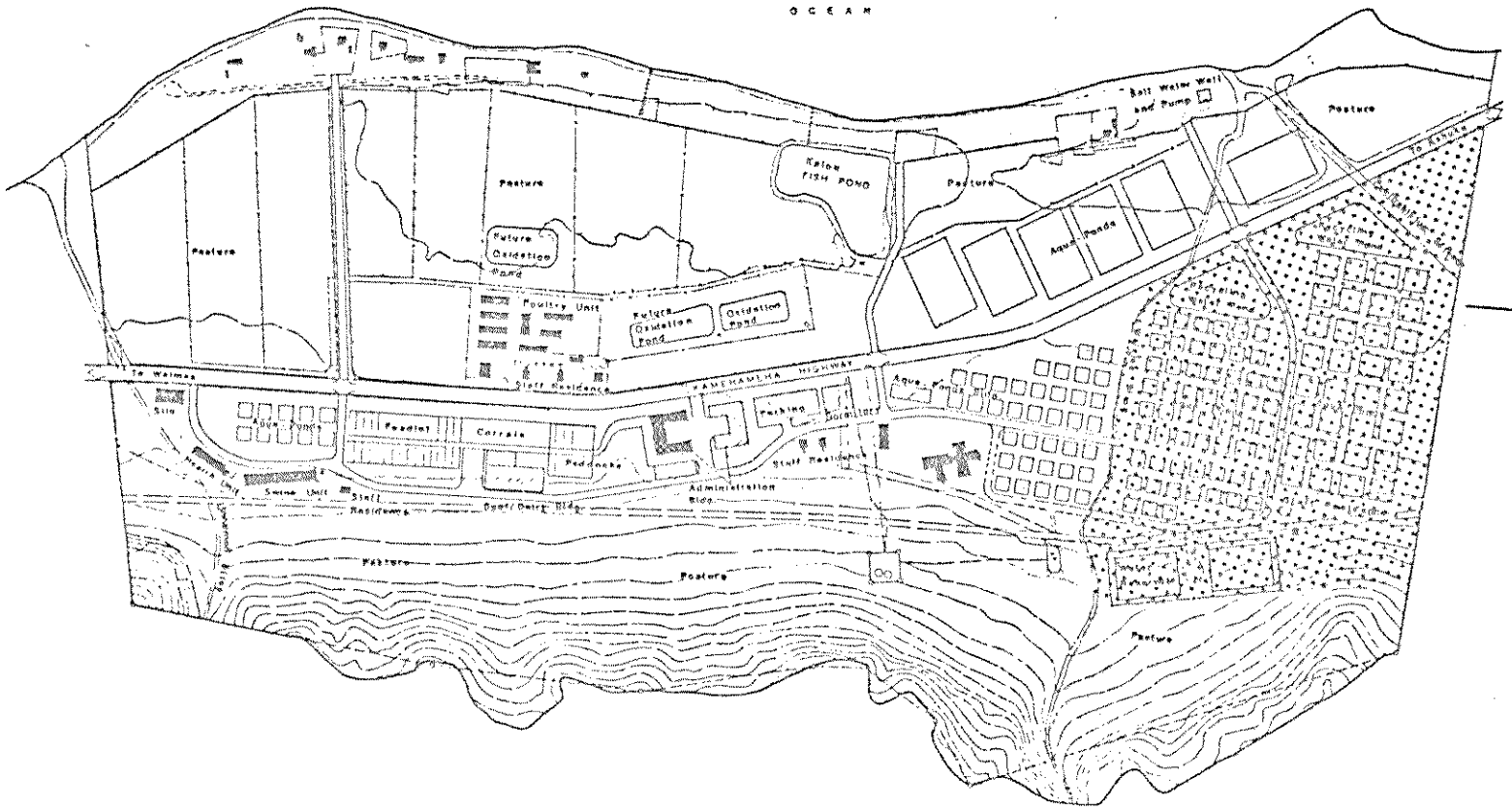
1. Approximately 30 aquaculture ponds with appropriate ancillary facilities.

2. Storage and laboratory facilities which will be temporarily situated in the existing Animal Science Building.

The preliminary cost for this work is estimated at $1,250,000. The tentative schedule for the work is as follows:

FIGURE 6

FIRST INCREMENT PLAN



MAKAI

MAUKA

SCALE 0 200 400 800

LEGEND

- Existing Bldg to Remain
- New Bldgs
- Improved Roads
- Unimproved Roads
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MASTER SITE PLAN

Waialee Livestock Research Center

DAGS JOB # 05-81-3346

Prepared For: Department of Accounting and General Services

Prepared By: M. Magi Planning and Research, Inc.

Start Design:	July 1980
Start Construction:	June 1981

The phasing and timing of future increments will depend upon the availability of design and construction funds.

IV. DESCRIPTION OF ENVIRONMENTAL SETTING

The Waialee Livestock Research Center is located within the narrow coastal area between Sunset Beach and Kawela Bay on Oahu's north shore. Waialee is part of the Koolauloa District which has a population of 13,000 and an area of 43,794 acres. This gives the district one of the lowest population densities among the Oahu districts. The character of the region is rural-agricultural and the WLRC and its activities are consonant with the tone and texture of the surrounding community. Median household income is relatively low (See Table 2 & 3) and the region has experienced periods of economic difficulty; especially since the closing of the Kahuku Sugar Mill in 1971.

Growth Activities

Recently, the area has shown signs of renewed economic life. Diversified agriculture is beginning to play an important role in the area, replacing some of the economic activity lost with the closing of the mill. The State's proposed Kahuku Agricultural Park is a focus for diversified agriculture in the district. Table 4 lists the number and types of people who have applied for use of the park. The park will total 3,360 acres upon full utilization. The traditional Kahuku watermelon is still produced here as well as a successful feed corn operation.

The district is also a growing center for the young aquaculture industry. On Campbell Estate lands there are three (3) major aquaculture farms already in operation. All have plans for future expansion. Lowe Aquafarms will encompass 400 acres of pond when it is completed. This farm is currently raising Malaysian prawn (Macrobrachium rosenbergii) and Kuruma Shrimp (Penaeous japonicus). The farm is planning to go into

TABLE 2

Population Changes

	Koolauloa*	Oahu
1960	8,043	500,409
1970	10,562	635,528
1976** (Est.)	13,000	719,600
% Change 70-78	22.1	14.1

* Koolauloa = Census Tracts (CT) 101, 102
** Source 1979 Data Book

TABLE 3

1975 Population and Housing Characteristics

	Waialua-N. Shore*	Oahu
Median Age (in years)	24.3	25.9
Median Household Income (dollars)	11,732	14,139
Percentage born out of State	41.7	41.2
Percentage high school graduate	58.2	73.7
Percent unemployed	9.0	7.5
Percent owned occupied housing unit	39.8	47.8

* North Shore - Waialua = (CT) 101, 100, 99
** Source: 1979 Data Book

TABLE 4

Kahuku Agricultural Park

Applicant users by category and acreage

Category	No. Applicants	Acreage Min.	Acreage Max.
Vegetable crops	24	355	919
Nurseries	11	243	375
Aquaculture	4	320	465
Dairy	3	375	575
Piggery	8	75	200
Poultry	4	120	135
Misc.	9	30	165
	63	1518	2834

*Source: Kahuku Agricultural Park
State of Hawaii, Department of Agriculture
July 1977

polyculture, the raising of many species in the same pond, when this is feasible. Kahuku Seafood Plantation has leased 165 acres for the production of oysters and Euchema, a commerical seaweed. Kahuku Prawn Farm has 25 acres in Malaysian prawn and plans to expand to 50 acres.

The WLRC's location close to the above activities places it conveniently within an area where diversified agriculture is booming. The addition of the aquaculture unit will allow for close interaction between commercial operators and the center. The location should be mutually beneficial.

Tourism is also a growth industry in the area. The Polynesian Cultural Center (PCC), in nearby Laie, is a premier attraction for Hawaii's visitor industry and the PCC has seen constant growth. The converted Kahuku Sugar Mill is showing signs of stability and vitality after some initial difficulties. The Kuilima Resort is planning a 20 year building program which will add 4,700 hotel units, 1,700 condominiums and 475 residential units to its existing complex. This is an indication of faith in the areas's potential as a resort destination. It is anticipated that by the year 2000 these plans will increase the resident population to 16,000 and the defacto population to 20,000.*

Population

Since the 1970 Census, the population of the Koolauloa District has experienced one of the fastest growth rates on the Island. The 1970 district population was 10,562 while the estimated 1978 population was 13,000. This represents a percent change of 22.9%. The Island wide average was 14.1%. Despite this rapid growth, at 0.2 persons/acre, the district continues to have one of the lowest population on the Island. The density is indicative of the rural character of the district. Other population and housing comparisons are shown on Tables 2 and 3.

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*Source: Preliminary EIS for Kuilima Hotel, Belt, Collins & Associates

The Site

The project site is located within a 227 acre area in Waialee that is divided into two sections by Kamehameha Highway. (See Figure 2).

The "makai" or oceanside section is a low flat coastal plain lined with sand dunes, ironwood trees and coconut palms along the seashore. Several kuleana and private lots are scattered throughout this section but most are concentrated along the shoreline. Kukaimanini Island, a small rocky outcrop covered with stunted ironwood trees, lies a few yards offshore on the Kahuku (northeast) end of the area. The beach on the Waimea end (southwest) of the area is the popular surfing area known as "Velzyland". A significant feature of this section is Kalou Fishpond. The pond is fed by permanent springs in the area and is adjacent to a large rock pile in the middle of this "makai" area.

WLRC facilities located on the "makai" section are the major cattle pastures, beef facilities, poultry facilities and waste disposal facilities.

The land on the "mauka" or mountainside section begins as a continuation of the coastal plain and then angles upward into the talus slopes till it faces the former seacliffs of the Koolau Range. This section is predominantly State land except for a 2.88 acre parcel near the Kahuku end. Crawford Convalescent Home, with a long term lease from the State, is also located in this section.

The silos, piggery and parasitology buildings are located on the Sunset Beach end of the mauka section. Dairy facilities, animal science building and staff residences are located in the central area. Several smaller pastures separate these two complex of buildings. The Kahuku side is mostly vacant State lands. This is the area where most of the planned expansion will take place. (See Figure 5).

The remainder of the areas are steep cliffs or rocky dry channels for three intermittent streams: Waialee, Pahipahialua and an unnamed stream.

Geology

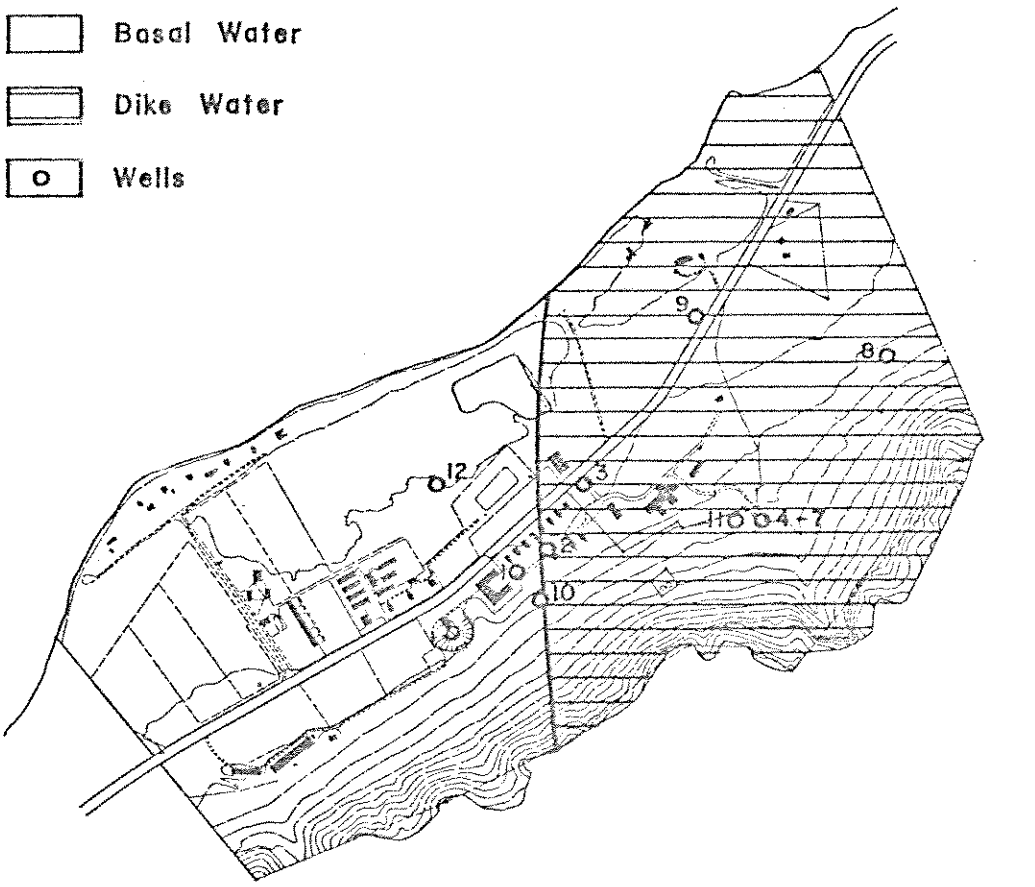
The site is located on the coastal plain and talus slopes of Oahu's north shore. The area's geology is greatly influenced by the volcanic origin of the islands and the activity of the sea. The cliffs behind the farm that create a backdrop for the site were formed during higher stands of the sea when the shoreline was further inland. The talus slopes are from erosion and other forms of weathering which results in the cliff rocks weakening and crumbling down to the base of the cliffs and slopes. The coastal plain is composed of layers of alluvial deposits washing down from upland watersheds mixed with various forms of marine sedimentary material. The deposits from the drainage basins of the Koolaus settle along the coast and near shore waters of the coast and become interbedded with coraline limestone, consolidated and unconsolidated beach sand. The coastal dunes are the accumulation of wind and wave born calcareous and coraline sand.

The site is located on the edge of the Koolau dike zone. Dikes are vertical seams of impervious, denser rock that control the movement of groundwater. At Waialee the dikes are aligned in a roughly north-south direction in parallel lines towards the sea. Because of the existence of the dikes, many wells have been dug on the Waialee site. (See Figure 7).

Slopes

The narrow coastal plain at Waialee rises gently from sea level till it merges with the talus slopes and then angle sharply near the

Figure 7



cliff area. Much of the land has gentle slopes of less than 10%. The area under consideration for the aquaculture ponds has slopes between two (2) and six (6) percent. Lands with slopes greater than 10% are generally not suitable for construction, but can be utilized as a controlled grazing pasture if it is properly fenced and managed. Topographical analysis indicates that 64% of the land has slopes of less than 10%. Eight (8) percent is between 11 and 20 percent and another eight (8) percent is between 21 and 30 percent. Twenty (20) percent of the land has slopes greater than 30 percent. (See Figure 8).

Soils

There are twelve soil types at the site. Table 5 and Figure 9 describes their individual characteristics and indicates where such soils can be found on the site. The major soil series found are: Kaena, Mokuleia, Waialua, and Pearl Harbor.

Kaena soils are poorly drained clay soils composed of alluvium and colluvium. The soils occur on gently sloping to steep alluviul fans and talus slopes. These soils are found at elevations between 50 and 150 feet. Mean soil temperature is 74 degrees F. and mean annual rainfall is between 30 to 40 inches. These soils are used for pasture, sugarcane, diversified crops and house sites. Their natural vegetative cover is composed of kiawe, klu, lantana, koa haole and fingergrass.

The Waialua soils are moderately well drained and found on alluvial fans. The parent material for these soils is weathered igneous rock and these soils are found on slopes varying from nearly flat to steep. They are found in elevations between 10 to 100 feet in areas where annual rainfall averages 25 to 50 inches. Mean soil temperature is 73 degrees

Figure 8

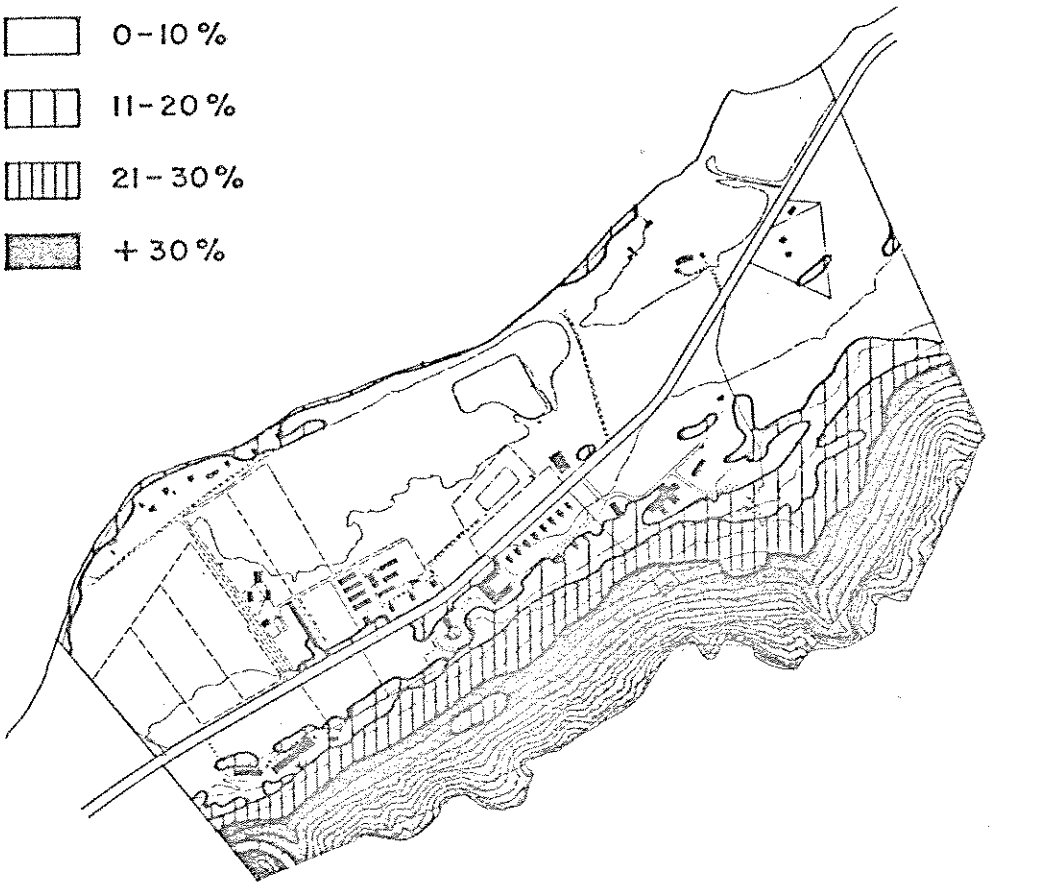


Table 5

SOILS AT WAIALEE

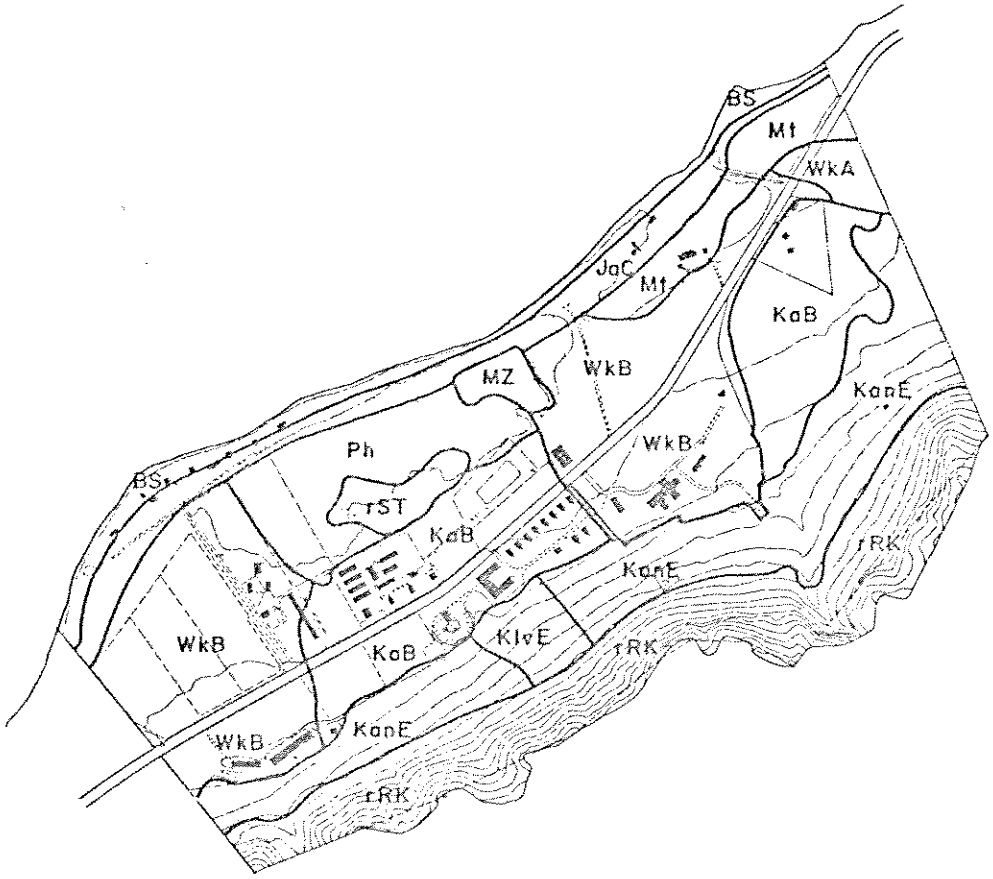
Soil Series & Symbol	Description	Permeability	Shrink/Swell Potential	Suitability for Ponds	Building Location
Kaena Clay (KaB) 2 - 6% slope	Very dark grey clay	Slow	Very high	Fair-Difficult to work-expansive	Fair - Expansive
Kaena Very Stoney Clay (KanE) 10 - 35% slope	Very dark grey stoney clay	Slow	High	Unsuitable Steep slopes	Unsuitable Slope
Waialua Silty Clay (WkA) 0 - 3% slope	Dark reddish brown silty clay	Moderate	Moderate	Fair - Good	Fair - Good
Waialua Silty Clay (WkB) 3 - 8% slope	Dark reddish brown silty clay	Moderate	Moderate	Fair - Good	Fair - Good
Mokuleia Clay Loam (Mt) nearly level	Very dark grey brown clay loam underlain by sand	Moderate at surface - rapid in subsoil	Moderate at surface - low in subsoil	Poor due to sand subsoil	Fair - Good
Marsh Land (MZ)	Flood areas and some open ponds	-----	-----	Good	Unsuitable - High water level
Stoney Land (rST)	Rock Pile possibly underlain by soil	-----	-----	Unsuitable w/o rock removal	Unsuitable w/o rock removal
Pearl Harbor Clay (Ph)	Very dark grey clay organic	Very slow	High	Fair - Good difficult to work high water level	Unsuitable-- low bearing capacity
Rock Land (rRK)	Exposed rock 25 - 90% of surface	Moderate - rapid	High	Unsuitable	Unsuitable

Soil Series & Symbol	Description	Permeability	Shrink/Swell Potential	Suitability for Ponds	Building Location
Beaches (BS)	Calcareous sand and gravel	Rapid	Low	Unsuitable due to excessive seepage	Fair - Good
Jaucas Sand (JaC)	Pale brown calcareous sand	Rapid	Low	Unsuitable - rapid permeability	Good
Kawaihapai Silty Clay (KlvE) 20 - 35% slope	Dark reddish brown clay	Moderate	-----	Unsuitable slope	Unsuitable slope

* Source: Soil Survey, U.S. Department of Agriculture, Soil Conservation Service, Aug. 1972

Figure 9

SOIL



F. General uses of these soils are in sugarcane, diversified crops, orchards and pasture. The natural vegetation consists of swollen fingergrass, koa haole, and uhaloa.

The Mokuleia soils are well drained soils found along the coastal plains between sea level and 100 feet. They are formed by recent alluvial deposits over coral sand in areas with 20 to 40 inches of rain. Mean soil temperature is 74 degrees F. These soils are generally used for sugarcane, diversified crops and pasture. Their natural vegetation consists of kiawe, klu, koa haole and bermudagrass in the drier areas and napiergrass, guava, and joee in wetter area.

The Pearl Harbor series are poorly drained soils found on the nearly level coastal plains between sea level and five feet. These soils have developed from alluvium deposits overlaying organic material in areas where mean soil temperature is 74 degree F. and mean annual rainfall is between 18 to 40 inches. General use for these soils is in the cultivation of taro, sugarcane or pasture while its natural vegetative cover is composed of cattails, mangrove trees, californiagrass and sedge.

For the purposes of pond construction nonstony Kaena soils or Waialua soils are best and this was an important consideration in siting the aquaculture facilities.

Climate

Climatic (meteorology) conditions at Waialee are characterized by a two-season year; mild and fairly uniform temperatures, erratic fluctuation of rainfall and the nearly constant presence of trade winds. In the Central North Pacific, the trade winds blow from the northeast quadrant and represent the outflow of air from the Pacific anticyclone.

The Pacific high pressure system and the trade wind zone moves north and south with the sun, so that it reaches its northermost position in the summer half year. This brings the heart of the trade winds across Hawaii during the period of May through September, when the trades are prevalent 80 to 95 percent of the time. During the winter half year, Hawaii often comes under the influence of mid-latitude weather systems. This is the time of the year when most of the precipitation falls in many areas of Hawaii. Large scale precipitation is usually associated with the synoptic scale weather systems, such as cold fronts, Kona storms and upper level low pressure systems.

Hurricanes and tropical storms are very rare in Hawaii. Only four hurricanes have affected the Island during the past 73 years. Tropical storms, with winds below 74 miles per hour, are more frequent. Unlike cold fronts and Kona storms, hurricanes and tropical storms are not limited to the winter season. They are most likely to occur between July and November.

Islands in the Hawaiian chain show dramatic differences in climate over short distances. This is a consequence of the strong orographic relief of most of the Hawaiian Islands. Frequent and often heavy rains will usually occur at the windward coast of the Islands under trade wind conditions, a result of the interplay of the mountains barriers with the steady stream of the trade winds.

Temperature

In Hawaii, the difference between the coldest and the warmest months averages only 6.5 degrees F. This is the smallest difference of any State in the United States. The steady temperatures result from the small variation in energy received from the sun from season to season.

The surface waters of the open ocean around Hawaii have an average temperature that ranges from a minimum of 73 to 74 degrees F. during late February and early April to a maximum of 79 to 80 degrees F. during late September and early October. (See Figure 10) The mild temperature of the ocean water give rise to mild temperatures in the lower layers of the atmosphere around Hawaii.

At most locations below 5,000 feet elevation in Hawaii, the average daily range in temperature is greater than the range of mean temperatures throughout the year.

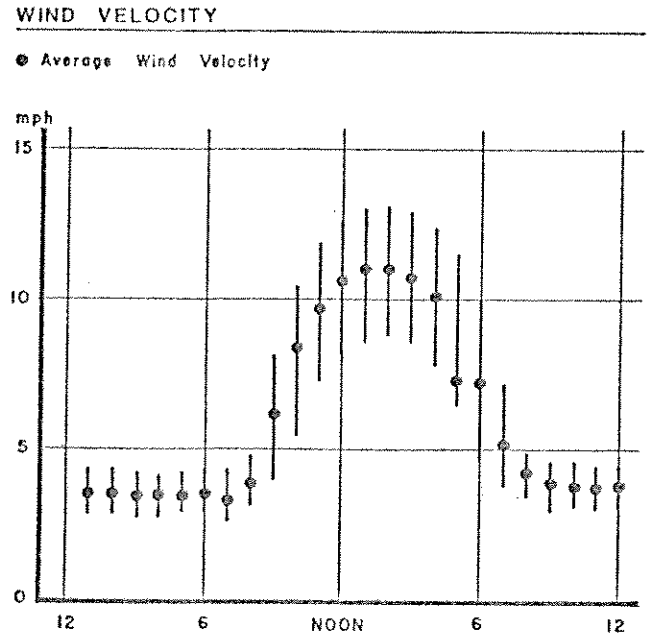
At Waialee, the summer months of August and September bear the highest average temperatures of the year. Temperatures ranging from the low 80's to high 70's have been experienced during these months. Conversely, the cooler winter months of January and February have had temperatures ranging from the low 70's to high 60's. Annual temperatures have been consistant throughout the years, settling within the mid-70's range.

Wind

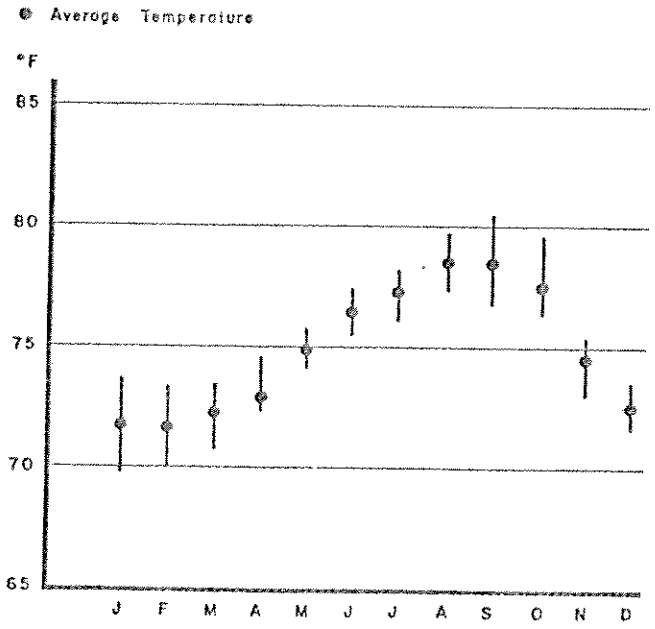
On Oahu, the trade winds prevail during the summer and predominate during the remainder of the year. In their path over and around the island the trade winds are subject to a variety of interacting influences. The Island corners squeeze the trades as they sweep around them. The winds are also constricted when they rise over hilly terrain and accelerate between land surfaces and the trade wind temperature inversion. Complex diurnal effects also influence the wind pattern. On terrains less than 2000 feet, night cooling reduces the turbulence while during the day turbulence increases and so does the wind. On special days land and sea breezes affect the Island, but these are minor forces and are easily overcome by the diurnal pattern or the trade winds.

FIGURE 10
CLIMATE

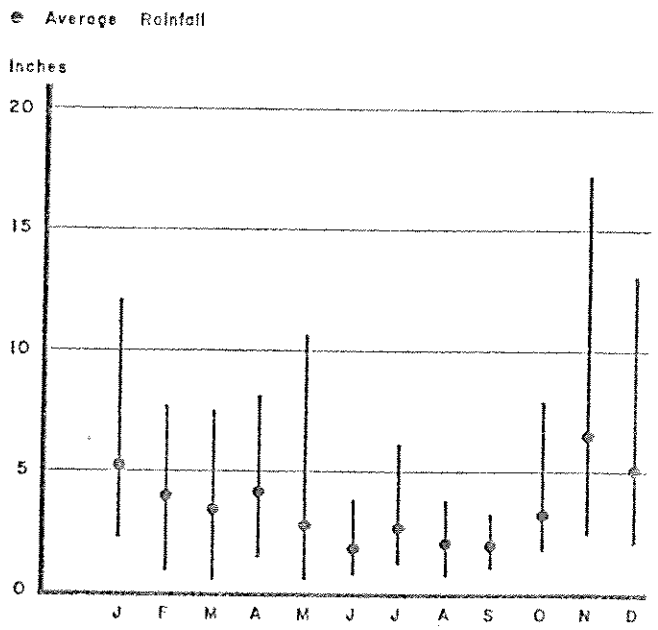
WIND VELOCITY



TEMPERATURE



RAINFALL



Source: U.S. Weather Service

Presently, wind velocity is not recorded at the Waialee site. Data from the Waialua Agricultural Station was examined because it is the nearest recording station to the project site. The exposure of the predominant trade winds is similar at both sites due to their location on the north shore. Readings indicate that wind velocity increases from the early morning hours till midday. From 1:00 a.m. to 12:00 noon, winds increased from 3.5 miles per hour (mph) to 10.6 mph. From 1:00 p.m. to 12:00 midnight there is a consistent decrease from 11.0 mph to 3.7 mph. The summer months averaged 6-8 mph while the winter months averaged 5-6 mph. (See Figure 10).

Rainfall

Rainfall on Oahu is highly variable. Annual totals vary from under 20 inches along the Waianae Coast to over 300 inches at the highest elevations of the Koolau range. This large variability is mainly due to the interaction of the trade winds with local orographic features.

In the lowlands at all times of the year, rainfall is more likely to occur during the night or morning hours, and is least likely to occur during mid-afternoon. The more pronounced diurnal variations in the summer exist because most summer rainfall consist of trade wind showers, and these showers are most apt to occur at night. In winter, most of the rainfall in the lowlands occurs in large scale storm situations and these are as likely during the day as at night. Rainfall is highly variable between similar periods of the year and from year to year.

The Waialee site averages 43 inches of rain per year. June has the lowest monthly averages with 1.87 inches while November had the highest average rainfall with 6.49 inches. (See Figure 10) However, the year fluctuations are great and the monthly average can vary enormously from year to year.

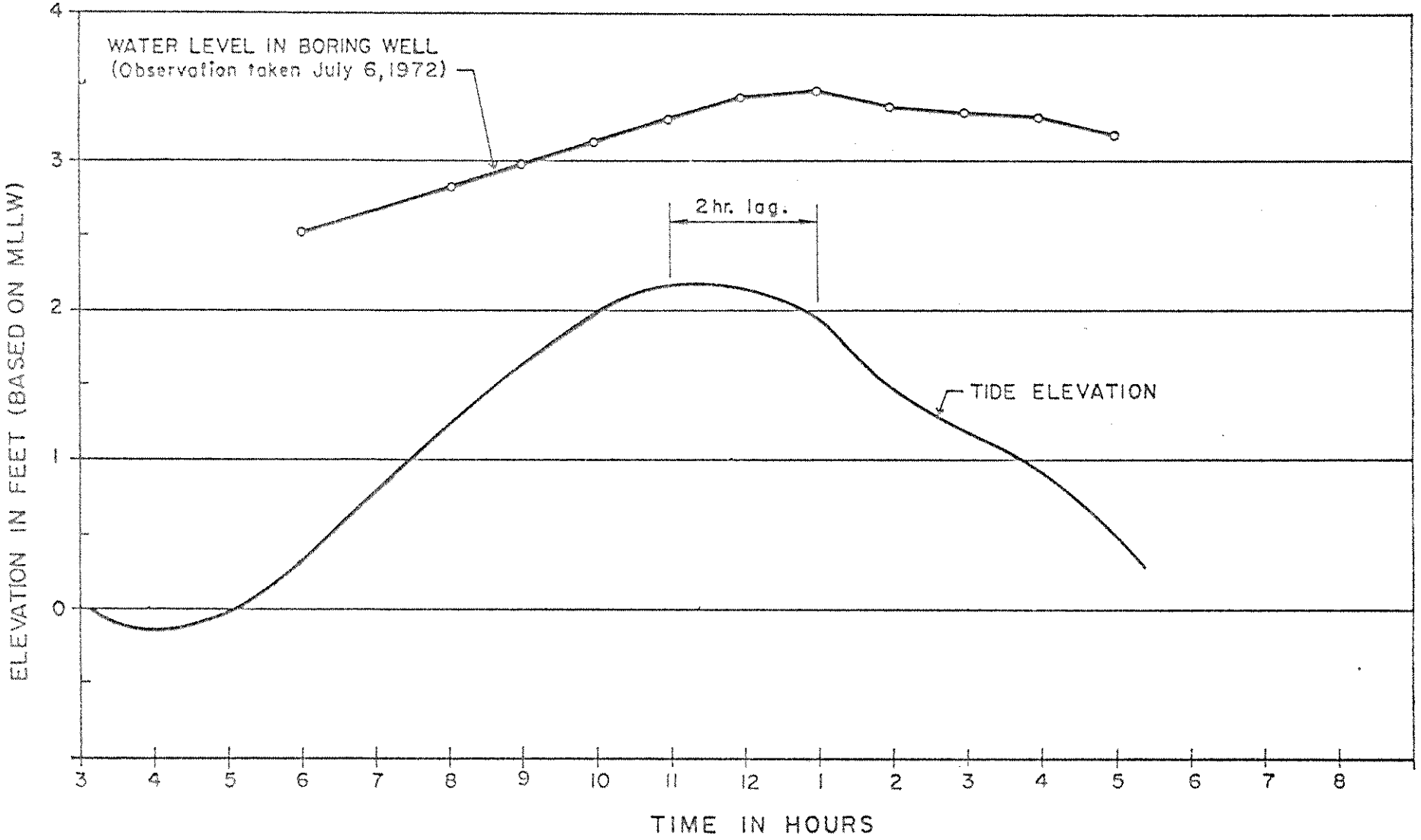
Water Resources and Quality

Factors influencing water resources and quality at Waialee are the rainfall, location next to the ocean, the nature of the geology, the character and size of the drainage basins above the site, and the land uses found in the area.

Rainfall on the oceans surrounding the Islands is between 25 and 30 inches per year while the annual average over the Island is 73 inches. The Waialee site averages 43 inches.

Proximity to the ocean has two influences. First it affects the salt content of the groundwater due to salt water intrusion and the thinness of the fresh water lens (ghyben herzberg lens) at this location. Secondly, rainfall is usually less near the ocean than further inland because the orographic influence of the mountain is not as great. Storm surf impact and tidal fluctuations are two things that can affect the degree of salt water intrusion. Also, excess draw from existing ground water sources can also result in intrusion. The hydraulic gradient of the groundwater at Waialee indicate a strong seaward flow. Variations in water table elevations show a strong tidal influence. (See Figure 11). Despite the strong interaction with the sea, 1975 coastal water data from neighboring Kawela Bay show no change in water quality. (Table 6). The minor influence of orographic rains is due to the low elevation and relative distance from rain inducing mountain summits.

The geology of the site is important in the water storage capacity of the site. In this regards, the existence of the Koolau dike zone on the site is fortunate since the dikes trap the fresh water behind impervious layers of rock. This stored water can be used to meet area needs. It is because of the dikes that Waialee has abundant sources of fresh water inspite of the relatively low rainfall. Another geologic



WAIALEE LIVESTOCK RESEARCH FARM
WAIALEE, OAHU, HAWAII

TIDAL & OBSERVATION WELL FLUCTUATION

Figure 11

TABLE 6

Summary of Kawela Bay Water Quality Sampling Results of the State Department of Health, 1975[1].

Water Quality Parameter	Highest Measurement	Lowest Measurement	Median Value	Applicable Public Health Regulations, Chapter 37A for Class A Waters[2]
Bacteria Counts (MPN/100 ml)				
o Total Coliforms	240	<2	13	median of less than 1,000
o Fecal Coliforms	240	<2	8	not more than 200 for a 30-day average
Chemical Parameters				
o Dissolved Oxygen (mg/l)	7.1	6.6	6.8	not less than 5.0
o Nitrogen as NO_3 and NO_2 (mg/l)	0.08	0.02	0.05	(none specified)
o Kjeldahl Nitrogen (mg/l)	0.64	0.10	0.45	(none specified)
o Total Nitrogen (mg/l)	0.67	0.13	0.50	not more than 0.15
o Total Phosphorous (mg/l)	0.071	0.017	0.035	not more than 0.025
o pH	8.1	8.0	8.0	not more than 1/2 unit from natural level
Physical Parameters				
o Temperature (^{o}C)	27	23	24	Not more than 1.5^{o} from natural temperature
o Turbidity (J.T.U.)	7.9	4.4	5.4	not more than 10% more than natural clarity

[1]The figures herein are based on eight chemical samples and five bacterial samples taken throughout the year.

[2]Present regulations designate the entire Kuilima shoreline as Class A.

Source: Compiled by Belt, Collins & Associates from Department of Health data.

feature is the coastal plain. At Waialee the sedimentary layer above the underlying Koolau basalts is thin. Artesian water level is shallow; between seven and fourteen feet below the surface and as a result, there are several permanent springs in the area. Some of these feed Kalou Fishpond. Due to the above conditions there have been 12 wells dug on the site; 11 numbered wells and one unnumbered well that was never put into operation. (See Figure 7). These wells tap the dike water sources. Of the 12 wells four (4) are sealed and four (4) more are no longer in use. Water quality from some of these wells is documented in Table 7. Most show chloride contents below 250 MG/L, the standard commonly used for potable water.

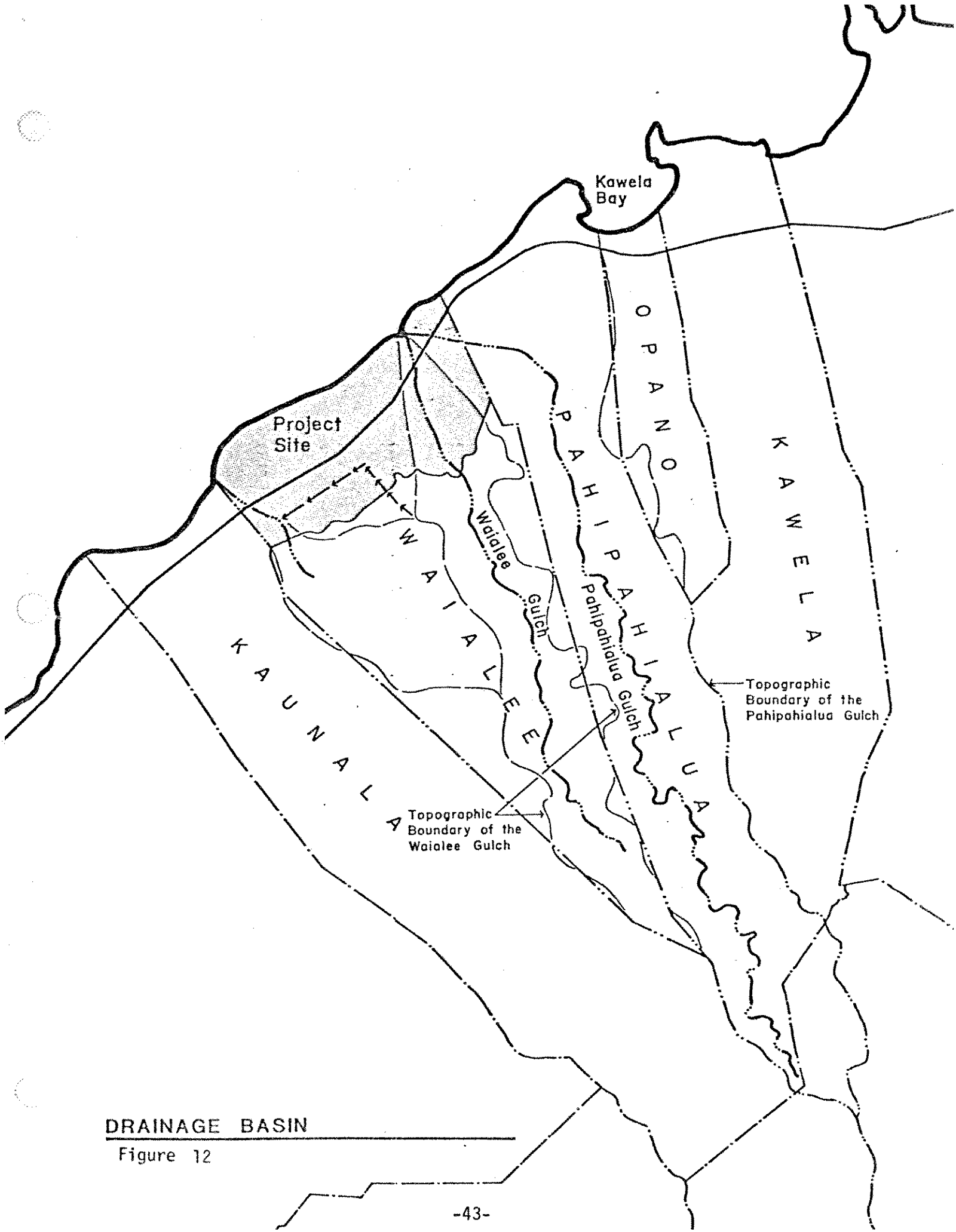
The upland drainage basins whose stream channels cut through the site play an important function in the storm water drainage and erosion pattern of the land. Three streams (Waialee, Pahipahialua and an unnamed stream) flow intermittently through the site and drain an area of 1,297 acres. (See Figure 12). The Waialee Stream channel flows entirely through the site and its drainage basin is located directly behind the site in the partially dissected uplands above the cliffs. The Pahipahialua Stream and basin would be largely unrelated to the site except for the fact that the stream channel veers westward and into the site about a quarter mile from the ocean on the northeastern end of the project site. The basin of the unnamed stream is directly behind the site, but the stream channel veers out of WLRC property a few hundred yards before it joins with the sea. In addition to these streams there is a man-made swale cut into the base of the cliffs. This swale captures the sheet flow that comes off the cliffs and steep slopes and channels this water into the stream channel of the unnamed stream. These drainage basins

TABLE 7

SELECTED DATA OF WELLS IN WAIALEE AREA

USGS WELL NUMBER	OWNER	YEAR INSTALLED	SIZE DIAMETER	LOCATION: ELEVATION FEET	INITIAL STATIC WATER LEVEL FT.	TEST PUMP RATE GPM	PUMP CAPACITY MGD	ACTUAL WATER DRAFT AMT MGD	MAXIMUM CL MG/L	MINIMUM CL MG/L	USE, YEAR
4101-01	State of Hawaii	1921	8	22	13.2	NA	NA	NA	NA	NA	sealed, '60
4101-02	State of Hawaii	1921	8	22		NA	NA	NA	NA	NA	sealed, '60
4101-03	State of Hawaii	1921	8	22	15.6	NA	NA	NA	NA	NA	sealed, '60 USGS Observat
4101-04	State of Hawaii	1938	6	67	18.2	80	NA	NA	49	NA	sealed, '60
4101-05	State of Hawaii	1939	8	75	21.8	NA	NA	NA	75	48	unused, '74
4101-06	State of Hawaii	1941	6	86	19.4	NA	NA	NA	330	40	unused, '74
4101-07	State of Hawaii	1945	14	81	17.1	450	0.50	0.3	63	37	municipal,'74
4101-08	Honolulu BWS	1951	10	63	19.6	375	0.72	0.4	40	37	municipal,'74
4101-09	Fukunaga,H.	1957	8	19	7.8	110	NA	NA	192	143	irrigation,'
4101-10	University of Hawaii	1959	10	58	3.6	255	NA	NA	112	89	domestic, '7
4101-11	Honolulu BWS	1970	12	82	18.6	577	NA	NA	380	228	unused

SOURCE: L. ALD, DLNR. GROUND WATER INDEX AND SUMMARY THRO H 1977



DRAINAGE BASIN

Figure 12

are important both in directing the run-off from rainfall as well as defining the recharge area for the dike complex and groundwater. Stream-flow for all the basins is intermittent and generally flow to the sea only in periods of heavy or prolonged rainfalls.

Land uses and activities that affect water quality include waste disposal facilities, water wells, use of pesticides, construction activity and aquaculture ponds. Care must be taken in the construction and operation of waste disposal systems to prevent groundwater contamination and contamination of potable water sources. The operation of wells in the area needs to be monitored to prevent excess draw on the fresh water resources; otherwise there may be salt water intrusion. Pesticide use and construction activity should follow guidelines to prevent unnecessary run-off or long term toxicity from residuals. Discharge from ponds will require monitoring.

Water Use

The Board of Water Supply operates two municipal wells (#4101-07, 5404-08) on the site that provide water to the areas residents. These wells have an 1.2 mgd capacity. The WLRC's average daily consumption from the municipal source is 28,416 gallons per day of which approximately half is used for domestic purposes. (See Table 8 below).

TABLE 8

Average Daily Water Consumption

From July 1971 to June 1972

Crawford Convalescent Home	6,850 gpd
Milking Palor-Agricultural Science Complex	10,966 gpd
Staff Housing (11 homes mauka of Kam Hwy)	7,133 gpd
Poultry Area (including Bice Hall, three staff housing)	3,467 gpd
Total	28,416 gpd

The remainder is used by the farm for washing down animal pens, watering and washing of animals. Besides the two municipal wells there are two other wells in operation on the site; one is a private well (4101-09) and the other is used by the WLRC to wash down the animal facilities. The Center also uses water from Kalou Fishpond to irrigate pastures. The WLRC well has a capacity of 0.4 mgd. Water from the WLRC well is pumped into a mauka reservoir with a 10,000 gallon capacity.

Most of the anticipated increase in water use will come from the addition of the aquaculture ponds to the WLRC. The demand from the ponds is calculated on the basis of maintenance demand and flushing demand. Maintenance demand is the amount of water needed to keep the ponds filled by replacing loss from evaporation and seepage. It is calculated on the basis of 50 gal./min./acre/day which is the rough average used by the industry. For the 14.7 acres of ponds ultimately envisioned for the WLRC this demand comes to 1.1 mgd. Flushing requirements call for replacing 1/3 of pond volume in an eight (8) hour period. This comes to a total of 350,000 gal./day. The total is approximately 1.45 mgd which represents an estimated peak demand. Resource limitations may reduce the final design capacity. The amount of increase will depend on the acreage of pond constructed, their configuration, arrangement, and pattern of use.

The use of holding ponds for the re-use of fresh water discharge from research ponds is under consideration as a means of reducing fresh water needs. Salt water for marine or brackish water studies will be obtained from a well to insure its purity.

Coastal Waters

The coastal waters along the shores of the Waialee Livestock Research Center are designated Class A, open coastal water under Chapter 37-A, Water Quality Standards of the Public Health Regulations.

Class A waters protect recreational (i.e. fishing, swimming, bathing, and other water contact sports) aesthetic enjoyment and the support and propagation of aquatic life. Open coastal waters are defined as "marine waters bounded by the 100 fathom (183 meters or 600 feet) depth contour and the shoreline excluding embayments". These designations are extremely stringent and during normal conditions, coastal waters seldom meet all the standards of the Public Health Regulations.

The Department of Health has set up a sampling station nearby at Kawela Bay which measures water quality. The waters have been judged as unchanged and consistent; thus samples are rarely taken from these locations. The last samples were taken in 1975. Table 6 lists the water quality data from this station.

Waste Disposal

Presently, there are no existing municipal sewers near the WLRC. The future Pupukea-Sunset disposal system is to extend to the Waimea boundary of the WLRC, however, no definite timetable has been set for its implementation.

The WLRC is presently serviced by two types of sewage disposal systems. The first type, cesspools, is limited to the poultry, swine and five (5) residential units. The remaining facilities and the Crawford's Convalescent Home are handled by a system composed of a septic tank, oxidation pond and seepage pit. In a study of waste disposal systems for the WLRC by the firm of Sunn, Low, Tom and Hara; the firm's report mentions that the cesspools have been known to malfunction. The malfunctioning of the cesspools have been attributed to poor soil conditions.

Farm animal wastes are handled in two manners. Manure from the dairy, beef and poultry units are dried and later spread over the pastures. The second method involves solids that are washed into a sump and later pumped via an irrigation system and spread over the pastures.

Some of the waste water from the washdown operations is drained out into the ground. A new sewer system will be developed to handle this discharge.

An adequate sewage and waste disposal system will be developed in all phases of the redevelopment. The oxidation pond system will be expanded to serve the expanded facility and all facilities will be tied together into a single sewage treatment system. There will be no discharge of waste water into the sea or stream channels.

Odor

Although the Department of Health has received no complaints about the odor problem on site, the WLRC has had some local complaints. Odors occasionally become a problem during unusual weather conditions. Odors generated by the Center are typical of agricultural livestock operations and result mainly from animal wastes and wastewater from animal and facility washdowns. For the most part, these odors are unavoidable for livestock operations. The problem is recognized and appropriate consideration will be given in the placement of any new facility on the site. Consolidating all waste disposal facilities into a single system should also help to minimize the problem. A buffer zone will be maintained between facilities and existing residential housing.

Vectors

Vectors are not a problem on the site. The Vector Control Branch of the Department of Health performs periodic checkups and provides occasional treatment on the site. The only noticeable problem is the breeding of

mosquitos in the lower makai pastures; especially in the wet season. A new drainage system for these lands will eliminate the need for this service.

Seismology

Hawaii is a chain of volcanic islands where earthquake and eruptions occur frequently. However, due to its distance from the active zones of vulcanism on the Big Island, the current earthquake hazard rating for Oahu is "1". This means that damage from earthquake hazards is possible but remote; however, a March 1973 study sponsored by the University of Hawaii's Hawaii Geophysics Institute titled "A Study of Past Earthquakes, Isoseismic Zones of Intensity, and Recommended Zones for Structural Design for Hawaii" by Furumoto, Nielson and Phillips, recommends changing Oahu's earthquake designation to "2" because of the possiblity of quakes originating in the Molokai Fracture Zone. This zone is much closer to Oahu and quakes generated here would have a much more devastating impact than those originating in the vicinity of the Big Island; even if they are of a lower magnitude. However, all structures to be constructed will be designed in accordance to Zone Three requirements; thereby minimizing this hazard.

Air Quality

Hawaii's overall air quality is excellent. The WLRC activities generate negligible quantities of pollutants and with its location in a low density agricultural district there is no air quality problem. Due to the general uniformity of ambient air quality in Oahu's rural districts, the State Department of Health uses the readings taken from its Waimanalo station as representative of communities or areas along the north shore. Also, because readings for pollutants like carbon monoxide and sulphuric oxides are negligible, the only readings taken were for particulate

matter. The annual average reading for particulate matter at the Waimanalo station was 29 micrograms per cubic meter over a 24 hour period. The range was between 15 to 61 micrograms. The Hawaii air quality standard for particulate matter is 100 micrograms per cubic meter for a 24 hour period.

Though air quality is excellent, there are some emmission sources that could significantly degrade the quality locally. The main sources are vehicular traffic and construction activity or equipment use on the site. The impact of these sources will vary greatly with degree of emmissions and weather conditions. The Waialee site is fortunate in that the northeast trades blow almost constantly and help to circulate the air masses. When the trades do occasionally break down there are usually light and variable winds that result from the diurnal heating and cooling of the Island. Due to the persistant movement of air masses, the occurrence of thermal inversions which create the worst conditions for air pollution is highly unlikely. The proposed action will have no measurable impact on the air quality of the region.

Noise

The last statewide noise survey was taken in 1974 and at the time no readings were taken of the small communities on the north shore because earlier readings have shown them to be similar to noise levels found in Waimanalo and Olomana. The Waimanalo readings averaged 50.0 dBA (decibels: sound measure weighed to human response) and the range was between 54.5 dBA and 44.5 dBA.

Existing sources of intrusive noises are vehicular traffic, equipment usage and farm animals. None of these are at levels that would be harmful to human health and well-being and existing distances between

facilities and residences provide further protection. Future facilities and activities will be sited to insure that existing levels are not significantly affected.

Visual Quality

Waialee is a place of dramatic beauty and quiet pastoral moods. A coral sandy shoreline gracefully skirts the makai edge of the area. The coastal sand dunes along the shore are lined with ironwoods, coconut, and date palms and form a pleasing green fence between the WLRC facilities and the ocean. The beach area has great potential as a recreational site.

There are no buildings over two stories high and the low rise nature of the structures is consonant with the rural character of the region. The pastures, the rising talus slopes and loosely scattered structures end abruptly with the Koolau sea cliffs along the mauka edge of the site.

Renovations will not significantly affect the visual quality of the site. The repair and upgrading of several of the facilities will improve the site. The aquaculture ponds and facilities will be constructed on land overgrown with koa haole and scrub bushes and the sites low rise character will be preserved in the design of these facilities.

Power

The WLRC is served with power by the Hawaiian Electric Company via a 12 KV (kilo volt) transmission line which parallel Kamehameha Highway. Traversing the mauka portion of the site is a segment of the Hawaiian Electric Company's Waimea to Kahuku 46 KV transmission circuit. The proposed action will not require the relocation of this line.

The existing power service is via selected take-off point along the Kamehameha Highway transmission line. The redevelopment of the WLRC

will require the similar service as those presently exist. Redevelopment call for the consolidation of the number of take-off point to control distribution methods. The WLRC will further be provided with its own emergency power system for the refrigeration units, pumps. and air compressors for the aquaculture facilities.

Communications

The WLRC is serviced with telephone service by the Hawaiian Telephone Company. With the exception of the dwelling units, only the swine, poultry, and administrative and central facilities are provided with telephone service at the present time.

The new facilities will be planned to provide all program units with telephone service that is centrally controlled.

Transportation and Access

Access to the site is via Kamehameha Highway. Travel time from the UHM to Waialee is approximately 70 minutes by way of Wahiawa and 90 minutes by way of Kaneohe. At Waialee the highway has a 50 foot right-of-way and divide the site into two (mauka and makai) sections. Internal farm circulation is via an unimproved roads. (See Figure 13).

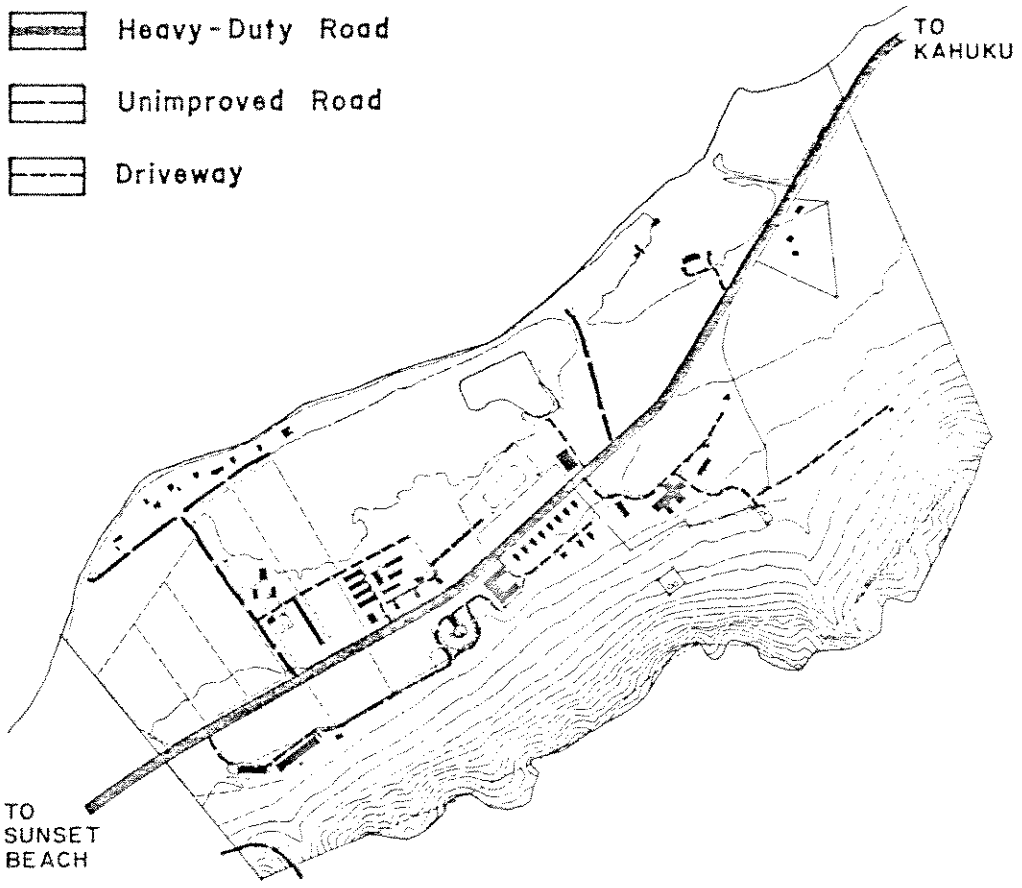
MTL (Municipal Transit Lines) bus route 52 services the area and buses run in both directions; via Wahiawa or via Kaneohe with 30 minute headways in each direction.

Traffic

The estimated two-way capacity of the highway between Pupukea and Kahuku (The segment on which the site is located) is 1,425 vehicles per hour. However, for a driver coming from the Manoa Campus, driving time will be affected by bottlenecks along the way such as the segment of Kamehameha Highway curving around Waimea Bay. Roadway configuration and the accesses to Waimea Bay and Waimea Falls Park reduces the capacity of

FIGURE 13

ACCESS



this segment to 1,000-1,200 vehicles per hour. A Department of Transportation study done in 1977 shows current weekend traffic is often 50% greater than weekday traffic. The study shows that this segment of the road is approaching peak capacity on weekends.

The greatest potential effect on future traffic growth is the planned expansion of the Kuilima Resort in Kahuku. The Preliminary EIS for the Kuilima project predicts traffic which may be generated by the resort expansion and other future growth in the region. By the year 2000 traffic analysis projects that highway capacity will be exceeded on both weekday and weekend traffic although less significantly on weekdays. Table 9 shows the projected traffic volumes.

TABLE 9

PROJECTED TRAFFIC VOLUMES

Location	Capacity at Level of Service (vph)	Current Peak Volume Weekday[1]	Year 2000 Projected Peak Volume (vph)[2]		Year 2000 Excess (Deficit) Capacity (vph)[3]	
			Weekday	Sunday	Weekday	Sunday
Waimea	1,200	600	1,760	2,450	560	1,250
Kii Bridge	1,460	497	1,690	2,180	230	720

The percentage of increased traffic related or attributed to the Kuilima project is approximately 50 percent. The projected increase in total daily traffic volume is 123% at the Waimea station and 277% at Kii Bridge.

[1]August, 1977 Traffic Count, Department of Transportation

[2]Projected Peak Volume by Belt, Collins, and Associate

[3]Excess Capacity - Capacity level minus projected peak

In the short run the proposed action at Waialee will create some increased traffic due to construction activity. Long term increases in traffic will be the result of larger numbers of people using the site due to the inclusion of the aquaculture program to the existing activities. The increase in traffic generated by users of the site will be small and largely confined to weekdays when the level of traffic is well below the design capacity of the highway. Construction generated traffic will be small and temporary in nature.

Flora and Fauna

The Waialee site contains no known representatives of flora or fauna on the list of endangered species. There is also little endemic or indigenous species of any kind on the site. The site has been subjected to generations of agricultural, institutional and residential use and little is left of the native biota. Table 10 is a partial list of some of the more prominent flora on the site.

Flora - There are several distinct vegetation types and cover at Waialee. The predominant vegetation is "koa haole" (Leucaena glauca), generally a bush or low tree type of cover which make up large tracts from the seashore to the upland cliffs. It covers most of the vacant land on the site. The next most prominent type of cover in terms of area is grass. Grass pastures, both managed and unmanaged, make up large areas of the site. The bulk of these pastures are located on the makai (seaward) side of Kamehameha Highway. The managed pastures are mostly panicum, pangola, and california grass. The unmanaged grass areas are mostly guinea grass and kikuyu grass. These pastures are used in experiments determining the nutritional value of various types of feed and forage. The final type of cover are tree and palm. The most

Table 10

Partial List of Flora Found Within the WLRC Project Site

	Common Name	Scientific Name
Palms:		
	Coconut	Cocos nucifera
	Royal	Roystonea regia
	Date	Phoenix dactylifera
Trees:		
	Ironwood	Casuarina equistifolia
	Christmasberry (Wilelaiki)	Schinis terebinthifolius
	Chinese Banyon	Ficus retusa
	Plumeria	Plumeria sp.
	False Kamani (Tropical Almond)	Terminalia catappa
	Hau	Hibiscus tiliaceus
	Milo	Thespesia populnea
	Mango	Mangifera indica
Shrubs:		
	Koa haole	Leucaena glauca
	Poinsettia	Euphorbia pulcherrima
	Hibiscus	Malvaceace sp.
Grasses:		
	Guinea	
	California	
	Panicum	
	Pangola	Digitaria decumbens
	kikuyu	Penniesetum clandestinium

conspicuous of these are ironwoods (Casuarina equistifolia) - coconut (Cocos nucifera) and date palms (Phoenix dactylifera). These trees and palms are found in rows along the shoreline and roadways where human activity and settlements are located. Some date palms have spread naturally up the talus slopes. Among native plants there are some relatively large clusters of "milo" (Thespesia populnea) and "hau" (Hibiscus tiliaceus). Mixed with the koa haole tracts are occassional clumps of christmasberry (Schinus terebinthifolius). Miscellaneous common plants are located around the residential areas.

Fauna - The site is limited in variety of fauna. Other than the research animals of the WLRC, the domestic pets of the staff residents, other residents, and landowners around the site, there is little of biological interest. Flocks of cattle egret (Bubulcus Ibis) frequent the cattle facilities and pastures. These birds feed on insects found near livestock and miscellaneous prey such as crayfish found in the streams, springs and pond.

A flock of Chinese Geese are kept at Kalou Fishpond. Given the open water character of Kalou Fishpond and the surrounding marshy land, the site may be a minor feeding area for birds like the Hawaiian stilt (Himantopus n. knudseni), Hawaiian coot (Fulica americanus), and the Gallinule (Gallinula chloropus). However, none were seen during field trips. Also, the steeper areas of the site may nest some Hawaiian owl (Asio flammeus) though again none were sighted. The only wild mammal seen was the common mongoose (Herpestes auropunctatus), but the site probably contains feral cats and various species of mice and rats that are accessory to nearly all agricultural operations. Three sightings

were made of the Kamehameha Butterfly (Orthotylus sp.). The site does not seem to contain any representatives of flora or fauna on the endangered species list.

Historical Perspective of the Site

The major institutions on the site are the Waialee Livestock Research Center and the Crawford Convalescent Home. Both partially occupy lands that comprised the old Waialee Boys Home.

In 1864, the legislature of the Kingdom of Hawaii, passed an act authorizing the Board of Education to establish an industrial reformatory school for the care and education of helpless and neglected children and for the reformation of juvenile offenders. The first site selected was at Kapalama near the seaport town of Honolulu, where Kaiulani School now stands. In 1901, the Waialee site was chosen by the Department of Public Instruction and in 1903, the first building was completed and 75 boys were moved to Waialee. Activities included taro farming, auto mechanics, tailoring and woodshop. Many of these activities were housed in structures still found there today. The WLRC slaughterhouse was used as the woodshop and auto mechanics shop. The cafeteria and dormitories are now used as part of the Crawford Convalescent Home. In 1950, the entire population from Waialee (111 boys and 45 staff members) moved to the Hawaii Youth Correctional Facility (HYCF).

Crawford Convalescent Home originated in 1955 and is situated on 12.9 acres of State land. The Home's lease runs till the year 2021. The Convalescent Home is a private facility caring for the aged. Classified as an "intermediate care facility", the home has a capacity of 68 beds. Three major buildings constitute the Convalescent Home; two of which were kept from the Waialee Boys Home facilities. The building used as a

gym has been evaluated by the State Historic Preservation Office as having potentially great historic value due to its architecture and former institutional use.

Kalou Fishpond is a feature of cultural and historic value on the site. It was listed in the State Register of Historic Places but was recently dropped due to procedural errors in its initial placement. The pond is said to have been in its best condition when Kaluhi was Konohiki of the district. Reference to a Kane Stone in the vicinity of the pond-say that the pond was the point where Kahuku was attached to Waialee.*

Previous to the above institutional uses, the Waialee area had been a rural agricultural site with scattered residences like much of the north shore.

Historic Sites

Kalou Fishpond is Waialee's only structure or site formerly listed on the Hawaii Register of Historic Places. It is a spring fed pond which drains into the sea via a culvert through the sand dunes along the shore. It is an inland pond altered by man and covers approximately one acre. There is a retaining wall around the pond and fences around part of the perimeter. The pond was probably formerly used by the old Waialee Boys Home for its taro farming activities. It is currently used by the WLRC to irrigate pastures. The pond is in poor condition due to inadequate use and maintenance and is currently only a fraction of its former size. Parts of the northeastern section of the pond have been previously bulldozed and much of the pond has become overgrown. A flock of geese which feeds on the vegetation are kept at the site to prevent pondside weeds and vegetation from completely covering the pond.

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*Source: McCalisters Archaeology of Hawaii, 1934

Water use from the pond does not seem to be restricted. Minimal stabilization work will be considered to preserve the integrity of the fishpond.

A preliminary review by the Department of Land and Natural Resources' Historic Sites Division indicates that there are potentially two other sites of historical importance. The old dormitory building that is currently part of the Crawford Convalescent Home complex is probably of high historical value. It is a substantial building on the north shore built during the first 25 years of this century. It is also a fine example of neoclassical revival architecture typical of the period and has been used by the old Waialee Boys Home. Of possible marginal value is the "jail" building mauka of Kalou Fishpond just across the street from the entry to the convalescent home. It is currently used by the WLRC as a storehouse but its past use as part of the old boys home has not been determined. Both of the above sites will be investigated further before any action is taken to insure that nothing of historic value is unnecessarily lost.

Recreation

There are no public recreational facilities near the Waialee area and the nearest public toilet facilities are two miles away. The surfing area known as Velzyland is located on the Waimea end of the site. Public access to this area is through a single unimproved right-of-way. The recreational potential of the area has been recognized and the City and County's General Plan places the beachfront in recreational use. The City's Department of Parks and Recreation has indicated an interest in creating a regional park along the beach area. The State's Department of Land and Natural Resources has also mentioned the possibility of a 24 acre State park in the beach area. The WLRC's plans for expansion and

renovation will utilize the land interior of the beachfront strip that is of prime recreational value. There have been no recent discussions or funding for either the City or the State's park proposals. If these parks are developed there will be need for a security buffer between the WLRC and the parks. Whether the parks are developed or not, the proposed action for WLRC is not expected to conflict with either access or use of the beach area.

Tsunami

The shores of Waialee, like all of Oahu, have been affected by tsunami action in the past. These "seismic sea waves" are generated by sudden displacements of hugh masses of undersea rock and can originate from any point along the rim of the seismically active Pacific Basin.

Due to its location on the Island's north shore, Waialee experienced its most destructive tsunami from those originating from the Aleutian Islands. The 1946 and 1957 tsunami recorded run-ups of seven meters and six meters, respectively. (See Table 11).

TABLE 11

Tsunami Run-up (in meters)

For the 1946, 1952, 1957, 1960, 1964 Tsunami

Location	Latitude	Longitude	1946	1952	1957	1960	1964
Waialee	21°41.55'N	158°01.6'W	--	3.0	--	--	1.8
	21°41.05'N	158°02.25'W	--	--	--	2.4	1.8
	21°40.75'N	158°02.5'W	7.0	3.9	6.0	--	--

The periodic arrival of tsunami will continue, but it is unlikely that they will claim as many lives as they have in the past. Several

recording stations throughout the Pacific have been established by the U.S. Coast and Geodetic Survey. They form a tsunami warning system that has the capability of giving several hours advanced warning of waves with potential destructive energy. Therefore, people will be given ample time to evacuate the endangered areas. The existing reef structure fronting the shore will assist in dissipating the destructive energy of tsunami.

The U.S. Department of Housing and Urban Development, in conjuction with its National Flood Insurance Program have plotted a tsunami hazard area. This delineation indicates an area of potential danger due to tsunami action. (See Figure 14). Most of the facilities for the redeveloped WLRC have been sited mauka of Kamehameha Highway to minimize the risk of damage due to tsunami action.

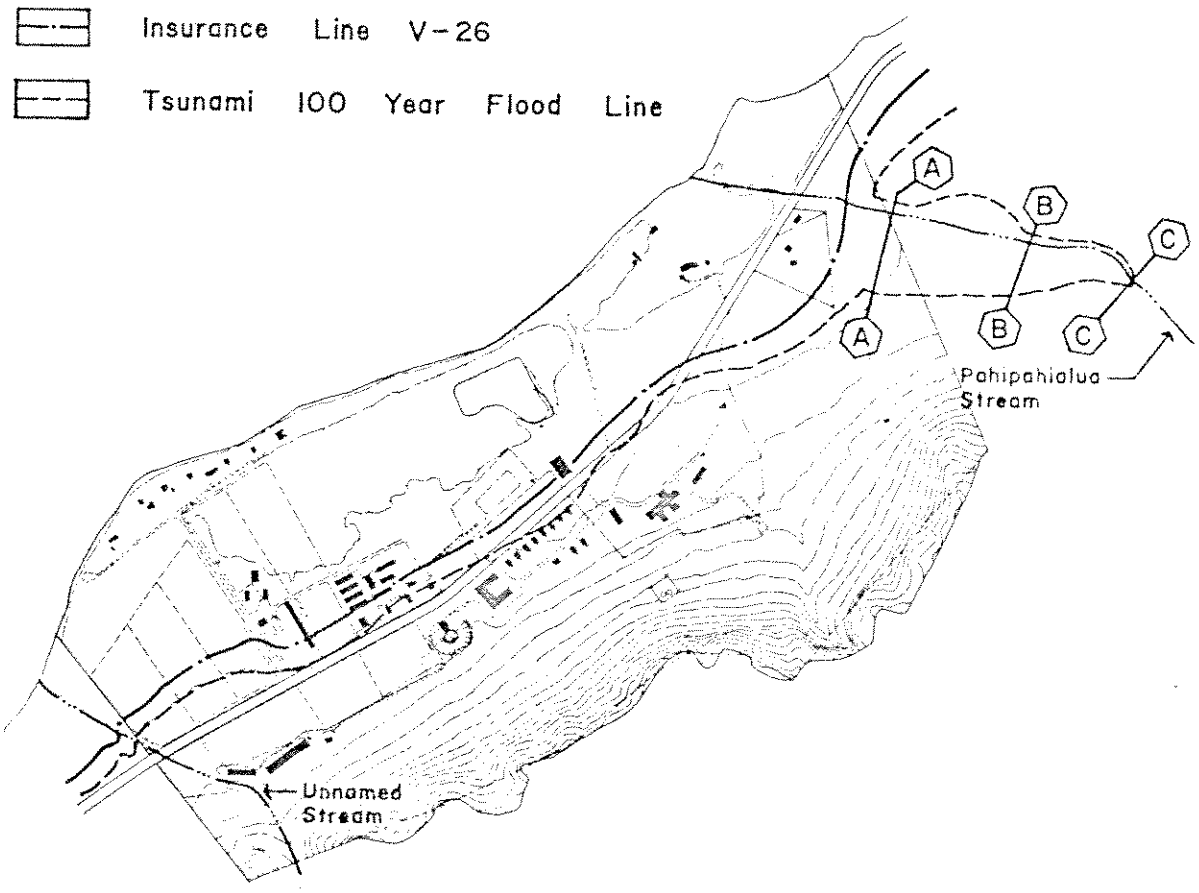
Drainage

None of the existing program units dispose sewage into any of the stream channels or ocean. Each facility has its own means of eliminating the effluent or wastewater. Kalou Fishpond drains directly into the sea through a culvert built through the dunes. There is a second culvert which drains the middle part of the makai pastures of storm water. During periods of high surf, these outlets sometimes become clogged and prevents drainage. The inadequacy of the drainage system on the site has made much of the makai pastures unusable for long periods.

The lower pastures adjacent to Kalou Fishpond are subject to seasonal saturation. During the dry season there is no problem with drainage or ponding and all the pastures are usable. However, with the arrival of the wet season, around November, increasing rainfall saturates the soil and the water table begins to rise. The acreage affected

FIGURE 14

HAZARDS



depends on the rainfalls, but conditions persist throughout the rainy season and do not disappear till the following April.

Plans for the WLRC call for zero or minimal drainage into the sea or stream channels. Attempts will be made to create a closed loop system for the water from the aquaculture ponds where water that goes through the system is re-circulated back into the system. Major water losses will be from evaporation and ground seepage. Design solutions are currently being developed to achieve this goal. Drainage plans for the seasonally boggy makai lands will also attempt to minimize discharge into the sea. Designs will attempt to channel water into retention channels or sumps from where it can be naturally discharged or pumped according to weather conditions. There may be some excess discharge during heavy storms and periods of prolonged rainfall.

Flooding

Flooding at Waialee is infrequent. This is due largely to the low rainfall at the site and the small drainage basins handled by the stream channels that cross the project area. Intermittent streams characterize the area and in periods of high or prolonged rainfall the stream channels, which are usually dry, fill up and carry the water to the sea. It is rare for these channels to overflow their banks. The small area of the drainage basins means a small watershed and less water for the stream channels to transport. Also, the Waialee site is well vegetated, which reduces erosion and allows the soil to absorb the water into the basal groundwater. The existing swale at the base of the cliffs also helps to minimize dangers from floods by redirecting waters into the natural stream channels.

Floods can also be the result of severe storm surf or tsunami.

Oahu's north shore is sometimes subject to giant storm waves generated by weather systems in the north Pacific. These waves are capable of flooding sizeable areas of the coastline. Tsunami in particular can be devastating. The Army Corps of Engineers have made the following calculations regarding the probabilities of floods of varying heights on the site. (See Table 11). Figure 14 delineates the demarcation lines for 100 year floods. The U.S. Department of Housing and Urban Development (HUD) has designated the coastal area of Waialee as Zone V26, on a scale of V1-30, and parts of the stream channels as Zone A, B, and C. (See Table 12).

TABLE 12

TIME PARAMETER	HEIGHT	DEFINITION
10 YEAR EVENT	3.5'	10% chance that for any given year, there will be flood that is equal or greater than 3.5'.
50 YEAR EVENT	13'	2% chance that for any given year, there will be flood that is equal or greater than 13'.
100 YEAR EVENT	17.5'	1% chance that for any given year, there will be flood that is equal or greater than 17.5'.

Emergency Service

Waialee is located in fire zone three, as defined in the Uniform Building Code (UBC). There are two fire stations in the area; one at Sunset Beach about two miles away and another at Kahuku Town about five miles away.

The nearest hospital and clinic are both in Kahuku Town about five miles away. Both services can reach the site within five to ten minutes.

TABLE 13

EXPLANATION OF ZONE DESIGNATIONS

Zone	
A	Area of 100-year flood; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
C	Areas of minimal flooding.
V1-V30*	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazards determined.

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* The numberals indicate the magnitude of difference between the 100-year and 10-year flood elevations. For numberals between 1-20, the difference is one half of the value; for values greater than 20, the difference is 10 less than the numberals shown. This information is used to establish rates.

Source: U.S. Department of Housing and Urban Development

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

The proposed action at Waialee conforms to the existing zoning and planned land uses in the area. It is also consonant with known plans and policies for the area. The land is zoned Agriculture One which allows all the current and proposed uses of the site. All the proposed renovations will conform to the zoning requirements. The agricultural uses of the site are consistent with the prevailing land use in the area. The break down of the land use for the area as shown in Figures 15 and 16 is as follows: Twenty percent agriculture, seventy percent vacant land, and ten percent urban. Seventy-five percent of the land is zoned for agriculture by the City and County. The State land use maps designate the entire site as agriculture.

The Hawaii State Plan calls for increased developing activities that provide greater efficiency and economic productivity in agriculture, the proposed action furthers the goals of the plan. The redevelopment calls for upgrading existing facilities and adding an aquaculture component to the WLRC. Furthering aquaculture is a specific goal of the State Plan.

The renovation and expansion of the WLRC is also consistent with the General Plan of the City and County of Honolulu. The General Plan encourages the growth of aquaculture and the diversification of Oahu's economic base. The Detailed Land Use Maps (DLUM) place most of the Waialee lands in agriculture, except for the beachfront which is designated recreation. The proposed Development Plans for Waialee also retain the predominance of agriculture in the area. The General Plan also seeks to "reduce or maintain the 1975 proportion of the Islands rural and urban-fringe population". It seeks to keep the Kahaluu to Kahuku

ZONING

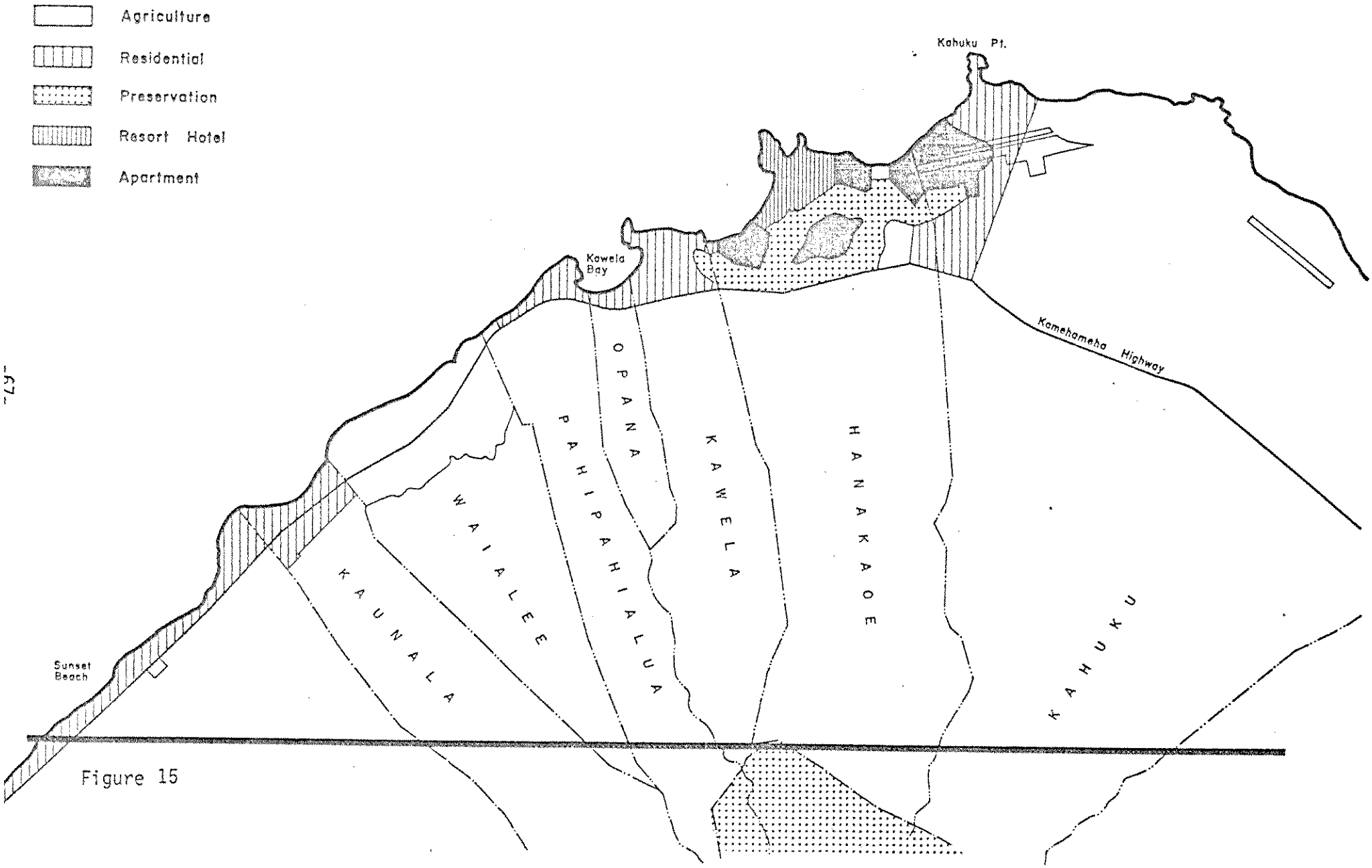


Figure 15

LAND USE MAP

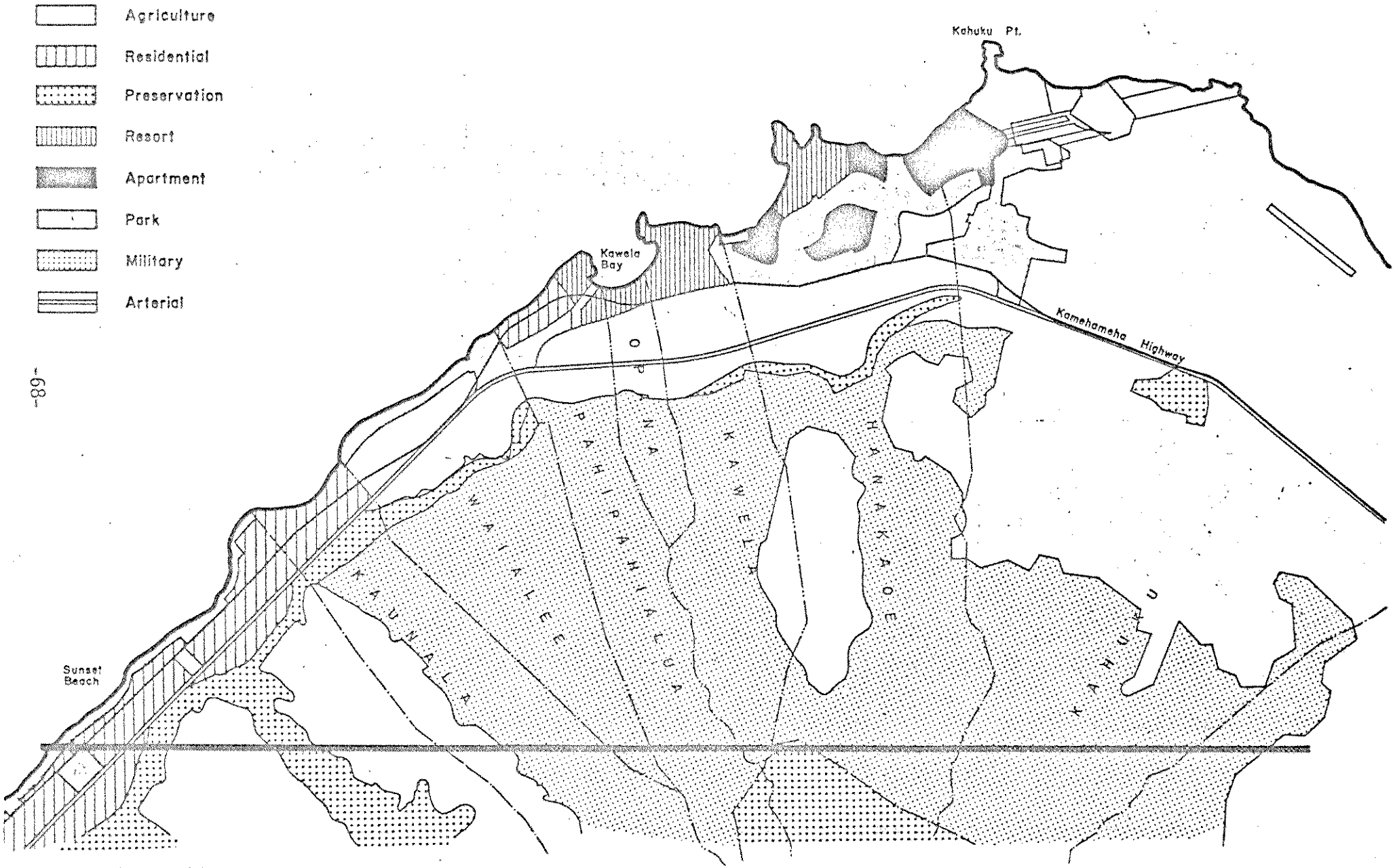


Figure 16

population proportion at 1.9% of the County's total by the year 2000. The current proportion is 2.1%. The WLRC action will have little or no impact on this distribution.

The Oahu Water Plan calls for more intensive development of the water resources in the Koolauloa District. There are four new wells proposed for the Kahuku area that projects a combined increase in capacity of 9.5 million gallons per day (mgd). This will be more than adequate to meet the increased capacity called for by the addition of the aquaculture unit. The WLRC also has the option of drilling a new well or uncapping an old well to meet the needs of the aquaculture program, but the advantages and disadvantages of tying into the municipal system or developing a separate well have not yet been fully evaluated.

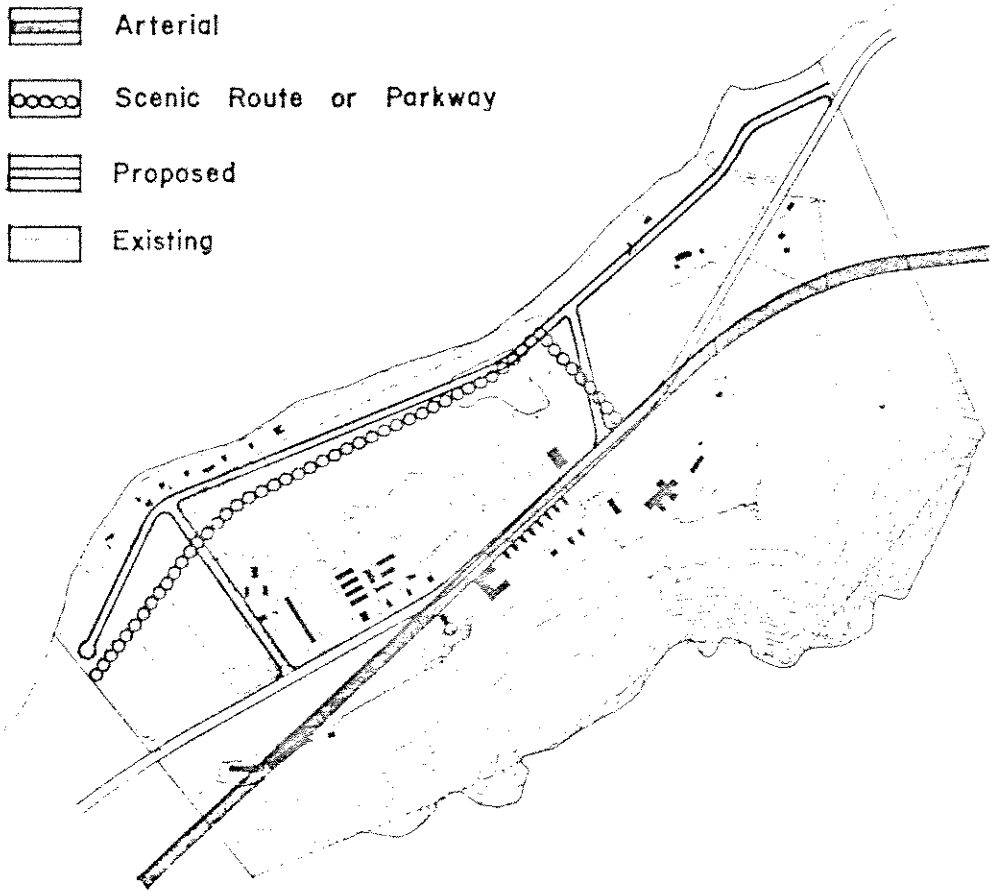
Part of the WLRC is within the boundaries of the Special Management Area (SMA). As such, the proposed action will conform to the requirements of the SMA constraints which protect viewsheds, recreational values and the general quality of the coastal zone.

The Detailed Land Use Maps (DLUM) show several plans for roadway changes on the site. Although the master plan and DLUM are in conflict, no problems are anticipated in implementing the master plan. This is based on the following considerations: (1) both the City and County's Department of Transportation Services and the State's Department of Transportation have indicated that they have no plans to implement the roadway changes and (2) previous City Corporation Counsel opinions that when there's a conflict between the DLUM and applicable zoning, the zoning prevails. (See Figure 17).

No major conflict is anticipated between the proposed action and other plans, uses, and policies for the Waialee area.

FIGURE 17

DLUM ROADWAY PLAN



VI. PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

Construction

Construction activity will have both a long and short term impact on the site. Short term impact will be from intrusive noises, dust, debris and exhaust fumes generated by equipment and activity. These noises will be generally of short duration and limited to the hours designated by the Community Noise Code for Oahu. Impact will be minimized by sound dampening devices and and appropriate wet down techniques to reduce dust from various grading and grubbing operations. Long term impacts will be in the use and configuration of the land. Scrub koa haole and assorted vegetation will be cleared and largely replaced with aquaculture ponds and pasture. New facilities will improve efficiency and safety on the site. Drainage of the makai marshy lands will increase the year round utility of these areas.

The construction of the aquaculture ponds will alter much of the vacant lands around Waialee. Lands currently covered with koa haole and other scrub vegetation will be cleared and then graded for pond construction. This may alter some of the drainage and absorption characteristic of the ground.

New roadways will constructed to meet the needs of the redeveloped and expanded WLRC. This will create new circulation patterns improving the movement of feed, animals and equipment on the site. It may also alter the surface drainage pattern somewhat, though this impact will probably not be significant.

Construction of the new facilities will expand the Center's research capabilities and will improve the work environment.

Relocation

Presently, two of the private parcels to be added to the WLRC are occupied. The acquisition of these parcels will result in the displacement of the occupants. To assist the occupants, relocation assistance will be provided to them according to applicable State laws. However, should Federal funds be involved in the acquisition of the parcels and/or improvements to be constructed on them, applicable Federal laws will be followed.

Also, should the State land occupied by the Crawford's Convalescent Home be added to the WLRC prior to termination of General Lease No. S-3983, relocation assistance will be provided to the Home according to applicable State laws. However, if Federal funds are involved in the improvements to be constructed, applicable Federal laws will be followed.

Traffic

There will be some increase in local and regional traffic due to the addition of the aquaculture program. The program will bring additional researchers, students, and interested observers to the WLRC. However, the amount of additional traffic generated will be minimal and largely conform to weekdays when it will not have a significant impact on the design capacity of Kamehameha Highway. Improvement of the entrances and exits from Kamehameha Highway should improve safety and increase circulation efficiency between the makai and mauka sections of the WLRC.

Utilization of Vacant and Marginal Lands

The proposed action will increase the acreage of the WLRC by expanding operations into marginal and vacant lands around the site. Some of the steeper talus slopes and cliff areas will be utilized as pasture while former cane land now overgrown with koa haole will be put into pond construction and pasturage. Proper management of pastures will prevent

erosion due to overgrazing. The proposed drainage of the makai wetlands around Kalou Fishpond will make year round use of these lands possible. In this redevelopment and expansion, consideration will be given to prevention of pollution and erosion due to surface run off.

Water Resources

The addition of the aquaculture program will increase the water needs of the WLRC. A rough estimate of the increase in demand is in the range of 1-2 mgd. This anticipated demand is not to be confused with expected daily use which will be significantly lower. This anticipated demand is based on a design goal which calls for the capacity to drain and refill 1/3rd of the ponds in one day. This peak load situation is what is anticipated to increase the demand by such a large amount. This increased demand on the capacity will push water needs for the WLRC beyond the area's current estimated capacity of 1.7 mgd: Sunset well 0.1 mgd, Waialee well No. 1, 0.5 mgd, Waialee well No. 2, 0.7 mgd, University of Hawaii well .4 mgd. Most probable options for meeting this demand are: uncapping an existing well, the development of the Board of Water Supply's Oahu Water Plan or the development of a new well on the WLRC site and the recycling of water.

Public Health and Well-Being

The redevelopment of the WLRC will have positive consequences on public health and well-being. The new facilities will reduce potential problems that may arise from disease vectors related to research activities. Improved waste handling will also contribute to better sanitation. The drainage of the makai wetlands will eliminate or minimize periods of flooding and prolonged standing water in these pastures. This will be beneficial since standing water is a breeding ground for mosquitos,

bacteria, and other pests. The periodic treatment that the Department of Health now provides mostly to control mosquitos will be unneccessary. The proposed drainage system along with the improved waste water disposal system will also make the land between the existing beef and poultry units usable.

The new facilities will improve the work environment for researchers, staff, and students.

Visual Quality

There may be some visual impacts as facilities are enlarged, new ones constructed, and vacant lands cleared. The design of the structures and the landscaping of the grounds will be consistent with the rural character of the area and the zoning regulations.

New Jobs

Redevelopment and expansion of the WLRC will generate some new jobs. Construction jobs will be created during the construction phase of the proposed action. On a longer term basis, there will be a slight increase in the WLRC staff.

Federal Funds

The expanded facility will probably help CTAHR attract Federal funds for research projects. The University of Hawaii is the only national land grant university in tropical agriculture, and this would be an advantage to particulary attract Title XII of the Food for Peace Act because the act specifically earmarks funds for tropical agriculture.

VII. ALTERNATIVES INCLUDING PROPOSED ACTION

A. No Action

The no action alternative was rejected, because it would not meet:

1. The University of Hawaii's College of Tropical Agriculture's goals and objectives to "contribute to the advancement of knowledge and the improvement of family and community life in the State by conducting research, development and educational programs in the areas of agricultural technology and products, and the development and effective use of natural and human resources.

2. The State of Hawaii's commitment to support development research and training in aquaculture.

Also, the no action alternative would result in the continued deterioration of the present facilities, some of which have been in existence prior to the 20 years the University has occupied the site and are in need of repair or replacement. A decline in research capability will result as the facilities become outdated. This will limit the usefulness of the WLRC as a research facility and the College of Tropical Agriculture and Human Resources will be without an adequate experimental facility for livestock research. This would be a severe handicap for the College. The loss of research capability would be contrary to the goals of the College to conduct research and develop effective uses of human and natural resources and to contribute to regional, national, and international needs in the fields of tropical agriculture and human resources.

B. Relocation

The relocation alternative was rejected for the following reasons:

a. The high cost of acquiring and developing a new site.

b. The time delays associated with the acquisition and development of a new site.

c. Operational problems due to facilities being split between two different locations during the interim when the existing facilities are being phased out and new facilities constructed.

C. Redevelopment Without Expansion

The redevelopment without expansion alternative was rejected because the existing WLRC site is too small to meet all the needs of the existing and proposed program units to be located at the WLRC. This lack of space would create many technical and program difficulties and serverly handicap the research capabilities of the WLRC.

D. Redevelopment With Expansion

The redevelopment with expansion alternative was considered the most appropriate course of action for meeting the needs of the existing and proposed program units to be located at the WLRC without reducing the quality and capacity of research at the WLRC. Within the redevelopment with expansion alternatives, two options were investigated. One option was to limit expansion to unencumbered State lands only. Under this option, the space requirements of the existing and proposed program units, were not fully met and location of the private parcels and leased State lands created siting problems. The second option was to permit expansion into not only unencumbered State lands, but also private parcels and leased State lands. In this option, the space requirements of the existing and proposed program units can be met and siting of the various facilities would be easier. According, the master plan for the WLRC was developed based on the second option.

VIII. THE RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF MAN'S ENVIRONMENT AND LONG TERM PRODUCTIVITY

The proposed action will use vacant lands and turn them into facilities for use by the WLRC. The major use will be in pasture and aquaculture ponds. Existing facilities will be upgraded and a dormitory and aquaculture labs will be added to the WLRC. The short term losses from this action will be the loss of marginal and vacant lands that are primarily covered with koa haole. These lands will be graded to accommodate their specific uses. In the sense that these lands will be used for relatively specific purposes, there will be some loss of long term productivity. However, since the land is zoned for agriculture, only other agricultural uses are being foreclosed. Secondly, pastures and ponds are easily convertible to other uses should future program changes require them. The loss in flexibility is small. Thirdly, any acquisition of private or leased lands will foreclose future tax revenues from these lands. In return, these vacant lands will be placed into institutional use and the WLRC will have an increased capability for research.

All construction activity will be performed according to appropriate codes and regulations. In some cases where existing facilities will be expanded there will be some long term negative visual impact. However, these impact will be minor and landscaping will mitigate most changes.

IX. MITIGATION MEASURES PROPOSED TO MINIMIZE IMPACTS

The obvious adverse impacts will be due to construction activity and of short term duration. Procedures to minimize these impacts will be followed. Construction activity will be limited to the hours specified in the "Community Noise Control for Oahu". Grading and grubbing will be performed in accordance with appropriate procedures established by the City and County's Department of Public Works. Soil dampening procedures will minimize the air pollution due to dust and debris. Properly muffled equipment will be used to lessen the level of intrusive sounds due to construction activity. Where necessary, measures such as temporary berms and incremental clearing of scrub lands will be implemented to prevent surface erosion. The swale at the base of the cliffs will be improved to increase its effectiveness to handle storm runoffs.

The long term impacts are less obvious but no less important. The major impacts will be the increased water consumption and the acquisition of private lands in the expansion of the WLRC.

Existing water sources are inadequate for the expansed WLRC plans. If these existing sources are overdrawn, water supply in the area may be permanently affected. In order to reduce the additional water demand resulting from the addition of the aquaculture unit, the use of brackish water for some of the ponds is being considered, and ponds will be sited on the proper soils in order to minimize water loss through ground seepage. The use of holding ponds for the re-use of fresh water discharge is planned as a measure for conserving water.

To prevent contamination of groundwater resources the use of cesspools will be discontinued. Studies by the firm of Sunn, Low, Tom and Hara, have shown that cesspools in the Waialee area have a propensity to fail.

Also, a well will be used to draw salt water for use in brackish and salt water experiments. Salt water from ground wells is clean and pure; its use minimizes the problems of contaminated salt water.

In the expansion of the WLRC, some private lands will be acquired. Site design will consider the impact of such acquisitions and minimize any unnecessary taking of private lands.

Some of the activities of the WLRC may be incompatible with the growing residential use of lands in neighboring Kawela and Sunset Beach. Increasing population pressures have resulted in an intensification of residential use in some of the areas. A buffer zone will be provided to avoid any possible conflicts that may arise between residential use and agricultural research use. Also, should a park be developed on the oceanfront properties, a security fence will be provided to separate WLRC uses from recreational activities.

Appropriate landscaping will be provided to mitigate any detrimental visual impacts that may occur.

X. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed redevelopment and expansion of the WLRC will utilize construction material, fuel, and manpower. State funds will be committed in the development and increased maintenance and operating expenses for the Center. The expansion of the WLRC will require State funds for the acquisition of private lands and will remove those lands permanently from the tax rolls. If the Center is discontinued in the future, the land would probably be committed to public uses rather than restored to its original state. The addition of the aquaculture unit will mean an increase in water consumption.

XI. INTERESTS AND CONSIDERATION OF GOVERNMENTAL POLICIES THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

The proposed action at Waialee supports the goals and purposes of the Hawaii State Plan, the General Plan of the City and County of Honolulu, the College of Tropical Agriculture and Human Resources and its research arm the Hawaii Institute of Tropical Agriculture and Human Resources.

The following policies of the State Plan are thought to offset the adverse effects: 1) promotion and development of diversified agriculture with special emphasis on aquaculture, 2) the preservation of prime agricultural lands, and 3) enhancing Hawaii's position as the research center of the Pacific. The increased research capability of the Center will aid the State's agricultural industry since much of the research at the Center is geared toward industry related problems. Putting the vacant lands into pond construction and pasturage will keep these lands in agricultural use. Finally, the proposed action will increase the research capability of the Center. This will enable the University to enter into a wider variety of research projects.

Policies of the City and County's General Plan supported by the proposed action are: 1) The push to developed diversified agriculture to broaden the County's economic base; special emphasis is also placed on aquaculture in the General Plan, 2) Preservation of prime agricultural lands, and 3) The stablization of population in the Waimea-Kahuku area. The first two are identical to the State policies. The third is supported by the WLRC plans because placing vacant land into productive agricultural and research use minimizes the lands that can be converted into higher density, commercial, and residential uses. This would tend to minimize activities that would attract residents to the area.

The proposed action will assist HITAHR and CTAHR in the pursuit of its goals to become a regional Pacific center for tropical agriculture. It will also help Hawaii's agricultural industry by allowing the center to expand its capacity for practical research in animal sciences. It will increase the expertise necessary for a viable industry. The Center will also be able to offer a greater variety of practical experiences and resources to students interested in pursueing careers in animal sciences.

XII. SUMMARY OF UNRESOLVED ISSUES

There are two major unresolved issues. The first is the question regarding the possible acquisition of lands and leases. The second is the question of an adequate water supply.

With reference to possible acquisition of private lots, kuleana, and leases; the timing is uncertain till funds are available. There are two types of costs that need to be addressed. First, there is the social and emotional cost involved in moving people off their lots, and second, the economic costs, which are threefold. First, there is the initial cost involving just compensation for the property. Second, there is the loss of tax revenues resulting from the transfer of private lands into public ownership. Finally, the costs of redeveloping and operating the facilities. In exchange the WLRC will have an improved and increased research capability.

The second major issue is the question of water resources. The proposed action will increase the water needs of the site beyond the capacity of existing facilities. The source of water to supply this increased demand needs to be determined. The resources are available, but the best option needs to be chosen.

XIII. LIST OF NECESSARY APPROVALS

The following is a preliminary list of necessary approvals required.

Approving/Issuing Agency	Purpose of Approval
U.S. Department of the Army	Storm Drainage Discharge into ocean
Department of Health	Waste Water Discharge Treatment Plant Approval Sanitation Regulation Conformance
Building Department	Building Code, Electrical Code and Plumbing Code Conformance
Board of Water Supply	Water System Plan Approval
Department of Land Utilization	Special Management Area Permit for development within the Special Management Area
UH Board of Regents	Master Plan Approval
Department of Transportation	Roadway Connection Construction and Traffic Control Plan

XIV. AGENCIES AND ORGANIZATIONS CONSULTED

Federal

U.S. Department of Army
Commanding General
U.S. Army Engineer District, Honolulu
Headquarters U.S. Army

U.S. Department of the Air Force

U.S. Department of Interior

U.S. Department of the Navy

U.S. Department of Agriculture
Soil Conservation Service

U.S. Department of Commerce
National Weather Service

State

Department of Agriculture

Department of Health

Department of Land and Natural Resources

Department of Planning and Economic Development

Department of Social Services and Housing

Department of Transportation

House Committee on Agriculture

House Committee on Higher Education

Senate Committee on Agriculture

Senate Committee on Economic Development

Senate Committee on Higher Education

Office of Environmental Quality Control

Environmental Quality Commission

City and County

Board of Water Supply

Department of General Planning

Department of Land Utilization

Department of Public Works

Department of Parks and Recreation

Department of Transportation Services

Koolauloa Neighborhood Board

Public Utilities

Hawaiian Electric Company

Hawaiian Telephone Company

Others

Crawford's Convalescent Home

50th State Dairy Farmer's Cooperative

Hawaii Beef Cattle Improvement Association

Hawaii Cattlemen's Council

Hawaii Pork Producers Association

Hawaii Farm Bureau Federation

Meadown Gold Dairies Farm

Meier's Dairy Farm

Hawaii Egg Producers Association

Hawaii Fryer Council

APPENDIX A

COMMENTS

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

PCDED PV

18 March 1980

Mr. Hideo Murakami, State Comptroller
Department of Accounting and General Services
Division of Public Works
P. O. Box 119
Honolulu, Hawaii 96810

A-1

Dear Mr. Murakami:

The U.S. Army Corps of Engineers has reviewed your Environmental Impact Statement (EIS) Preparation Notice for the Waialee Livestock Research Center, Oahu and offers the following comments for consideration during preparation of the EIS. We suggest you provide a clear description of the proposed action with a map of the proposed developments and include information on groundwater at the site. We suggest you show details of the pond and its drainage, and the species that would be cultured in the pond. We suggest you expand the discussions on how the completed project would enhance the area.

We believe that the State Division of Fish and Game records contain data on the use of Kalou fishpond by Koloa and Coot (both listed endangered species). We suggest that you consult with the EPA to determine whether the pond discharge will require a permit. We appreciate the opportunity to comment on this EIS Preparation Notice.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1441.0

APR 28 1980

Mr. Kisuk Cheong
Chief, Engineering Division
Department of the Army
U. S. Army Engineer District, Honolulu
Building 230
Ft. Shafter, Hawaii 96858

Dear Mr. Cheong:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

This is in response to your March 18, 1980 comments to the subject EIS Preparation Notice. Our responses are as follows:

1. General: The following items will be considered in preparing the EIS:

   a. A more complete description of the proposed action with a map of the proposed developments.

   b. Information on ground water at the site.

   c. Expanded description of how the project will enhance and impact the area.

2. Pond: We are currently working on pond construction, drainage and discharge plans. Attempts will be toward a closed loop system with no discharge during the normal course of operation. If discharge is necessary, a permit will be required.

3. Species: The species that will be cultured in the pond would probably change over a period of time and will be dependent on the research being conducted.

4. Endangered Species: Mr. Ron Walker of the State Division of Fish and Game has indicated that, although he suspects the Kalou Fishpond may be a feeding ground for the Coot, Gallinule and Stil, they have not made any sightings of these birds at the fishpond.

Thank you for your comments. If you have any further comments or questions, please call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

for RIKIO NISHIOKA
State Public Works Engineer

NS:ssk

A-2

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96853

12 MAR 1990

REPLY TO ATTN OF: DEEV (Mr Shiroma, 449-1831)

SUBJECT: EIS Preparation Notice, Waialee Livestock Research Center

TO: Department of Accounting and General Services
Division of Public Works
P. O. Box 119
Honolulu, Hawaii 96810

1. This office has reviewed the subject EIS Notice and has no comment to render relative to the proposed project.

2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document.

ROBERT Q. K. CHING
Chief, Engrg & Envmtl Plng Div
Directorate of Civil Engineering

RECEIVED
MAR 13 8 08 AM '90
ENV. ... DAGS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P. O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:
ES
Room 6307

March 10, 1980

Department of Accounting and
General Services
Division of Public Works
P.O. Box 119
Honolulu, Hawaii 96810

Re: EIS Preparation Notice
Waialee Livestock
Research Center

A-3

Dear Sir:

We have reviewed the referenced EIS preparation notice and offer the following comments.

The proposed action will have little, if any, adverse impact on plant and animal resources in the area. However we recommend that construction and destruction activities should be conducted so as to control erosion thereby minimizing impacts on wildlife resources in the area.

We appreciate this opportunity to comment.

Sincerely yours,

Thomas R. Halstead
for Maurice H. Taylor
Field Supervisor
Division of Ecological
Services

cc: NMFS
HDF&G
EPA, San Francisco

CONSERVE YOUR GAS ENERGY

Save Energy and You Serve America!

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1409.0

APR 10 [illegible]

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

Dear Mr. Taylor:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 10, 1980 response to the subject EIS preparation notice. Mitigation measures to minimize soil erosion will be included in the construction specifications for the various projects that will be constructed at the WLRC.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:ssk

United States Department of Agriculture

Soil Conservation Service

P. O. Box 50004
Honolulu, Hawaii
96850

March 6, 1980

Mr. Norman Sahara
Department of Accounting and
General Services
Division of Public Works
P. O. Box 119
Honolulu, Hawaii 96810

A-4

Dear Mr. Sahara:

Subject: EIS Preparation Notice
Waialee Livestock Research Center

We have reviewed the subject environmental impact statement preparation notice and have no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,

Jack P. Kanalz
State Conservationist

GEORGE R. ARIYOSHI
GOVERNOR

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

STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SOUTH KING STREET
HONOLULU, HAWAII 96814

March 20, 1980

MEMORANDUM

To: Department of Accounting and General Services
Division of Public Works

Subject: EIS Preparation Notice
Waialee Livestock Research Center

The Department of Agriculture has reviewed the subject preparation notice and strongly supports the redevelopment project.

In 1978, cash receipts from livestock marketing totaled $72.5 million. The continual basic and applied research are an essential and integral segment of maintaining a viable livestock industry.

Thank you for the opportunity to comment.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

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

GEORGE A. L. YUEN
DIRECTOR OF HEALTH

~~Audrey W. Mertz, M.D., M.P.H.~~
Deputy Director of Health

Henry N. Thompson, M.A.
Deputy Director of Health

James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

In reply, please refer to
File: EPHS - SS

March 11, 1980

Mr. Hideo Murakami, State Comptroller
Department of Accounting &
General Services
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Murakami:

Subject: Request for Comments on Proposed Environmental Impact Statement (EIS) for Waialee Livestock Research Center

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

We submit the following comments for your consideration and information:

1. Will the existing oxidation pond be enlarged or replaced by another (STP) system? Or will the increased sewage loads be served by the same system?

2. Will all the plumbing fixtures of the new structures be served by the oxidation ponds or will they be served by other means?

   Presently, cesspools are used to serve the three cottages and the poultry unit. These cesspools are not functioning satisfactorily.

3. Presumably, the aquaculture ponds will be located makai of the oxidation ponds. The risk of the aquaculture ponds becoming contaminated with sewage is great because of its close proximity. In addition, the oxidation pond may overflow during heavy rains.

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 A. A. Choy

for MELVIN K. KOIZUMI
Deputy Director for
Environmental Health

A-5

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE M. TOYOSAKI
DEPUTY COMPTROLLER

LETTER NO. (P)1434.0

APR 17 1980

Mr. Melvin Koizumi
Deputy Director for
Environmental Health
Department of Health
State of Hawaii
Honolulu, Hawaii

Dear Mr. Koizumi:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 11, 1980 comments to the subject EIS preparation notice. Our responses are as follows:

1. The proposed sewerage system for the WLRC will link all existing and new facilities.

2. Presently the following means of sewage disposal are being investigated:

   a. Expansion of the existing oxidation pond.

   b. Use of effluent for nutrient replacement on improved pastures.

   c. Use of effuent as nutrient source for acquaculture ponds.

   d. Use of a septic tank-leaching field combination for the irrigation of pastures.

   e. Development of a treatment plant system where waste water can be used for irrigation of pastures.

In all likelihood, a combination of the above will be implemented.

3. No aquaculture ponds are proposed to be located makai of the oxidation ponds.

If you have further comments or questions, please have your staff call Mr. Norman Sahara of the Division of Public Works at 548-7660.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

A-6

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

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

SUSUMU ONO, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

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

March 14, 1980

REF NO.: APO-1454

MEMORANDUM

TO: Honorable Hideo Murakami, State Comptroller
Department of Accounting and General Services

FROM: Susumu Ono, Chairman
Board of Land and Natural Resources

SUBJECT: Waialee Livestock Research Center (WLRC) EIS Preparation Notice

We have reviewed the EIS preparation notice for the WLRC.

The EIS should include a fuller description of the proposed action, in particular more specific information about expansion of the site.

SUSUMU ONO

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1398.0

APR 11 1980

Honorable Susumu Ono
Chairman
Department of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

A-7

Dear Mr. Ono:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for reviewing the subject EIS preparation notice. More details of the proposed action will be included in the Draft EIS.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKIFFINGTON
Deputy Director

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

March 4, 1980

Ref. No. 0782

The Honorable Hideo Murakami,
State Comptroller
Department of Accounting and
General Services
Division of Public Works
P.O. Box 119
Honolulu, Hawaii

Dear Mr. Murakami:

Subject: Environmental Impact Preparation Notice - Waialee
Livestock Research Center, Waialee, Oahu

The proposed action described in the subject document appears to be consistent with Part I, Section-7 of The Hawaii State Plan relating to objectives and policies for the economy in the area of agriculture. We concur in the initial assessment that the redevelopment and expansion of the facility will have a significant impact on the environment.

We have no other comments to offer at this time, but would appreciate the opportunity to review the Draft Environmental Impact Statement when completed.

Sincerely,

Hideto Kono

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

RYOKICHI HIGASHIONNA PH.D
DIRECTOR

DEPUTY DIRECTORS
JAMES R. CARRAS
JAMES B. McCORMICK
DOUGLAS S. SAKAMOTO
JACK K. SUWA

IN REPLY REFER TO

March 13, 1980

STP 8.6093

Department of Accounting and
General Services
Public Works Division
P. O. Box 119
Honolulu, Hawaii 96810

A-8

Gentlemen:

Subject: EIS Preparation Notice
Waialee Livestock Research Center

Thank you for giving us the opportunity to be consulted on the above-captioned action.

Please be informed that Kamehameha Highway along the North Shore is highly congested during the weekends. While the traffic volumes indicate the need for widening this facility, the Department has no plans for improvements at the present time. In this regard, we recommend that your permanent improvements for the Research Center should be located at least 50 feet away from our present highway right-of-way boundary (minimum requirement - 25 feet).

Very truly yours,

Ryokichi Higashionna

Ryokichi Higashionna
Director of Transportation

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE M. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO (P)1401.

APR 11 1980

Honorable Ryokichi Higashionna
Director
Department of Transportation
State of Hawaii
Honolulu, Hawaii

Dear Dr. Higashionna:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 13, 1980 comments regarding the subject EIS preparation notice. Your recommendation to locate permanent improvements at least 50 feet from the present highway right-of-way boundary has been considered in the development of the master plan of the WLRC.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

GEORGE R. ARIYOSHI
GOVERNOR

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DIV. OF ... WORKS
DAGS

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

RICHARD O'CONNELL
DIRECTOR

TELEPHONE NO.
548-6915

March 25, 1980

MEMORANDUM

TO: Mr. Hideo Murakami, Comptroller
Department of Accounting and General Services

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

SUBJECT: Environmental Impact Statement Preparation Notice for
Waialee Livestock Research Center

A-9

We have reviewed the subject document and offer the following comments for your consideration in preparing the EIS:

Proposed Action

The project description should include a detailed discussion of what the redevelopment of WLRC involves. How much additional area will be required? Where will the expansion occur? In addition to aquaculture development will other programs or facilities be added to the expanded research center. Will additional personnel be required? When will redevelopment occur? How long will it take?

Land Use

The impact of expansion on adjacent land uses should be discussed in the EIS.

Water Supply

How much additional water will be required? Can this requirement be met by the existing system?

Power and Communication

Power and communication are sufficient to supply immediate needs. Will they also be sufficient to supply any additional requirements due to expansion? How much additional energy will be required?

Ground Water

The EIS should discuss the impact of the current sewage disposal system on groundwater quality. Will increased sewage lead to a degradation of the existing water supply?

Sewage Disposal

Will the current disposal system be able to accommodate additional waste that may be generated by expansion? How will waste handling be improved?

Odor and Vector Problems

The EIS should discuss existing and future odor and pest problems and means of minimizing and/or eliminating these problems.

Traffic

Increased traffic congestion both during and after construction and its impact on air quality should be discussed.

We thank you for the opportunity to provide this input to the EIS preparation.

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1535.0

MAY 16 1980

Mr. Richard L. O'Connell
Director
Office of Environmental Quality
Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

A-10

Dear Mr. O'Connell:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 25, 1980 comments to the subject EIS preparation notice. Our responses are as follows:

1. Proposed Action

   a. A detailed description of the proposed action will be included in the EIS.

   b. The WLRC is proposed to be expanded by approximately 95 acres.

   c. Expansion will be toward Kahuku.

   d. The new program units to be added are aquaculture and health management.

   e. Additional personnel will be required for the expanded and renovated WLRC.

   f. The initial phase will involve the construction of some aquaculture ponds and support structures. This initial phase is expected to start in late 1980 or early 1981.

   g. No specific timetable has been established for the redevelopment and expansion of the WLRC because it will be dependent upon the availability of design and construction funds.

2. Land Use

   The impact of the proposed action on adjacent land uses will be discussed in the EIS.

3. Water Supply

   The expected increase in water demand is between 0.5 to 1 million gallons of water per day. This estimate is based on peak demand. The existing systems of the Board of Water Supply's and the University's do not appear capable of handling the increased demand. An expansion of the University's system should provide the required water supply. To conserve water, recycling of the water used for the aquaculture ponds is being considered.

4. Power and Communications

   Future power and communications requirements are being determined. Information regarding these requirements and the facilities needed to meet the requirements will be included in the EIS.

5. Ground Water

   An expanded discussion on water quality will be included in the EIS. Although the proposed action will increase the amount of sewage generated, appropriate sewage and waste disposal improvements will be constructed so that a degradation of water sources will not occur.

6. Sewage Disposal

   The existing disposal system will not be able to accommodate the additional waste that will be generated. Presently, the following means of sewage disposal are being investigated:

   a. Expansion of the existing oxidation pond.

   b. Use of effluent for nutrient replacement on improved pastures.

   c. Use of effluent as nutrient source for aquaculture ponds.

d. Use of a septic tank-leaching field combination for irrigation of pastures.

e. Development of a treatment plant system where waste water can be used for irrigation of pastures.

In all likelihood, a combination of the above will be implemented.

7. Odor and Vector Problems

Odor is a minor but unavoidable problem associated with agricultural operations. Accordingly, a buffer zone will be maintained between odor generating facilities and residential areas. Also, odors will be controlled through operational procedures. There are no real vector problems at the WLRC, except for the breeding of mosquitos in the lower makai pastures. This problem can be solved with the installation of an adequate drainage system for the pastures.

8. Traffic

The traffic impact of the proposed action will not be significant. The increase in traffic generated by users of the WLRC will be small and largely confined to weekdays when the level of traffic is well below the design capacity of Kamehameha Highway. Also, construction generated traffic will be small and temporary in nature. Therefore, the traffic generated by the proposed action will not have a significant impact on air quality.

If you have further comments or questions, please have your staff call Mr. Norman Sahara of the Division of Public Works at 548-7660.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

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

March 11, 1980

Mr. Hideo Murakami
Comptroller
Department of Accounting
and General Services
Division of Public Works
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Murakami:

Subject: Your Letter of February 26, 1980, Requesting Comments on the EIS Preparation Notice for the Waialee Livestock Research Center

We have the following comments on your proposed project:

1. A water master plan, including the additional demand, should be submitted to us.

2. Our water service limit is up to the 106-foot elevation.

3. The amount of water needed and the source of water for the proposed aquaculture research should be addressed. Also, the breakdown of all water demands should be included in the EIS.

4. Preliminary construction plans should be submitted for our review of water requirements.

Should you have questions or require additional information, please call Lawrence Whang at 548-5221.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO (P)1397.0

APR 10 1980

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Hayashida:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

A-12

This is in response to your March 11, 1980 comments to the subject EIS preparation notice. Our responses are as follows:

1. A water master plan is being prepared and will be submitted to you.

2. The water service limit is being considered in our planning effort.

3. A breakdown of water demands will be provided in the Draft EIS.

4. As improvements are implemented, the preliminary construction plans will be submitted to your office for review of the water requirements.

Thank you for your comments. If you have further comments or questions, please have your staff call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:jm

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

GEORGE S. MORIMOTO
DIRECTOR AND CHIEF PLANNING OFFICER

DGP2/80-559(CT)

March 6, 1980

Mr. Hideo Murakami, State Comptroller
Department of Accounting and
General Services
P. O. Box 119
Honolulu, Hawaii 96810

Attention: Division of Public Works

Dear Mr. Murakami:

EIS Preparation Notice of Waialee Livestock Research Center, Undated--Comments Requested February 26, 1980
DAGS Ref. No. (P)1192.0

We offer the following comments.

The proposed action is not clear.

The summary sheet (p. i) indicates that the proposed action is to prepare the master plan for the redevelopment of the research center.

The preparation notice itself indicates that the action proposed is the redevelopment of the research center (p. 1).

In the first case, an environmental impact statement is not required.

In the second case, implementation of the plan, i.e., the actual redevelopment of the center, does require an impact statement. In this case, the list of impacts, particularly the long-range impacts (pp. 6-7), to be discussed should be expanded to include such things as odor, drainage, impact on substandard Kamehameha Highway from increased truck and automobile traffic generated by the expanded center.

The planning effort should provide the information for the impact statement.

Thank you for affording us the opportunity of reviewing the preparation notice.

Sincerely,

GEORGE S. MORIGUCHI
Chief Planning Officer

CSM:fmt

A-13

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119 HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO (P)1422.0

APR 14 1980

Mr. George S. Moriguchi
Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Moriguchi:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 6, 1980 response to the subject EIS preparation notice. The proposed action is the redevelopment and expansion of the WLRC. The Draft EIS will include a more detailed description of the proposed action and an expanded discussion of its impacts.

If you have further comments or questions, please have your staff contact Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:ssk

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

FRANK F. FASI
MAYOR

TYRONE T. KUSAO
DIRECTOR

LU2/80-896(SM,
80/EC-5

March 10, 1980

Department of Accounting
and General Services
Division of Public Works
State of Hawaii
Honolulu, Hawaii

Gentlemen:

EIS Preparation Notice
Waialee Livestock Research Center
Waialee, Koolauloa District, Oahu
Tax Map Key 5-8-01: 6, 7, 13, 55

We have reviewed the above and have the following comments to offer:

1. There should be a more detailed account of proposed project including:

   a. An accurate site plan of new construction, i.e., location of new structures, phasing, etc.;

   b. Timetable for construction;

   c. Cost of construction and source of funds; and

   d. Plans for land acquisition and expansion.

2. How will the increase in sewage generation affect the sewage disposal system and the near-shore water quality? What is the existing near-shore water quality?

3. Will there be an increase in vehicular traffic as a result of the proposed project? If so, this topic should be addressed in a comprehensive fashion.

4. Any new habitable areas will be subject to the tsunami inundation heights set forth by the Flood Insurance Rate Maps for Oahu (National Flood Insurance Program).

5. The proposed project site is also subject to the rules and regulations of Ordinance No. 4529 for the Special Management Area

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

Very truly yours,

TYRONE T. KUSAO
Director of Land Utilization

TTK:ey

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1421.0

APR 14 1980

Mr. Tyrone T. Kusao, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Kusao:

A-15

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 10, 1980 comments to the subject EIS preparation notices. Our responses are as follows:

1. Detailed Information: Detailed information regarding the proposed action will be contained in the Draft EIS.

2. Sewage: The effect of increased sewage generation on the sewage disposal system is presently being investigated and will be discussed in the Draft EIS. Since no sewage discharge into the ocean is anticipated, there should be no impact on near-shore water quality due to sewage discharge. The Department of Health has declared the near-shore waters as Class A.

3. Traffic: The proposed action will not cause a significant increase in vehicular traffic.

4. Tsunami Inundation: No new habitable structures are proposed to be constructed in the tsunami inundation zone.

5. SMA: All SMA requirements will be met.

If you have further comments or questions, please have your staff call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:ssk

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 80-64

March 4, 1980

Division of Public Works
Department of Accounting and
General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Gentlemen:

Subject: EIS Preparation Notice, Waialee
Livestock Research Center

We have reviewed the EIS preparation notice for the subject project and have the following comments.

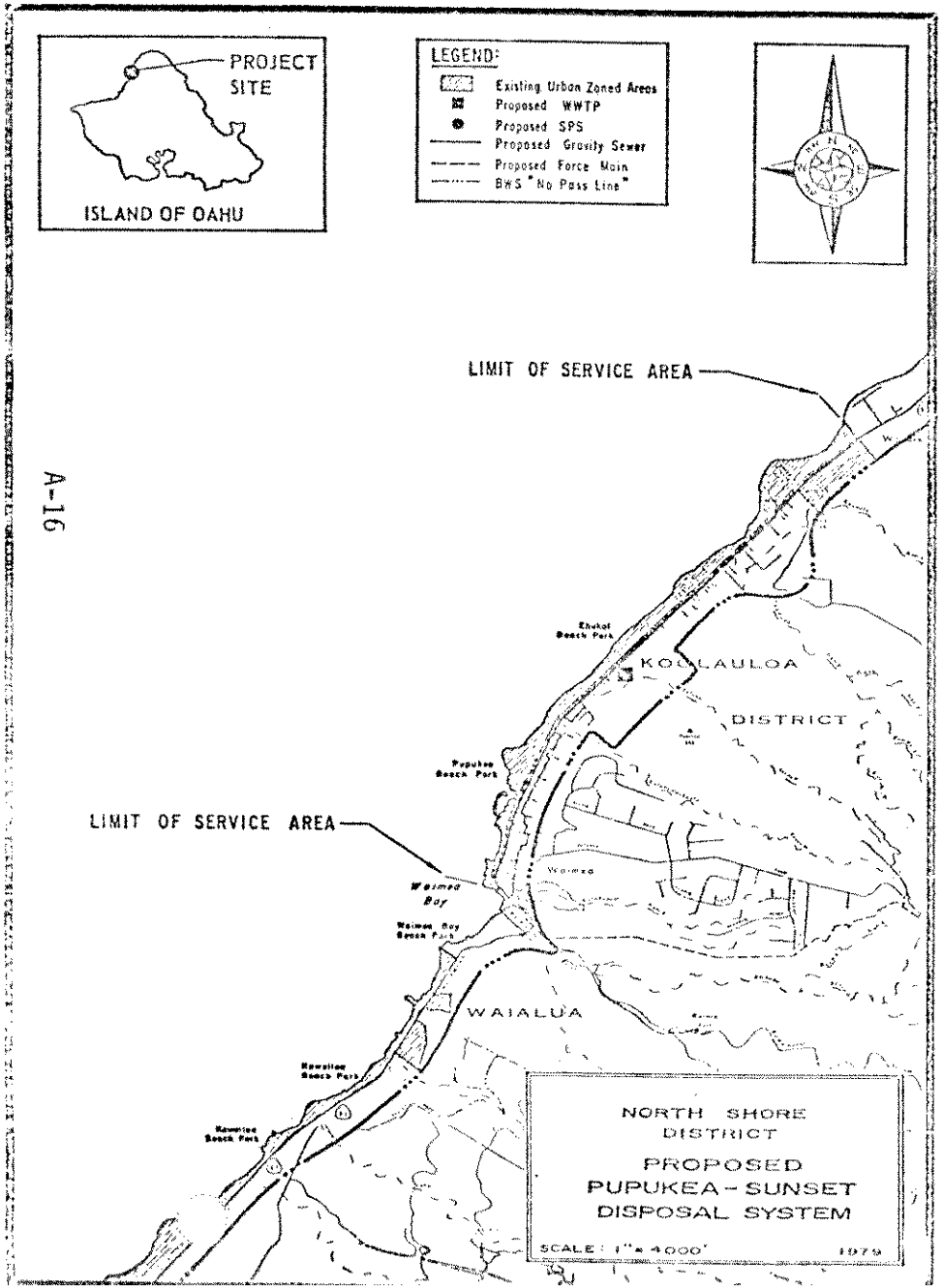
1. There are no existing municipal sewers near the project site. The service area of the future Pupukea-Sunset disposal system will extend to the Haleiwa boundary of the project site as shown in the attached plan.

2. The preparation notice mentioned the addition of aquacultural facilities at the project site. Is there a possibility that treated wastewater effluent can be reused in the future for these facilities?

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

Attach.



A-16

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE M. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1467.0

APR 23 1980

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Miyahira:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 4, 1980 response to the subject preparation notice informing us: (1) that there are no existing municipal sewers near the WLRC and (2) that the future Pupukea-Sunset disposal system will extend to the Haleiwa boundary of the WLRC. However, we understand that no definite timetable has been set for implementation of the Pupukea-Sunset system.

Although it is anticipated that research into the use of treated wastewater effluent for acquaculture production will be conducted at the WLRC, it is not anticipated that treated wastewater will be used as a water source for the acquaculture ponds.

If you have further comments or questions, please have your staff call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

for RIKIO NISHIOKA
State Public Works Engineer

NS:jm

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RAMON DURAN
DIRECTOR

March 27, 1980

Mr. Hideo Murakami, State Comptroller
Department of Accounting and
General Services
P. O. Box 119
Honolulu, Hawaii 96810

A-17

Attention: Division of Public Works

Dear Mr. Murakami:

SUBJECT: EIS PREPARATION NOTICE FOR
WAIALEE LIVESTOCK RESEARCH CENTER

Our only comment regarding your EIS preparation notice is to request that the sawtooth edge of the seaward boundary of the lower pastures be eliminated to allow road setback and free movement parallel to the shoreline between the WLRC boundary and the existing kuleanas. This would also more closely approximate the General Plan configuration for the future Waialee Beach Park.

We have drawn on the attached site plan the proposed change in the northwest boundary. If there are further questions, you may call Donald Griffin at 523-4521.

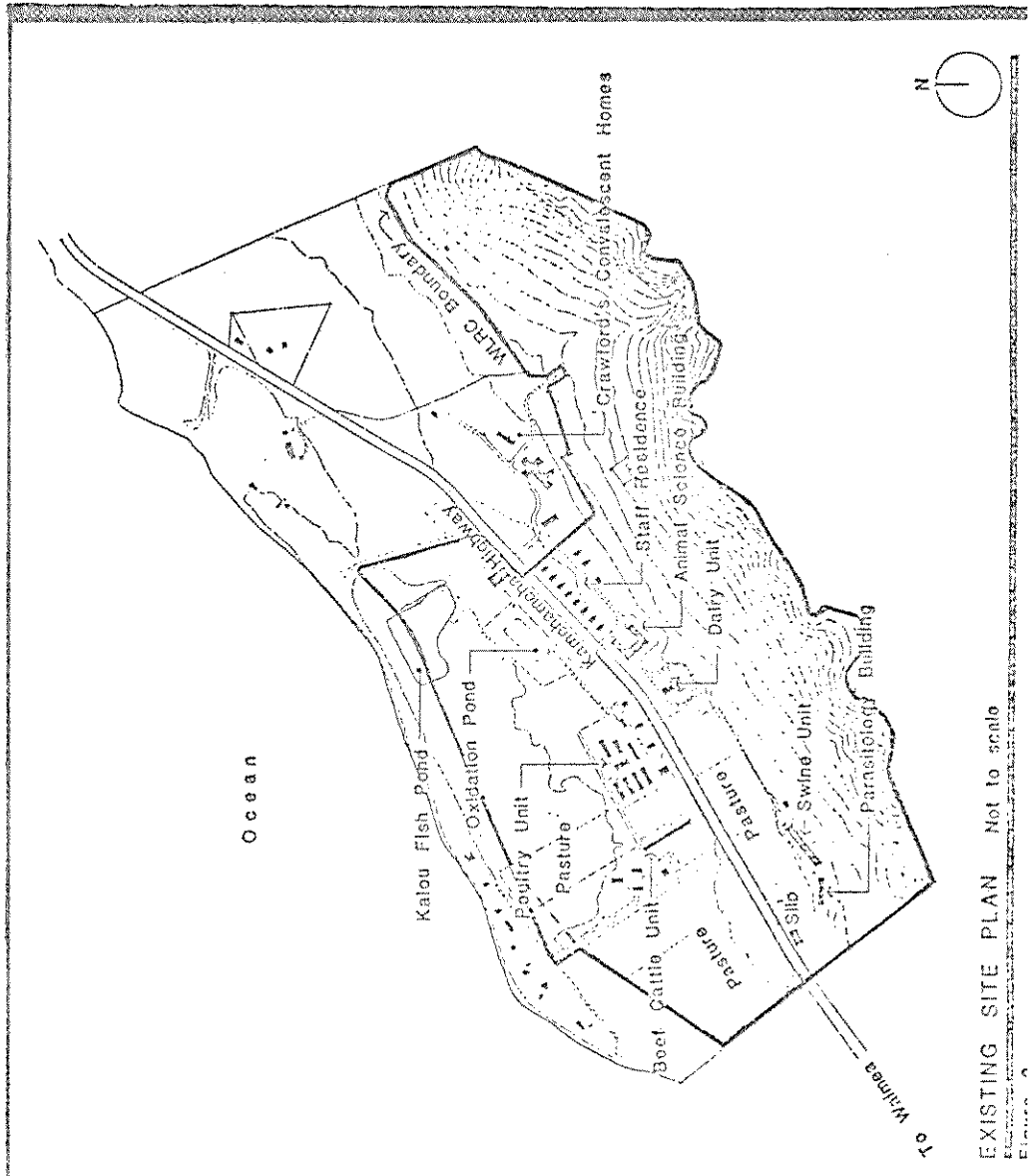
Warm regards.

Sincerely,

RAMON DURAN, Director

RD:sn

Attach.



EXISTING SITE PLAN Not to scale

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1517.0

MAY 13 1980

Mr. Ramon Duran
Director
Department of Parks and
Recreation
City & County of Honolulu
Honolulu, Hawaii

Dear Mr. Duran:

A-18

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 27, 1980 comments on the subject preparation notice. We would like to note that the "sawtooth" edge of the seaward boundary is presently part of the WLRC and that additional land will have to be added for the WLRC to meet its projected land requirements. Accordingly, this portion of the boundary will be left as is for the master plan. In determining the new boundaries for the WLRC, consideration was given to permitting access to the beach front and kuleanas from Kamehameha Highway and movement parallel to the shoreline. However, adjustments of the boundary can be discussed with the University of Hawaii when the future Waialee Beach Park is developed.

If there are any questions, please have your staff call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:jm

cc: Mr. H. Mogi, Planning & Research, Inc.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

TE2/80-

March 20, 1980

Mr. Hideo Murakami, State Comptroller
State of Hawaii
Department of Accounting and
and General Services
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Murakami:

Subject: Your Letter Dated February 26, 1980 Regarding E.I.S. Preparation Notice for Waialee Livestock Research Center (REF: (P) 1192.0)

The E.I.S. for the project should include a study of vehicular access to the site from Kamehameha Highway. The need for turning lines on Kamehameha Highway should be checked out with the State Department of Transportation, which has jurisdiction over this section.

We also take this opportunity to inform you that City bus service is available on Route 52 on Kamehameha Highway with thirty-minute headways in each direction.

Very truly yours,

AKIRA FUJITA
Acting Director

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO (P)1399.0

APR 10 1980

Mr. Akira Fujita, Acting Director
Department of Transportation Services
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Fujita:

A-19

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 20, 1980 comments on the subject preparation notice.

The traffic impact of the proposed action will be described more completely in the Draft EIS. The City bus service information you have provided us will be included in the Draft EIS.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:jm

HAWAIIAN ELECTRIC COMPANY, INC.
Box 2750 / Honolulu, Hawaii / 96840

March 18, 1980

JOHN C. McCAIN, Ph.D.
MANAGER, ENVIRONMENTAL DEPARTMENT

ENV 2-1
NV/G

Department of Accounting and
General Services
Division of Public Works
P. O. Box 119
Honolulu, Hawaii 96810

Dear Sirs:

Subject: EIS Preparation Notice - Waialee Livestock Research Center

Several members of the staff of Hawaiian Electric Company have reviewed the EIS preparation notice for the Waialee Livestock Research Center and offer the following comments for your consideration:

1. Our distribution circuit along Kamehameha Highway should not be affected by changes to the Waialee Livestock Research Center since there is no mention of any need for highway realignment.

2. Hawaiian Electric Company has a segment of the Waimea to Kahuku 46 kv transmission circuit which traverses the mauka portion of the property as indicated on the attached sketch. The original alignment of this circuit was covered by General Lease No. I-1756 dated June 21, 1921. When we slightly realigned the circuit in 1974 and 1975, the State Department of Land and Natural Resources approved the realignment and provided a right of entry. The documentation process for a perpetual easement is still underway with various State agencies including the University of Hawaii (see attached documents). We believe, therefore, that the costs of any relocation of our Waimea to Kahuku 46 kv circuit made necessary by the proposed project should be borne by the University of Hawaii and that the EIS should mention this fact.

Yours truly,

John C. McCain

JCMc:cm
Enclosure

GEORGE R. AR YOSHI
GOVERNOR

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)1396.0

APR 10 1980

Dr. John C. McCain
Hawaiian Electric Company, Inc.
Box 2750
Honolulu, Hawaii 96840

Dear Dr. McCain:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

Thank you for your March 18, 1980 comments to the subject EIS preparation notice. Development of the WLRC will not require relocation of your 46 kv circuit. However, as requested, it will be mentioned in the EIS that should development of the WLRC require relocating the 46 kv circuit, the relocation costs should be borne by the State.

If you have any further comments or questions, please call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

NS:kew

A-20

913 Halekauwila St.
Honolulu, HI 96814
April 6, 1980

Dept. of Accounting and General Services
Division of Public Works
P.O. Box 119
Honolulu, HI 96810

Dear Sirs:

I have reviewed the "Waialee Livestock Research Center EIS Preparation Notice" and offer the following comments:

The section on the probable impact of the proposed action on the environment should include a discussion on the cruelty aspects of modern factory farming if any projects at the facility will encourage or support such practices. This should include a statement on each questionable practice, including, but not limited to, overcrowding, close confinement, de-beaking, tail docking, stress, boredom, forced moulting, castration, branding, mother deprivation, roughage deprivation in feedlots, and iron and light deprivation in veal calves.

The probable impact of the proposed project in supporting or expanding public consumption of meat should be addressed. Livestock feeding wastes a gigantic amount of food that could be used to fight hunger throughout the world. An analysis should be included which addresses the ethics of exacerbating this problem by supporting the local meat industry. It should be stated whether an enlarged meat industry will increase, decrease, or have no effect on Hawaii's self-sufficiency.

The alternatives section should deal with the option of channeling research and energy to more resource-efficient food production systems than the meat industry.

The section on short and long term uses of the environment should include a discussion on the relative efficiencies of maintaining a population that directly consumes grains and a system that uses grain to raise livestock.

The section on mitigation measures should include a section stating which individual(s), group(s), or agency(s) will be responsible for oversight of agricultural and experimental practices to insure that cruel practices are not used. To have any usefulness, this body must have representation from parties other than researchers involved in the agriculture industry and veterinarians who have a vested interest in the agriculture industry. It is suggested that scientists who do not experiment on animals be included as well as representatives from concerned animal welfare organizations.

Sincerely,

Kelley Dobbs

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1635.0

Mr. Kelley Dobbs
913 Halekauwila Street
Honolulu, Hawaii 96814

Dear Mr. Dobbs:

Subject: EIS Preparation Notice
Waialee Livestock Research Center (WLRC)

A-21

In response to the concerns expressed in your April 6, 1980 letter regarding the subject project, we provide the following comments:

Cruelty Aspects:

Methods of operations and treatment of animals are items investigated at the Center. However, the EIS is a disclosure document presenting the environmental impact of the proposed redevelopment and expansion of the WLRC. As such, the ethical questions regarding cruelty to animals in modern livestock production methods are beyond the scope of this EIS. Please note that livestock research may be able to eliminate the practices you mentioned.

Meat Consumption:

Public consumption of meat is primarily a function of economics and pricing in relation to other food products. Since livestock research increases food production and/or reduces the cost of production, its long-term effect is to increase public consumption of meat provided there is consumer acceptance. Please note that (1) livestock research is already being conducted at the Center and that the proposed expansion is basically for aquaculture research and (2) the University has 14 Agricultural Experiment Stations engaged in research related to grains, vegetables, fruit and other non-livestock items.

World Hunger:

The matter of world hunger is beyond the scope of this EIS. However, we would like to point out:

(1) that unless dietary habits change drastically, consumer choices will dictate that the meat industry remain a significant feature in the State, National and world food production systems.

(2) that research such as that conducted at the Center, was one item that enabled America to produce more food than it needed, and thereby assist in fighting hunger throughout the world.

(3) that even if meat consumption were halted, we do not believe the assumption that the food used to feed livestock would automatically be used to fight hunger throughout the world.

Hawaii's Self-Sufficiency:

Strengthening the local livestock industry contributes to increasing self-sufficiency for the State because the local industry presently supplies only a fraction of the total demand in the Islands. Assistance to the industry is aimed primarily at making local products competitive with mainland and foreign suppliers in order that they may capture a larger share of an existing local market. This increases the State's self-sufficiency by making us less dependent on outside sources.

Channeling Research:

Since the WLRC implements one of the programs of the University of Hawaii, the option of channeling research into other areas is beyond the scope of this EIS. However, as mentioned earlier, 14 of Hawaii's 15 Agricultural Experiment Stations engage in research related to grains, vegetables, fruit, and other non-livestock items.

Research Control:

Formation of an oversight body to judge livestock practices just for the WLRC seems unnecessary, since there are organizations such as the Hawaiian Humane Society already in existence to handle the cruelty to animals issue.
Thank you for your comments.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

D'95 - 23